Title: Neighborhood crime, deprivation and preterm birth

BACKGROUND

 Preterm birth is an important public health concern. Preterm birth, generally defined as birth at less than 37 weeks completed gestation (1), is the single most important cause of perinatal mortality in North America and Europe (1), is the leading cause of death for black infants (2, 3) and contributes substantially to perinatal and infant morbidity (1, 4). Most cases of preterm birth occur without a known cause (1, 5). Predictors of preterm birth include: prior preterm delivery, multiple gestations (1, 6), low prepregnancy weight (7-9), tobacco use and bacterial vaginosis (6, 10). Markers for preterm birth risk include: black race, single marital status and low socioeconomic status, among others (1, 11-14). Researchers estimate that 25-30% of preterm births in developed countries can be explained by known risk factors (5).

 Disparities in all perinatal outcomes, including preterm birth, exist. One of the most highly predictive markers for adverse birth outcomes in this county is black race. In the United States, significant excesses in rates of infant mortality, very low birth weight, and preterm birth exist among African American, compared with white, women. Almost two-thirds of the black-white difference in infant mortality and 84% of the black-white gap in neonatal mortality were due to higher rates of very low birth weight among black infants (15). In 2002, 17.7% of black infants were preterm compared with 11.0% of white infants (16). While this black-white disparity in preterm birth has decreased in recent years, the decrease is largely due to an increase in preterm delivery among white women and a small decrease in the preterm delivery rate in black women (17). Research indicates that protective factors such as college education, good health and access to quality prenatal care do not provide the same level of protection against adverse birth outcomes for African American women as for white women. Black and white women at comparable high levels of education (i.e., college and beyond) have a larger gap in rate of adverse birth outcome than comparable women at lower educational levels (18-20). Similarly, moving out of poverty to increased income does not provide the same reduction in low birth weight for African American women as for white women (21). The disparity in adverse birth outcomes between black and white women cannot be explained by individual socioeconomic factors. The relatively small

proportion of explained preterm birth variation has encouraged recent attention to neighborhood level influences (22).

Neighborhood effects, including those associated with neighborhood deprivation, are of increasing interest in public health and perinatal research. Neighborhood socio-economic disparities in key pregnancy indicators represent the most widely observed neighborhood effect in the perinatal literature (5, 23-25). Lower birth weights have been associated with higher rates of neighborhood poverty (26-28), unemployment (28), lower educational and income levels (26, 28, 29), higher median rent (26), and higher rates of violent crime (30). The neighborhood effects literature has demonstrated consistent but fairly small effects of neighborhood environments. Differences in neighborhood level exposures may account for some proportion of the disparity between black and white women's low birth weight rates.

Crime is an important feature of the neighborhood environment that can influence health outcomes. The literature suggests neighborhood-level fear of crime may contribute to an underlying mechanism explaining area differences in health (31-33). Fear of crime has been directly associated with poor health outcomes in several studies (34-36), even after adjusting for health behaviors and a number of individual and household level socioeconomic factors (32). Women tend to be more fearful of crime than men, which may make neighborhood level crime particularly important for maternal health (37). Violent crime environments have previously been associated with adverse pregnancy outcomes after controlling for individual covariates (30, 38). Morenoff (2003) also found a significant relationship between violent crime and birth weight, but the association is attenuated following control by individual covariates (39). The relationship of neighborhood violence and birth outcomes appears meaningful and may help explain the disparity in birth outcomes between white and black women.

Research on neighborhood effects has been largely limited to socioeconomic context. This research sought to enlarge the consideration of neighborhood influences by answering the following questions: 1) Do black and white women differ in their neighborhood crime and deprivation context? 2) Are these differences in crime and deprivation associated with preterm birth among these women?

METHODS

Data Sources. These data came from the North Carolina Birth Outcomes Partnership Project (NC-BOP), part of a HRSA/MCHB project funded to study contextual level influences on risk of preterm birth in four urban areas in the United States. The birth outcome and individual women's characteristics came from three consecutive years of North Carolina Birth Records (years 1999-2001) for Wake County NC. Wake County houses 627,846 people and is home to the NC state capital, Raleigh. The Wake County birth record file contained 30,481 births for the three years. The individual births were geocoded with latitude and longitude values using Geographic Data Technology (GDT) and were assigned to year 2000 US census block groups. Of the 98.6% of birth files with complete addresses sent to GDT for geocoding, 93.2% achieved an exact census tract match using GDT's methods. The North Carolina birth records contain standardized information on each woman including details about her birth outcome (gestational age, birth weight, singleton status), her personal characteristics (race/ethnicity, age, education, marital status) and her health behaviors (smoking, drinking, number of prenatal visits). We used these records to create the outcomes and covariates for this analysis.

The second data source was City of Raleigh crime data for the years 1999-2001. The crime report data were geo-coded and assigned a crime category and severity rating based on methods outlined in the literature (40). Over 126,000 crimes were categorized using this method. Crime categories include: homicides, assaults and threats, sexual assaults, crimes against nature, kidnapping, larceny, robbery, burglary, fraud, arson, trespassing, disorderly conduct, perjury, weapons offense, prostitution, obscenity, gambling, drug, and motor vehicle offense (i.e., DWI). The crime types were grouped into the following larger categories—total crimes (includes all crime categories), violent crime (homicide, assault, sexual assault, kidnapping), theft crime (larceny, robbery, burglary, fraud), property crime (arson, trespassing, disorderly conduct), and vice crimes (prostitution, obscenity, gambling, drug). The five main crime categories were aggregated to produce block group counts by crime type using 2000 US Census boundaries.

The third data source was year 2000 census, from which the deprivation score, a neighborhood control variable, was derived. The deprivation score is a single summary representing six socioeconomic

domains including variables representing poverty, housing, employment, occupation, education and racial heterogeneity. Principal components analysis was used to produce the deprivation index. Ten variables emerged as one component representing neighborhood deprivation and accounting for over 68% of the variability at the block group level. We merged the census block group level deprivation score, which characterizes women's neighborhood socioeconomic status, with their birth records.

Neighborhood definition. Neighborhood is a term loosely used to refer to a person's immediate residential environment, which is hypothesized to have both material and social characteristics related to health (41). The reported research considered census block groups to approximate the neighborhood environment. Census block groups are nested with census tracts and generally contain between 600-3000 people with an optimal size of 1500 [http://www.census.gov/geo/www/reference.html, (42)]. On average Wake County block groups are larger than the optimal size and contain 2276 persons (sd=1675). This level of aggregation is large enough to contain women who delivered during the study years, but small enough to approximate the immediate physical neighborhood for our study subjects. Previous research has argued for the smallest level of aggregation possible in measuring observed disorder, owing to the considerable variability block-to-block within larger ecological units (43, 44). While not an ideal measure of 'neighborhood', the census block group is the unit of analysis for this work.

Study Outcome. The study outcome for this paper was preterm birth among the cohort of singleton births. The birth cohort for this analysis was limited to singleton births for two reasons: One, the etiology of preterm birth is different for singletons versus multiple gestations. And two, while increasing in prevalence, the occurrence of natural multiples is still relatively rare and the reasons that women may use reproductive technologies to assist in becoming pregnant, one significant cause of non-singleton pregnancies, may be the same factors that put women at higher risk of adverse birth outcomes, thereby confounding the relationship between multiple births and adverse birth outcomes like preterm birth. Preterm birth is defined as gestational age less than 37 weeks (and birth weight less than 3888g) and was constructed using the clinical gestational age variable found in the birth records. In the study population represented by this vital

records cohort, 26,823 (88%) of the singleton births were term, 2378 (8%) were preterm and 703 (2%) were very preterm.

Neighborhood Exposure. The study sample for this paper was limited to women who resided in the City of Raleigh police reporting area and were therefore eligible for 'exposure' to the neighborhood level crime (N=14,758). Wake County comprises 263 block groups of which 131 represent the City of Raleigh study area. The neighborhood exposure variables include block group counts of violent, theft, property and vice crimes. Quartiles of block group crime variables were used for these analyses. These analyses will also consider block group crime density or rate variables, in which the block group crime counts will divided by the block group population to account for population density differences between the geographies. These analyses are not reflected in this draft of the paper.

Covariates. Individual covariates included in adjusted models include maternal race, maternal age, maternal education and marital status. These individual-level variables are established risk factors for preterm birth and possible confounders to the neighborhood crime environment-preterm birth relationship. The neighborhood covariate was a neighborhood deprivation score used to control for differing levels of block group disadvantage or affluence. The deprivation score is standardized; a low deprivation score (-3.0) indicates lack of deprivation or affluence whereas a high score (+12.2) suggests a high amount of deprivation. An additional covariate this paper will consider adjusting for is the location of police substations within the block group. This covariate is not included in this draft of the paper, but will be in the final version. Adjustment for confounders was made when the crude risk ratio differed from the adjusted for each confounder by 10% or more (45).

Data Analysis. Analyses were stratified by white non-Hispanic and black non-Hispanic race because of anticipated heterogeneities in the social and neighborhood processes resulting in preterm birth. Logistic regression analysis produced odds ratios (OR) and 95% confidence intervals (CI) for level one (individual level) models. Future analyses will consider the associations between the level two variables (block group crime and deprivation) using logistic regression. Multilevel analyses were conducted to explore the contribution of the neighborhood environment (level two

variables) over that of the individual level predictors and to account for any clustering of the birth outcomes. We estimated random effects logistic models with a fixed slope value for each predictor variable but with randomly distributed tract-specific intercepts and adjusted the models for maternal age, education, and marital status. All analyses were conducted in Stata 8.2.

RESULTS

Of the three-year study cohort, 14,758 women (50.3% of the 29340 geocoded records) fell into the 1999-2001 crime report area. The sample description is found in Table 1. White non-Hispanic women had the largest absolute number of term and preterm births (6744 [52.0%] and 483 [39.3%], respectively), but black women had almost twice the rate of preterm births compared with white non-Hispanic women (547 [12.8% preterm, compared with 6.7% preterm]). The distribution of maternal age and education was relatively equal among women delivering term and preterm with most mothers delivering at being between 25-34 years of age and having completed more than 12 years of education. Less than 30% of the women who delivered term were unmarried, compared with almost 42% delivering preterm. Block group level neighborhood deprivation was differentially distributed between term and preterm births. The mean deprivation value was significantly higher among women delivering preterm compared with those delivering term. The fewest number of women delivering term resided in block groups with very high levels of deprivation (20.2%) but this percent was considerably higher for women delivering preterm (26.5%). Quartiles of block group violent crime followed pattern similar to deprivation; generally, the more violent crime, the larger the proportion of preterm birth. Violent crime also demonstrates a possible threshold effect, with roughly 7% of preterm births occurring in the low and medium quartiles then jumping to 9.0 and 10.8% in the upper two quartiles. Quartiles of block group theft crime were fairly consistently distributed between the term and preterm birth outcomes, but women delivering preterm still had a higher average number of theft crimes per block group than those delivering term (198.8 versus 182.8). Block group property crime is also consistent between term and preterm births until the very high level, at which point preterm births are much more represented than term births (37.0 versus 32.4%). Similarly, term births occur to women

who reside largely in tracts with low levels of block group vice crime (32.5%) while preterm births mostly reside in block groups with very high levels of vice crime (34.1%).

Table 2 addresses the question of comparability of black non-Hispanic and white non-Hispanic women's neighborhoods. Considerable differences are apparent between the two groups of women, both in terms of individual characteristics like marital status and their maternal age distribution, but most especially regarding neighborhood level variables. The bulk of white non-Hispanic women live in block groups with the lowest neighborhood deprivation quartile, 40.3%, compared with the roughly equal proportion of black non-Hispanic women who live in block groups in the highest quartiles of deprivation (42.2%). Black non-Hispanic women live in block groups with over twice the mean number of violent crimes compared with the resident block groups for white non-Hispanic women (27.1 versus 68.1); almost half of the black non-Hispanic women represented by this sample of Raleigh women live in block groups with the highest quartiles of violent crime counts. The pattern is similar for all the crime types; as the count of crime increases, and as block groups move from the lower to the upper quartiles, the proportion of white non-Hispanic women decreases and the proportion of black non-Hispanic women increases. It appears from these results that black and white non-Hispanic women live in very different neighborhood environments as defined by neighborhood deprivation and crime count.

The race-stratified unadjusted associations of both individual level and neighborhood level variables with preterm birth are in Table 3. For black non-Hispanic women, older age puts one at increased odds of preterm birth (Odds Ratio [OR]: 1.6, 95% Confidence Interval [95%CI] = 1.1, 2.3) while increased levels of education (high school completion and beyond) statistically significantly reduces odds of preterm birth (OR= 0.8 [95% CI: 0.6, 1.0] and OR= 0.7 [95% CI: 0.5, 0.9], respectively). For both white and black non-Hispanic women, not being married appears to be a risk factor for preterm birth, conveying a 50% and 30% increased odds for whites and blacks, respectively. High and very high levels of neighborhood deprivation are also associated with increased odds of preterm birth in unadjusted models for both white non-Hispanic (OR=1.2 [95% CI: 1.0, 1.6] and OR=1.5 [95% CI: 1.0, 2.3]) and black non-Hispanic (OR=2.1 [95% CI: 1.4, 3.2] and OR=1.7 [95% CI: 1.2, 2.6]) women. Black non-Hispanic women residing in block groups characterized by high and very high levels of violent crime appear at increased odds for preterm birth (OR=1.5 [95% CI: 1.1, 2.2] and

OR=1.4 [95% CI: 1.0, 2.0]) in this sample. The relationship is similar for white non-Hispanic women, but does not achieve statistical significance in unadjusted models. Contrary to expectation, black non-Hispanic women residing in tracts with medium, compared with low levels of block group theft crime have increased odds of preterm birth (OR=1.6 [95% CI: 1.1, 2.3]), but less so as women reside in block groups characterized by more theft crime, where the odds of preterm birth decreases to 40% and 20% for high and very high levels of theft crime, respectively. Further, this relationship is different for white non-Hispanic women for whom residing in a block group with any level of theft, property or vice crime appears inconsequential. Neighborhood property crime does not appear to confer meaningful risk for black non-Hispanic women, but medium, high and very high levels of block group vice crime is associated with approximately 30% increased odds of preterm birth among these women, although only the very high level of vice crime achieves statistical significance at the 0.05 level (OR= 1.3; 95% CI: 1.0, 1.7]).

This final version of this paper will discuss the nature of the association between the level two neighborhood variables in detail – specifically how neighborhood deprivation and block group crime are associated, and if differentially associated in neighborhoods where predominantly white non-Hispanic versus black non-Hispanic women live. If the location of police substations proves to be an important confounder between the crime count / density and preterm birth relationship, substation location will be included in the level two variable discussion.

The crime model results adjusted for individual and neighborhood covariates are in Table 4. The minimum number of white non-Hispanic women per block group in these multilevel models was 1, the mean number of white non-Hispanic women per block group was 55.9, and the maximum number of white non-Hispanic women per block group was 599. White non-Hispanic women resided in 129 of the sample's block groups. Black non-Hispanic women represented in these multilevel models lived in 117 block groups; their minimum number per block group was 1, the mean number per block group was 36.5, and the maximum number per block group was 167. The intra-class correlation coefficient, an indicator of clustering of the preterm birth by census tract was essentially 0 for both white non-Hispanic and black non-Hispanic women. The adjusted models portray an almost identical picture of the crime – preterm birth relationship for both black non-Hispanic and white non-Hispanic women as that demonstrated by the unadjusted models. The

adjusted relationship is attenuated slightly by controlling for individual covariates and neighborhood deprivation, but the nature and direction of the associations remain the same. For white non-Hispanic women, living in block groups with different levels of crime does not appear to increase the odds of delivering preterm; the ORs remains approximately 1.0 and none of the relationships are statistically significant. Among black non-Hispanic women, however, different levels of crime appear to produce slightly different odds of preterm birth. Specifically, living in a block group with high levels of violent crime (OR=1.4; 95% CI: 1.0, 2.0) and medium levels of theft crime (OR=1.5; 95% CI: 1.0, 2.1) increases the odds of preterm delivery in this sample.

DISCUSSION

Multilevel analyses were conducted to determine the contribution block group level crime (violent, theft, property, and vice) made to the disparity in preterm birth experiences of black and white non-Hispanic women. The analyses suggested white and black non-Hispanic women live in dramatically different neighborhood environments, as approximated by block group deprivation and crime counts. These neighborhood differences may suggest differential exposure to neighborhood stressors or adverse events, which in turn may predispose certain women to increased risk of preterm birth. The neighborhood level crime variables demonstrated a small to modest association with preterm birth odds, after adjusting for individual and neighborhood level covariates in these analyses, particularly for black non-Hispanic women.

The neighborhoods in which women live, work and gestate are a probable source of both support and stress. These neighborhood influences, which arise from political, economic and racial structures (such as racism), may reasonably affect birth outcomes. Work in this area is relatively new and underdeveloped and while the results of this study are not as pronounced as one might expect, they represent an important step forward in understanding the role the neighborhood environment may play in adverse birth outcomes, such as preterm birth.

Ties to existing research, study strengths and limitations, and implications for policy and future research will be discussed in the final version of this paper.

TABLE 1. Distribution of individual covariates and neighborhood attributes by birth outcome status among sample living within city of Raleigh crime area (1999-2001).			
(column percent)	TERM N (%)	PRETERM N (%)	% PRETERM
Maternal Race	12,988	1232	
White Non-Hispanic	6744 (52.0)	483 (39.3)	6.7%
Black Non-Hispanic	3720 (28.7)	547 (44.5)	12.8%
Hispanic	1921 (14.8)	157 (12.8)	7.6%
Other	594 (4.6)	43 (3.5)	6.8%
Marital Status			
Married	9174 (70.6)	717 (58.2)	7.3
Not Married	3814 (29.4)	515 (41.8)	11.9
Maternal Age			
Continuous Age Range; mean (sd)	13-52; 28.4 (5.9)	13-49; 28.1 (6.2)	
<20 years	975 (7.5)	105 (8.5)	9.7%
20-24 years	2630 (20.3)	275 (22.3)	9.5%
25-29 years	3561 (27.4)	339 (27.5)	8.7%
30-34 years	3750 (29.9)	301 (24.4)	7.4%
35+ years	2072 (16.0)	212 (17.2)	9.3%
Maternal Education			
Continuous Education Range; mean (sd)	0-17; 13.6 (3.2)	0-17; 13.3 (2.9)	
< 12 years	2238 (17.3)	259 (21.2)	10.4
12 years	2481 (19.3)	296 (24.2)	10.7
> 12 years	8237 (63.6)	669 (54.7)	7.5
Neighborhood Deprivation			
Continuous Deprivation Range; mean (sd)	-3.5 – 12.5; 0.29 (2.3)	-3.5 – 12.5; 0.78 (2.6)	
Low (-3.5 - -1.1)	3401 (26.2)	233 (18.9)	6.4%
Medium (-1.12 - -0.25)	4073 (31.4)	339 (27.5)	7.7%
High (-0.26 – 1.6)	2887 (22.2)	334 (27.1)	10.4%
Very High (1.61 – 12.5)	2627 (20.2)	326 (26.5)	11.0%

TABLE 1, continued.			
(column percent)	TERM N (%)	PRETERM N (%)	% PRETERM
Neighborhood Violent Crime			
Continuous Violent Crime Range; mean (sd)	0-378; 45.8 (48.5)	0-378; 53.1 (49.9)	
Low (0 - 7)	2941 (22.6)	222 (18.0)	7.0%
Medium (8 - 21)	2645 (20.4)	201 (16.3)	7.1%
High (22 - 56)	3881 (29.9)	383 (31.1)	9.0%
Very High (60 - 378)	3521 (27.1)	426 (34.6)	10.8%
Neighborhood Theft Crime			
Continuous Theft Crime Range; mean (sd)	0-1452; 182.8(193.6)	0-1452; 198.8(197.9)	
Low (0 - 43)	3264 (25.1)	265 (21.5)	7.5%
Medium (45 - 105)	2105 (16.2)	189 (15.3)	8.2%
High (106 – 193)	3624 (27.9)	360 (29.2)	9.0%
Very High (194 - 1452)	3995 (30.8)	418 (33.9)	9.5%
Neighborhood Property Crime			
Continuous Property Crime Range; mean (sd)	0-222; 36.4 (33.7)	0-222; 38.9 (33.3)	
Low (0 - 12)	3380 (26.0)	288 (23.4)	7.9%
Medium (13 – 22)	2277 (17.5)	185 (15.0)	7.5%
High (25 - 40)	3122 (24.0)	303 (24.6)	8.9%
Very High (42 - 222)	4209 (32.4)	456 (37.0)	9.8%
Neighborhood Vice Crime			
Continuous Vice Crime Range; mean (sd)	0-537; 25.4 (47.6)	0-537; 31.0 (51.8)	
Low (0 - 3)	4222 (32.5)	323 (26.2)	7.1%
Medium (4 - 8)	2672 (20.6)	237 (19.2)	8.2%
High (9 - 26)	2592 (20.0)	252 (20.5)	8.9%
Very High (30 - 357)	3502 (27.0)	420 (34.1)	10.7%

	White non-Hispanic	Black non-Hispanic	% White non-Hisp.	% Black non-Hisp.
TABLE 2. Distribution of individual covariates and neighborhood attributes by race among sample living within city of Raleigh crime area (1999-2001).				
(column percent)	N (%)	N (%)		
Marital Status				
Married	6793 (89.7)	1833 (41.4)	78.8%	21.3%
Not Married	777 (10.3)	2593 (58.6)	23.1%	76.9%
Maternal Age				
Continuous Age Range; mean (sd)	14 – 52 30.5 (5.2)	13 – 45 26.4 (6.1)		
< 20 years	217 (2.9)	561 (12.7)	27.9%	72.1%
20-24 years	788 (10.4)	1358 (30.7)	36.7%	63.3%
25-29 years	2033 (26.9)	1164 (26.3)	63.6%	36.4%
30-34 years	2877 (38.1)	829 (18.7)	77.7%	22.3%
35+ years	1645 (21.7)	514 (11.6)	76.2%	23.8%
Maternal Education				
Continuous Ed Range; mean (sd)	2 – 17 15.1 (2.0)	0 – 17 13.2 (2.3)		
< 12 years	314 (4.2)	809 (18.3)	28.0%	72.0%
12 years	950 (12.6)	1363 (30.9)	41.1%	58.9%
> 12 years	6289 (83.3)	2240 (50.8)	73.7%	26.3%
Neighborhood Deprivation				
Continuous Depriv Range; mean (sd)	-3.5 – 12.5 -0.7 (1.3)	-2.8 – 12.5 1.8 (3.0)		
Low	3050 (40.3)	433 (9.8)	87.6%	12.4%
Medium	2919 (38.6)	967 (21.9)	75.1%	25.9%
High	1243 (16.4)	1159 (26.2)	51.8%	48.3%
Very High	358 (4.7)	1867 (42.2)	16.1%	83.9%

TABLE 2, continued.				
(column percent)	White non-Hispanic	Black non-Hispanic	% White non-Hisp.	% Black non-Hisp.
	N (%)	N (%)		
Neighborhood Violent Crime				
Continuous Violent Range; mean (sd)	0 – 378 27.1 (35.8)	0 – 378 68.1 (53.1)		
Low	2583 (34.1)	433 (10.0)	85.4%	14.6%
Medium	1951 (25.8)	597 (13.5)	76.6%	23.4%
High	2284 (30.2)	1195 (27.0)	65.7%	34.4%
Very High	752 (9.9)	2191 (49.5)	25.6%	74.5%
Neighborhood Theft Crime				
Continuous Theft Range; mean (sd)	0 – 1452 135.9(165.3)	0 – 1452 221.4(205.6)		
Low	2691 (35.6)	636 (14.4)	80.9%	19.1%
Medium	1442 (19.1)	594 (13.4)	70.8%	29.2%
High	1873 (24.7)	1526 (34.5)	55.1%	44.9%
Very High	1564 (20.7)	1670 (37.7)	48.4%	51.6%
Neighborhood Property Crime				
Continuous Prop Range; mean (sd)	0 – 222 27.5 (28.4)	0 – 222 44.3 (34.5)		
Low	2587 (34.2)	793 (17.9)	76.5%	23.5%
Medium	1734 (22.9)	494 (11.2)	77.8%	22.2%
High	1774 (23.4)	1161 (26.2)	60.4%	39.6%
Very High	1475 (19.5)	1978 (44.7)	42.7%	57.3%
Neighborhood Vice Crime				
Continuous Vice Range; mean (sd)	0 – 537 12.7 (35.4)	0 – 537 42.1 (58.8)		
Low	3499 (46.2)	745 (16.8)	82.5%	17.6%
Medium	1877 (24.8)	688 (15.5)	73.2%	26.8%
High	1269 (16.8)	951 (21.5)	57.2%	42.8%
Very High	925 (12.2)	2042 (46.1)	31.2%	68.8%

TABLE 3: Unadjusted Odds Ratios [95% CI] for preterm birth among sample living in City of Raleigh crime area (1999-2001.		White Non-Hispanic Women	Black Non-Hispanic Women
		OR [95% CI]	OR [95% CI]
Marital Status			
	Married	Referent	Referent
	Not Married	1.5 [1.1, 1.9]	1.3 [1.1, 1.6]
Maternal Age			
	<20 years	Referent	Referent
	20-24 years	1.0 [0.6, 1.7]	1.1 [0.8,1.5]
	25-29 years	1.0 [0.6, 1.6]	1.1 [0.8, 1.5]
	30-34 years	0.7 [0.4, 1.2]	1.3 [0.9, 1.8]
	35+ years	0.8 [0.5, 1.4]	1.6 [1.1, 2.3]
Maternal Education			
	< 12 years	Referent	Referent
	12 years	1.1 [0.7, 1.7]	0.8 [0.6,1.0]
	> 12 years	0.7 [0.5, 1.1]	0.7 [0.5, 0.9]
Neighborhood Deprivation			
	Low	Referent	Referent
	Medium	1.1 [0.9, 1.4]	1.4 [0.9, 2.1]
	High	1.2 [1.0, 1.6]	2.1 [1.4, 3.2]
	Very High	1.5 [1.0, 2.3]	1.7 [1.2, 2.6]
Neighborhood Violent Crime			
	Low	Referent	Referent
	Medium	0.9 [0.7, 1.1]	1.2 [0.8, 1.8]
	High	1.1 [0.8, 1.3]	1.5 [1.1, 2.2]
	Very High	1.3 [0.9, 1.7]	1.4 [1.0, 2.0]

TABLE 3, continued.	White Non-Hispanic Women	Black Non-Hispanic Women
	OR [95% CI]	OR [95% CI]
Neighborhood Theft Crime		
Low	Referent	Referent
Medium	0.9 [0.7, 1.1]	1.6 [1.1, 2.3]
High	0.9 [0.7, 1.2]	1.4 [1.0, 1.9]
Very High	1.0 [0.8, 1.3]	1.2 [0.9, 1.6]
Neighborhood Property Crime		
Low	Referent	Referent
Medium	0.9 [0.7, 1.1]	1.0 [0.7, 1.5]
High	0.9 [0.7, 1.2]	1.2 [0.9, 1.6]
Very High	1.0 [0.8, 1.3]	1.1 [0.8, 1.6]
Neighborhood Vice Crime		
Low	Referent	Referent
Medium	1.0 [0.8, 1.3]	1.3 [0.9, 1.8]
High	0.9 [0.7, 1.2]	1.3 [0.9, 1.7]
Very High	1.2 [0.9, 1.5]	1.3 [1.0, 1.7]

TABLE 4: Adjusted Odds Ratios[1] [95% CI] for preterm birth among sample living in city of Raleigh crime area (1999-2001.	White Non-Hispanic Women	Black Non-Hispanic Women
	OR [95% CI]	OR [95% CI]
Neighborhood Violent Crime		
Low	Referent	Referent
Medium	0.9 [0.7, 1.1]	1.3 [0.9, 2.0]
High	1.0 [0.7, 1.3]	1.4 [1.0, 2.0]
Very High	1.0 [0.7, 1.5]	1.2 [0.8, 1.8]
Neighborhood Theft Crime		
Low	Referent	Referent
Medium	0.9 [0.7, 1.1]	1.5 [1.0, 2.1]
High	0.9 [0.7, 1.1]	1.3 [0.9, 1.8]
Very High	0.9 [0.7, 1.2]	1.1 [0.8, 1.5]
Neighborhood Property Crime		
Low	Referent	Referent
Medium	0.9 [0.7, 1.2]	1.2 [0.9, 1.8]
High	0.9 [0.7, 1.1]	1.1 [0.8, 1.5]
Very High	0.8 [0.6, 1.1]	1.1 [0.8, 1.4]
Neighborhood Vice Crime		
Low	Referent	Referent
Medium	1.0 [0.8, 1.3]	1.3 [0.9, 1.8]
High	0.8 [0.6, 1.1]	1.0 [0.7, 1.4]
Very High	0.9 [0.6, 1.3]	1.1 [0.8, 1.6]

1. Models adjusted for maternal age, education, marital status, and neighborhood deprivation

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