

**PERCEIVED NEIGHBORHOOD STRESSORS AMONG WOMEN ENROLLED IN  
THE WOMEN, INFANTS AND CHILDREN (WIC) PROGRAM IN  
ALLEGHENY COUNTY, PA**

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Submitted to the Graduate Faculty of  
Behavioral and Community Health Sciences  
Graduate School of Public Health in partial fulfillment  
of the requirements for the degree of  
Master of Public Health

University of Pittsburgh

2014

UNIVERSITY OF PITTSBURGH

Graduate School of Public Health

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**ABSTRACT**

**Objective:** Neighborhood environment has been linked to psychosocial stress and preterm birth and low birth weight among African American women. Preterm birth and low birth weight are the second leading causes of infant death in the U.S., and they account for the excessive black-white gap in infant mortality in the U.S. The purpose of this thesis was to explore women's perceptions of their neighborhood and the impact of neighborhood environment on their pregnancy and health.

**Methods:** This study used a qualitative design with semi-structured in-depth interviews. Objective indicators of crime, poverty, education and housing were collected on the neighborhoods women resided in to complement the qualitative data. A purposive sample of four multiparous postpartum women ranging in age from 25-40 was enrolled in the study recruited from the Allegheny County Women, Infants and Children (WIC) program. The women were inhabitants of four different neighborhoods in Allegheny County: Arlington, Greenfield, Homewood West and Spring Hill.

**Results:** Thematic content analysis revealed six themes. Women's perception of crime and violence in their neighborhood was consistent with the objective indicators for crime in their neighborhood. Women felt that crime and violence in their neighborhood increased stress during

their pregnancy, and they reported being exposed to crime and violence in neighborhoods they lived in previously. Parenting at a younger age and being pregnant at an older age were also perceived stressors in women's lives. The results also showed that access and availability of resources for pregnant and parenting women varied across neighborhoods.

**Conclusion:** These findings have significant public health relevance as they suggest that social and physical attributes within neighborhoods may have an impact on the health and pregnancy of the women who live in them. Understanding neighborhood level factors perceived as stressful can help improve maternal and child health outcomes through programming, advocacy, policy and education.

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## **PREFACE**

There are a number of people I would like to acknowledge who have helped me along this journey in completing my Master's degree. Thank you to my husband and daughters for their patience and support. I am grateful to my family and friends who have been my cheerleaders along this journey.

I would like to express gratitude to my thesis committee for their guidance and for the level of commitment they have shown in helping to see the research for this thesis completed. My appreciation to the women who participated in this study, for sharing their time and knowledge in good faith that the information they shared will help others in a meaningful way. Thank you to the Allegheny County, Women, Infants and Children (WIC) program for their assistance in recruiting women for this research. Many thanks to the Department of Behavioral and Community Health Sciences for awarding me with funding to conduct this research. Lastly, I would like to thank Dr. Edmund Ricci for his guidance and support in completing this degree.

## 1.0 INTRODUCTION

Neighborhood environment has been linked to poor birth outcomes among black women (Collins et al. 1998; Dole et al. 2003; Nkansah-Amankra, Luchok, Hussey, Watkins, & Liu 2010; Giurgescu et al. 2012). Black women are more likely to live in neighborhoods that are low income, have a higher degree of physical disorder (e.g. vacant housing, vandalism), and have a higher degree of social disorder (e.g. drug dealing, prostitution, and gangs) (Giurgescu et al., 2012). These neighborhoods, (either self-selected, or originating from historical segregation) tend to be predominately black. A consequence of living in suboptimal and resource-poor environments increase adverse health risks for black women overtime, resulting in racial differences in poor birth outcomes (Geronimus, 1996).

Preterm and low birth weight are the leading causes of infant death; they also account for the excessive black-white gap in infant mortality. Black women are more than twice as likely as non-Hispanic white women to deliver a very low birth weight infant and on average have more preterm and low birth weight deliveries in comparison to all other racial/ethnic groups in the U.S. (Martin, Hamilton, Ventura, Osterman, & Mathews, 2013).

Research on the effect of emergent factors like neighborhood environment and psychosocial stress on pregnancy and birth is limited, warranting investigation. Research suggests that psychosocial stress occurs as a result of external events and stimuli on the body and comes from a myriad of sources (Lazarus & Folkman, 1984), some being neighborhood,

socioeconomic status, racism and lack of social support. A systematic review of the literature by Blumenshine, Egerter, Barclay, Cubbin, and Braveman (2010) revealed 93 studies that reported associations between socioeconomic indicators and birth outcome. Furthermore, the studies showed racial/ethnic differences in the effect of socioeconomic indicators (Blumenshine et al., 2010). A systematic review by Metcalfe, Lail, Ghali, and Sauve (2011) resulted in 28 articles showing an association between neighborhood factors like unemployment rates, income, education, housing conditions, violence and crime rates, and adverse birth outcomes.

An in-depth understanding of how the context of neighborhood varies, or is unequal in terms of social, political and institutional capital, and the impact these factors have on women's health during pregnancy will help improve birth outcomes among black women and further research on infant mortality disparities. Much of the research in this area is limited to quantitative studies of neighborhood impact on birth outcomes, (Collins et al. 1998; Giurgescu et al., 2012; Mendez, Vijaya, & Culhane, 2014). Only a few studies use qualitative methods (e.g. focus groups) to investigate women's perception of their neighborhood environment (Giurgescu, Banks, Dancy, & Norr, 2013), and to explore stressors impacting pregnancy and preterm birth (Giurgescu, Kavanaugh, et al., 2013). Qualitative research is valuable for exploring individual behavior and thoughts about the world around us. The current study adds to the knowledge of neighborhood environment and its impact on health and pregnancy by presenting women's perceptions on these factors, of which more studies are needed.

Thus the overall objectives of this exploratory study were to (1) understand how women define their neighborhood; (2) explore their perceptions and beliefs about their neighborhood and the impact that it had on their health and pregnancy; and (3) objectively define distinct neighborhood characteristics. The second chapter of this paper introduces the reader to the

literature on neighborhood environmental impact, stress and poor birth outcomes. The third chapter discusses the methodology of the study, as well as variables used to create a neighborhood profile on study participants. In the fourth chapter the results of the study are presented, and the fifth chapter provides an interpretation of the study findings. The sixth chapter discusses the implications of the study for researchers and public health professionals. In the final chapter limitations and future directions for research are presented.

## **2.0 BACKGROUND**

### **2.1 NEIGHBORHOOD ENVIRONMENT**

Residential segregation, environmental degradation, high crime, and geographic location have all been linked to adverse birth outcomes for black women (Giurgescu et al., 2012). In a case-control study conducted by Collins and associates (1998), the authors reported that 42% of mothers who lived in self-perceived “unfavorable” neighborhoods reported more daily “stressful life events” than mothers who lived in “favorable” neighborhoods. For mothers who lived in these neighborhoods, the odds of delivering a very low birth weight infant if exposed to more than one life stressor were 3.1.

According to Ross and Mirowsky (1999), neighborhoods varying in their social and physical conditions can exist on a spectrum ranging from “ordered” to “disordered.” Social disorder refers to activities involving people, such as drug dealing, prostitution, and gangs, and has been shown to increase levels of stress when present in one’s neighborhood (Ross & Mirowsky, 1999). Physical disorder is considered the physical conditions of a neighborhood and includes vacant housing, vacant lots and vandalism. Giurgescu and colleagues’ (2012) research showed that neighborhood environments were related to psychosocial stress, which was linked to preterm birth among black women.

Preterm birth, defined as the birth of an infant at less than 37 weeks gestation, accounts for 12% of all singleton live births in the United States (Martin et al., 2013). Low birth weight and very low birth weight, are clinically defined as the birth of an infant weighing less than 2,500 grams and 1,500 grams, respectively; these account for 8.2% of all singleton live births in the U.S. (Martin et al., 2013). African-American women are more than twice as likely to deliver a very low birth weight infant as Non-Hispanic white women and on average have more preterm and low birth weight deliveries in comparison to all other racial/ethnic groups in the U.S. (Martin et al., 2013). Infants born preterm suffer short-term and long-term complications such as heart, lung and brain impairments, as well as diminished cognitive and behavioral development, and chronic illnesses (e.g. asthma) (Russel et al., 2007). These complications pose financial and psychological burdens for families, health systems and communities, and are preventable when infants are born as close to 40 weeks gestation as possible.

In 2011, the preterm birth rate in Pittsburgh increased by 12%, and the disparity between the black and white preterm birth rate was still high. The rate for black infants was 17.8%, and the rate for white infants was 11.9%. The preterm birth rate among African American women in Pittsburgh exceeds both the national and state level rates at 16.9% and 15.9% respectively. For white women in Pittsburgh, the preterm birth rates are comparable to the national and state levels, 11.1% and 11.9% respectively. While the Hispanic population in Pittsburgh is only 2.5%, the preterm birth rate among that population was 13.5%, which suggests that disparities in birth outcomes are not just limited to the African American community (March of Dimes, 2014). Large disparities also exist in infant mortality between blacks and whites. Clinically defined as the death of an infant less than one year of age, the black infant mortality rate still remains over



2.5 times higher (14.5 per 1000 live births) than the rate for white infants (5.7 per 1000 live births) (Allegheny County Health Department, 2012).

In a cross-sectional comparative study by Giurgescu and associates (2012) of black women who delivered either preterm or full term, results showed that women who reported higher levels of perceived social and physical disorder also reported higher levels of stress and objective physical disorder, and psychosocial stress was shown to predict preterm birth (Giurgescu et al., 2012). Collins and David (1997), in research using a cross-sectional design among black women living in neighborhoods characterized as having high social disorder found increased odds of delivering a low birth weight or small for gestational age infant among women residing in one of the most violent communities in Chicago. However, research by Jackson and associates (2001) and Collins and Butler (1997) has shown that even when black women have a high socioeconomic status, they still have worse birth outcomes than white women.

A study by Holzman and associates (2009) used linked census and birth records for singleton births to women between 20-39 years old among four groups (black smokers, black nonsmokers, white smokers, and white nonsmokers). They showed increased odds for preterm delivery among black and white smokers, and black nonsmokers, and further showed that women living in “high-deprivation” neighborhoods may show increased risk for preterm birth (Holzman et al., 2009). Similar results were found by Love and associates (2010) who linked neighborhood income to a trans-generational birth file containing information on infant and maternal births and showed economic effects over the life course. In this study the authors found that black women who were born in poor neighborhoods and remained poor as mothers had higher incidence of low birth weight and small for gestational age infants compared to white

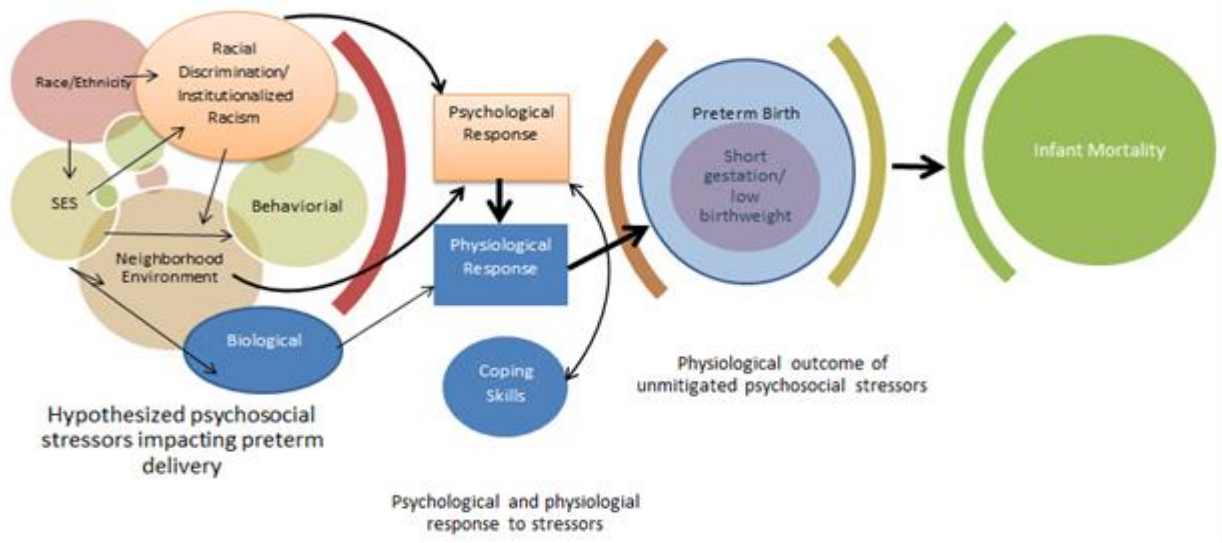
women, and in less economically deprived neighborhoods there was a decrease in low birth weight and small for gestational age infants with age (Love et al. 2010).

Link and Phelan (1995) in their influential work, hypothesized that socioeconomic disadvantage cuts across perceived proximal risks for mortality because it influences social conditions on a very fundamental level. Neighborhood deprivation can result from low socioeconomic conditions. Neighborhood characteristics are oftentimes correlated with socioeconomic indicators like income, education, marital status and race. Link and Phelan (1995) argue that social factors related to socioeconomic status dictate one's access to resources, ability to use them and understanding of them which may do little to alleviate the conditions of living in a chronically stressful environment, and may explain why even when controlling for education and income, black women still experience higher rates of poor birth outcomes.

Socioeconomic indicators oftentimes determine where one lives, and therefore can be a proxy for neighborhood (Ellen, Mijanovich, & Dillman, 2001). Research has been inconclusive on whether socioeconomic indicators are a direct risk factor for poor birth outcomes among black women. Theoretically, neighborhood environment can increase stress among black women and put them at risk for poor birth outcomes, and many studies have shown it to be a risk factor or mediator (Collins et al., 1998; Love, et al., 2010; Giurgescu et al., 2012). In a multilevel analysis of neighborhood risk factors for low birth weight in Baltimore, O'Campo and associates (1997) showed that indicators of social class and environmental stressors modified the relationship between individual-level risk factors and low birth weight. The data also showed that in high-risk neighborhoods the protective effects of prenatal care were diminished, substantiating the theoretical assumption that socioeconomic and physical and social disorders at the neighborhood level can impact birth outcomes (O'Campo, Xue, Wang, & Caughy, 1997).

## 2.2 STRESS

Research suggests neighborhood environment is linked to psychosocial stress among black women (Collins et al. 1998; Love, David, Rankin, & Collins, 2010; Giurgescu et al., 2012). Lazarus and Folkman (1984) describe the condition of stress as a result of an imbalance between demands and resources that occur when demand exceeds the ability to cope or mediate stress. One's ability to cope depends on individual variation which arises for three reasons: genetic variability in the natural world, divergent life histories among members of society, and social stratifications which provide some members of society with a head start over others (Lazarus & Folkman, 1984). Stress that occurs as a result of social or psychological conditions is defined as psychosocial stress, and is interrelated with neighborhood environment (Ross & Mirowsky, 1999). Figure 1 shows the hypothesized stressors impacting preterm birth among black women. The figure was adapted from Davis and associates' 2012 conceptual model of postpartum weight retention. The original model hypothesized that social, environmental and biological factors create stress and drive disparities in maternal health, specifically postpartum weight retention and obesity (Davis, Stange & Horwitz, 2012). The underlying premise in Figure 1, and the basis of this study, posits that various factors such as neighborhood environment impact women psychologically, causing stress.



Adapted with permission from Davis, Stange, & Horowitz, 2012.

**Figure 1. Hypothesized Relationships of Social, Behavioral, and Biological Determinants of Poor Birth Outcomes**

Stress has been consistently linked to poor birth outcomes among black women (Stancil, Hertz-Picciotto, Schramm, & Watt-Morse, 2000; Dole et al., 2003; Metcalf et al., 2011). It has been hypothesized that stress as a result of constant over-exposure to racism, poverty and discrimination faced by this group may help us understand why disparities in birth outcomes continue to exist (Alio et al., 2010). According to Geronimus’ “weathering” theory, declines in health contribute to poor reproductive outcomes as women age, and social inequalities lead to greater and more pronounced health declines among black women which result in widening disparities in health between blacks and whites as women age (Geronimus, 1996). Other researchers refer to “allostatic load” (McEwen, 1998) or “premature aging” (Hogue & Bremner, 2005) in their hypothesized relationships of the impact of chronic stress on health.

Maternal stress, operationalized in some studies as a reaction to chronic stressful life events or anxiety, has been associated with increased low birth weight and preterm delivery among black women (Geronimus, 1996; Lu & Halfon, 2003). Exposure to stress during pregnancy increases levels of various hormones within the body causing a physiological

response that can precipitate preterm labor, what is called the General Adaptation Syndrome (G.A.S.), or “fight or flight”; during the “alarm stage” corticotrophin-releasing hormone (placental CRH), adrenocorticotrophic-releasing hormone (ACTH), cortisol, noradrenalin, and B-endorphin are released in large quantities into the blood stream (Seleye, 1956). Increased B-endorphin has been associated with increased vascular resistance of the umbilical and uterine arteries, factors associated with fetal hypoxia (intrauterine oxygen deprivation), which can cause growth restriction (Rich-Edwards & Grizzard, 2005; Bastani, Hidarnia, Montgomery, Aguilar-Vafaei, & Kazemnejad, 2006).

### **2.3 SOCIAL, BEHAVIORAL, PSYCHOSOCIAL AND BIOMEDICAL FACTORS**

Lack of prenatal care is one of the most widely referenced behavioral risk factors for preterm birth and low birth weight deliveries among black women. Black women are less likely to receive early and regular prenatal care. In 2008, only 60.3% of black women, compared to 76.6% of white women in the U.S., received prenatal care in their first trimester (U.S. Department of Health and Human Services, 2011). There has been a consensus that early and regular prenatal care can reduce risk for infant mortality, prematurity, and low birth weight among black women (Institute of Medicine, 1985); however, research in this area has been unconvincing ( Lu & Halfon, 2003). A systematic search of OVID-MEDLINE (1970-2005) electronic databases found that even when access to prenatal care has improved, disparities in infant mortality between black and white infants still exist (Anachebe, 2006).

Cigarette smoking, alcohol and drug use have also been cited as behavioral risk factors for preterm birth among women. Infants born to mothers who smoked or used alcohol or drugs

during their pregnancy were more likely to have birth defects, be born preterm and low birth weight and to be at an increased risk for Sudden Infant Death Syndrome. Black women are less likely to smoke during pregnancy yet infant mortality rates are still disproportionately higher among this group. Between 2002 and 2010, 21.8% of white women versus 14.2% of black women smoked during their pregnancy (Centers for Disease Control and Prevention, 2011). Both groups had similar rates for alcohol use 12.8% for black women and 12.3% for white women, yet infant mortality disparities still exist (U.S. Department of Health and Human Services, 2012).

In Allegheny County, infants born to mothers with no high school diploma or high school equivalency (GED) had the highest rate of mortality from 2003-2007, and those born to mothers with some college or more had the lowest rate of mortality. However, among black women, education level seems to have little effect. Infants born to black mothers with some college or higher still had an infant mortality rate that was more than twice as high as that of white women with the same amount of education in the county (Allegheny County Health Department, 2013). In a case-control study conducted by Collins and Butler (1997), black women reporting an age over 30 years or having more than 12 years of education were still likely to deliver an infant of very low birth weight. Data from the Allegheny County Preliminary Natality Report (2013) showed similar results among black women with a college degree and a Masters or PhD, and in a qualitative research study with college educated black women, Jackson and associates (2001) found that the multiple stresses stemming from gender and racism which black women experience may be risk factors for adverse birth outcomes (Jackson, Phillips, Hogue, & Curry-Owens, 2001).

In an effort to explain disparities in birth outcomes between black and white women in light of unconvincing evidence of the role behavioral risk factors might play, researchers have

speculated that black women may be genetically predisposed to premature birth outcomes (David & Collins, 2007). A study by David and Collins (2007) found after comparison of birth weight among three groups of women, U.S. born white, U.S. born black and African-born black women, that U.S. born black women delivered infants at lower gestational weight than both white women and African-born women. They also found that compared to black Caribbean women immigrants to the U.S., U.S. born black women still delivered babies of lower birth weight (David & Collins, 2007). Even more alarming is the authors found a generational trend towards decreasing birth weight among infants born to African and black Caribbean born women after residing in the U.S. for a substantial period of time, which suggests that environmental and social risk factors are in fact influencing poor birth outcomes among black minority women.

## **3.0 METHODS**

### **3.1 DESIGN**

This study involved a qualitative design using semi-structured in-depth interviews. Qualitative inquiry was chosen because it allows the exploration of the lived experiences of individuals and thus facilitates theory that is inductively generated from fieldwork (Patton, 1990). In-depth, semi-structured interviews are a reliable method for gaining insight into the conditions impacting behavior (Green, 2009b), and further facilitated an understanding of the women's beliefs underlying the conditions surrounding their neighborhood and pregnancy.

Subjects were recruited from the Allegheny County Women, Infants and Children (WIC) program. WIC is a federally funded special supplemental nutrition assistance program, funded by a grant to states which offers supplemental foods, health care referrals, and nutrition education for low-income pregnant, breastfeeding and non-breastfeeding postpartum women, and to infants and children up to age five (U.S. Department of Agriculture, Food and Nutrition Services, 2014). In order to qualify for WIC, applicants must have a medical or nutritional risk and fall at or below 185% of the U.S. Poverty Income Guidelines. The Allegheny County WIC program serves over 16,000 women annually.



### **3.2 SAMPLE AND PARTICIPANT CHARACTERISTICS**

A purposive sample of four multiparous postpartum women ranging in age from 25-40 was enrolled in the study. Subjects participated in one face-to-face semi-structured interview. Selection criteria included women who (a) were currently enrolled in the WIC program, or had infants enrolled in the program, (b) were either African-American or non-black, (c) were < 1 yr. postpartum (d) had delivered a single baby who was preterm or full-term, (d) were residents of the city of Pittsburgh (e) were residents of their current neighborhood for > 1 years, and (f) were English speaking. Women were selected based upon these inclusion criteria to ensure a balance of views.

### **3.3 RECRUITMENT PROCEDURES**

This study was reviewed and approved by the University of Pittsburgh Institutional Review Board. Permission to recruit from Allegheny County WIC sites was obtained from the WIC Program. Recruitment efforts were conducted at five WIC sites: McKees Rocks, Turtle Creek, Downtown Pittsburgh, Mt. Oliver, and Wilksburg. Participants were recruited using a recruitment flyer posted on a public board at WIC sites, and through onsite visits by the principal investigator. Participants recruited by the flyer were directed to call the principal investigator to determine eligibility via a phone screen. Those eligible participants who were recruited onsite by the principal investigator had the option of scheduling an interview for a later date or participating in an interview that same day at the WIC site.

The principal investigator met face-to-face with women and conducted interviews ranging from 30-60 minutes. Interviews took place in a variety of settings; however, most interviews were conducted in the participant’s home. Participants were read an introductory script prior to the interview discussing the risks and benefits of the research. An interview guide was used to collect data about their perception of neighborhood environment stressors and the impact of those on health and pregnancy. The questions developed for the interview are presented in Table 1. The interview questions were developed from a review of the literature using the keywords neighborhood environment, stress, health and birth outcomes. Questions along with probes were generated and reviewed by the thesis committee members. The questions were pilot tested to ensure they would capture data in line with the intent of the study, and that the language was appropriate for the target participant group.

**Table 1.** Perceived Neighborhood and Environment Interview Questions

What does the word ‘neighborhood’ mean to you?
What are your thoughts and feelings about your neighborhood?
Describe your neighborhood for me.
What do you like about your neighborhood, what don’t you like about it?
In what way is your neighborhood better or worse than other neighborhoods in Pittsburgh?
Tell me some of the reasons why you moved to your neighborhood?
Some people say that your neighborhood can affect your health, what are some good and bad ways someone’s neighborhood can affect their health?
Tell me about your pregnancy, what was that like?
Some people say that your neighborhood can affect your pregnancy or the birth of your child. What are some good and bad ways in which your neighborhood affected your pregnancy or the birth of your child?
So when women are pregnant in “ <b>insert name of neighborhood here</b> ” what is that like?

Interviews began with open-ended questions followed by specific probes. Interviews were audiotaped and then transcribed verbatim by the principal investigator using Express

Scribe. All participants completed a self-administered questionnaire collecting data on sociodemographic characteristics, relevant maternal health history and behaviors, perceived neighborhood environment, perceived social support, perceived neighborhood crime and perceived neighborhood physical environment. Participants received a \$10 gift card as compensation for their time.

### **3.4 VARIABLES AND INSTRUMENTS**

#### **3.4.1 Pittsburgh SNAP**

Objective neighborhood environment indicators on poverty, education and crime from 2010 were used to complement women's neighborhood perceptions. Housing indicators was the only data set used published in 2009. These data were compiled using participants' reported neighborhood taken from Pittsburgh SNAP (PGHSNAP). Neighborhood indicators were compared against citywide indicator averages in the same category as a means of comparison.

PGHSNAP was created by the Pittsburgh Department of City Planning and is a repository of selected aggregated indicators at the census block group level. Datasets and static maps are available for all 90 neighborhoods in Pittsburgh, giving a representation of conditions in each neighborhood.

The indicator chosen to measure income was the percentage of the population in the neighborhood that fell below the 2010 poverty line. Education was defined as the highest level of education residents in the neighborhood completed as a percentage.

Crime reports, used as an indicator of neighborhood crime, were divided into two categories: Part 1 reports and Part 2. Part 1 crimes are major crimes reported directly to the police. These were violent and property crimes. Violent crimes are defined as aggravated assault, rape, murder and robbery. Property crimes are arson, burglary, larceny-theft and motor vehicle theft. Part 2 crimes are tracked crimes which include simple assault, curfew offenses, loitering, embezzlement, forgery and counterfeiting, disorderly conduct, DUI, drug offenses, fraud, gambling, liquor offenses, prostitution, runaways, sex offenses, public drunkenness, stolen property, vandalism, vagrancy and weapons offences (City of Pittsburgh, Department of City Planning, 2011). Indicators for Part 1 and 2 crimes were reported on a per capita basis, which is the total number of reports per 100 persons in the neighborhood.

Housing indicators came from the 2008-2009 Building Conditions Survey, which was a street-level survey conducted with the Community Technical Assistance Center (CTAC). The survey is an assessment of the condition of the exterior of buildings in a neighborhood, and they were put into one of three categories: Good/Excellent, Average, and Poor/Derelict.

### **3.4.2 Neighborhood Infant Mortality Rate**

Infant mortality rates calculated by neighborhood in Pittsburgh, PA, were added to the women's neighborhood profile to provide insight into incidence at that level. The rates reflect mortality per 1000 live births in that particular neighborhood and were compiled as a five-year aggregate from 2007-2011 (Allegheny County Health Department, 2014).

### **3.5 DATA ANALYSIS**

Data were analyzed using content analysis based on concepts of thematic content. Thematic content analysis is commonly used in qualitative research and facilitates comparative analysis of respondents' accounts from interview transcripts and notes in order to identify themes that are common in the data (Green, 2009a). Audiotapes were transcribed verbatim, and three-digit codes were used in place of participant' names. The principal investigator initially read each transcript in its entirety and marked distinct comments that were felt to represent discrete thoughts or themes. Thematic content analysis consisted of extracting the comments, attaching a code and separating them into categories with thematic labels. This process resulted in the consolidation of some categories into related themes. Atlas.ti 7, a computer software program designed for qualitative data analysis, was used to facilitate the analysis.

## **4.0 RESULTS**

### **4.1 DESCRIPTION OF THE SAMPLE**

A total of four participants enrolled in the study and participated in in-depth interviews. The participants ranged in age from 26 to 34 (mean age = 30.5 years [ $\pm$  4.12]), two self-identified as non-Hispanic white and two as non-Hispanic black. Two of the participants were married at the time of the study. Only one was a college graduate. Two had “some college” and one had “some high school.” Two women were unemployed, one was employed part time and another was employed fulltime. All women reported an annual household income below \$19,000, and two had incomes below \$15,000. Two women reported having lived in their current neighborhood, at the time of the study, at least one year. One participant had lived in her neighborhood, at time of study, for six years and another for 33 years. Participants came from four neighborhoods in the city of Pittsburgh: Arlington, Greenfield, Homewood West and Spring Hill. Figure 2 shows a map of the neighborhoods in the city of Pittsburgh (City of Pittsburgh, 2011). Stars are used to show the location of the neighborhoods represented in this study.



**Figure 2. City of Pittsburgh Neighborhood Map**

Women gave birth at a mean gestational age of 39 weeks ( $\pm .577$ , range 39-40). All women delivered full term and were multiparous. The mean age of their baby at the time of the study was four months ( $\pm 1.82$ , range two to six months). The mean gestational age for a first prenatal visit was seven weeks ( $\pm 1.41$ , range six to nine weeks). Three women reported having “ever breastfed” their baby, and three women reported having received WIC “at any time during” their most recent pregnancy.

Table 2 shows participants’ sociodemographic description and objective neighborhood environment indicators on poverty, education, housing and crime, using participants’ reported data taken from PGHSNAP.

**Table 2.** Sociodemographic Description of Participants and Neighborhood Indicators

	Participant 1	Participant 2	Participant 3	Participant 4
Neighborhood:	Arlington	Greenfield	Homewood West	Spring Hill
Years lived in Neighborhood:	6 yr. 2 mos.	33	1 yr. 7 mos.	1 yr.
Age:	26	34	28	34
Highest grade of school completed:	Some high school	College graduate	Some college	Some college
Annual Household Income:	\$0-\$15,000	\$15,001-\$19,000	\$0-\$15,000	\$15,001-\$19,000
<b>PGHSNAP Indicators</b>				
Est. Percent Under Poverty (2010):	20.3%	9.2%	36.8%	33.7%
High School Graduate:	65.3%	42.8%	53.6%	58.7%
Housing % Good / Excellent Buildings:	0.3%	1.0%	2.4%	4.8%
% Average Buildings:	97.6%	97.5%	85.0%	91.3%
% Poor / Derelict Buildings:	2.1%	1.4%	12.6%	4.0%
Crime Part 1 Crime per 100 Persons:	2.7	2.0	6.8	4.6
Part 2 Crime per 100 Persons:	4.5	2.3	9.2	6.5
Gestational Age at Birth:	40	39	39	40
Neighborhood 5 year aggregate infant mortality rate (2007-2011):	9.4	2.3	23.8	11.6

## 4.2 THEMES

The findings of this study were clustered into six themes: 1) I feel safer here; 2) I feel a sense of community; 3) My neighborhood is okay, but I tend to keep to myself; 4) My neighborhood affects me mentally and physically; 5) My neighborhood impacts my pregnancy; 6) There are some things that cause me stress during pregnancy.



#### 4.2.1 I Feel Safer Here

A recurring theme among the interviewees was that they felt their neighborhood was safer, especially in relation to other neighborhoods they had lived in. All the women, except for the woman from Greenfield, expressed this sentiment. The fact that they felt safer in their current neighborhoods in comparison to previous neighborhoods they lived in suggests that they have become accustomed to the social disorder present in their neighborhoods, and that this disorder has become chronic in their lives. The following quotes reflect those sentiments:

Homewood woman: *“Um, it may be a lot of violence here, even though I’m used to violence, but I actually feel semi-safe here because I just do...there is violence, but I’ve been here a year and seven months and I’ve only encountered one negative thing and it was basically more of a driving, not particularly where a shoot-out was happening.”*

Arlington woman: *“It’s a little bit better than some of the neighborhoods I have lived and been to but it’s still not...to me it’s all the same, it’s just not as bad as some of them... um, safety wise, really, that’s it.”*

Greenfield woman: *“I’m sure there’s some things that go on in my neighborhood that go on in other neighborhoods that could be worse in my neighborhood but as long as you don’t associate with that then you really don’t have to worry about it.”*

Spring Hill woman: *“Um, but also from the neighborhoods that I hung in a lot when I was growing up, a neighborhood can be pretty violent. There’s a lot of sad stuff that happened in the neighborhoods as I grew up, especially you know, urban neighborhoods. A lot of murders, and so this neighborhood to me, it’s a little safer even though the North Side has a lot of, um, things, people say bad things about the North Side, things do happen over here like they happen everywhere else but this particular part is pretty safe, um, for my kids so I feel, I feel a little safer up here.”*

#### 4.2.2 I feel a sense of community

Participants expressed thoughts about elements existing in their neighborhood that lead to a positive sense of community. From their perspective, community is different from neighborhood. Community is defined as the feeling of fellowship with others as a result of shared or common attitudes or goals.

In Homewood, some of these elements were community development and revitalization as well as collaboration among residents to make this happen. The woman from Homewood also felt that knowing her neighbors and people looking out for each other promoted a positive sense of community. The woman from Greenfield expressed having a close-knit community as leading to a positive environment. In Spring Hill, the community newspaper was seen as an element promoting a positive sense of community in the neighborhood. Perception of community is reflected in the following quotes:

Homewood woman: *“Well, the positive about it is that I can see the progression of them trying to rebuild this neighborhood and trying to keep it clean and come together as a community...they’re actually trying to work to make a better community for their selves and their children and the upcoming future.”*

*“A good thing is that when my children walk outside they know their neighbors and they can say ‘hi’ and they’re comfortable enough, and the neighbors are comfortable enough that we can work together where if something was to go wrong they would know where to go or we can look out for each other.”*

Greenfield woman: *“Everybody knows everybody... most of the people are friendly in the neighborhood.”*

Spring Hill woman: *“This neighborhood up here that I live in now they actually have a, um, like a little newspaper where, um, if you're new in the neighborhood, if you give them your information, they welcome you to neighborhood, um, any marriages, deaths, anything that's going on in Spring Hill they announce it...they will also put in there if there has been any police calls, any calls that go to 911 for that month they put it in there so if there was a robbery on this street they put it in there, if it was domestic, drugs, anything that goes on in that month that was reported to the fire department, police station, anything like that, they put it in the newspaper and it goes to everybody's house.”*

#### **4.2.3 My neighborhood is okay, but I tend to keep to myself**

A recurring theme among the women from Homewood, Arlington and Spring Hill was that they believed their neighborhoods were “okay” to live in. However, they reported that they keep to themselves and do not associate much with their neighbors or others in their community. The following quotes reflect those sentiments:

Homewood woman: *“So far I stay to myself but my neighbors that I've got acquainted with they're okay.”*

Arlington woman: *“I really try not to make friends with anybody, you know, from this neighborhood because to me they're just, I don't, to me they're just different. Like maybe I'm different to them but to me they're different. They're just not somebody I would be around or like to be around. I've tried and it just is like, it's not like I have problems with anybody, 'cause again, like I get along with everyone still, but I just, after I try to like get to know somebody and I feel like once I hang with them if they're not somebody then, that's it, if I see them then I'll talk to them, other than that they can call if they want to, I don't even really answer my phone.”*

Spring Hill woman: *“I kinda stay to myself [OKAY]. I do speak to people but I don't really get, get a chance to get too deep into their information or let them into mine...I go out of the house, go to work, come home. Unless me and the kids were going somewhere and we still just, I mean we may walk, take a walk around the block just for exercise but I don't really get involved too much in my neighborhood.”*

#### **4.2.4 My neighborhood affects me mentally and physically**

All participants acknowledged that the social and physical environment of one's neighborhood can have an impact on individual physical and mental health and behavior. Some of the factors present in their neighborhoods which they believed impact health were drug use and social pressure to use drugs, smoking, “filth,” dirt or trash, smoke pollution from fires, rodents, and mills. They also mentioned some elements present within their neighborhood which can improve health, and those were community gardens and the food reaped from them, and clean air resulting from the use of hybrid cars.

There was a sentiment that living in a “bad” or “depressing” environment can impact health in a negative way by causing people to make poor choices in life and leading them down the wrong path. As well, a poor environment was thought to cause one to be depressed thus having a negative effect on her mental health as evidenced by the following quotes:

Arlington woman: *“Some people when they move to different neighborhoods they get involved with the wrong things like drugs. I've seen people move to neighborhoods and perfectly never touched anything, moved to neighborhoods and start using or smoking cigarettes or you know like the things around them like if that's filthy, I mean you're breathing in all that outside.”*

Greenfield woman: *"I have to say our neighborhood's pretty clean. We're not close to any mills that, you know, would affect your health like what used to be in Hazelwood. Um, I guess a lot more people are driving like hybrid cars so the neighborhood's nice. Um, people are planting a lot more so that's helping with the air."*

*"I guess if it's not a really good neighborhood, if there's a lot of bad things going on in the neighborhood, it can depress you."*

Homewood woman: *"Since the weather is breaking this is the time that we're going to start planting, doing gardens around the neighborhood. I think that is healthy, promoting healthy food. Um, it's unhealthy because of all the different vacant houses and the trash that's around but being that the community is coming together to fix it, it's like fifty-fifty. It's bad, it affects the home because like before they tore the homes down, beside me I had houses that had field mice, raccoons, cats, all different types of stray animals were coming close to your home and would travel to your home. Like field mice would try to come into your house because of all the stuff that was over there, because of how close to the home they were. Certain houses would catch on fire, that would pollute the air and not only pollute the air, if the house was close to your home then that smoke went into your home which caused damage to another person's home or their air and being that they're, we're trying to come together to fix that so that we can have a healthier environment outside and inside it shouldn't affect us too much anymore 'cause before it made me not want to live here because I felt so dirty."*

Spring Hill woman: *"Um, there's this saying like you're a product of your environment and um, it's up to you to get out of a bad environment. You know, everybody should have a little bit of wisdom enough to see if they're in something that's not, if their surroundings aren't too good there, there's always a way out, it's just up to you to get out of it so I do believe that you can become a product of your environment if you're around a whole bunch of negativity and it turns you bitter, you just follow right on into it if that's all you see all your life you just kinda follow*

*right into it, but if you see a more pleasant side of living you're more familiar with that then you may, you know continue to go down that road although some people from that side also, you know, it could go either way. You know, you could grow up around a lot of positivity and turn negative so I do believe that you're a product of your environment but ultimately anybody can change."*

#### **4.2.5 My neighborhood impacts my pregnancy**

All the participants except the woman from Arlington acknowledged that neighborhood can have an impact on pregnancy overall, but there was some sense that if one shielded herself from negative elements within the neighborhood then the degree of impact was small. Some of the elements in their neighborhood which affected their pregnancy were violence, living near or on a busy street in the neighborhood, worrying about the safety of their children, poor physical environment, being stuck in the house during long winter months and not being about to get out and move around, and hostile people in the neighborhood. The following quotes reflect these sentiments:

Homewood woman: *"Um, it affected me in a negative way during my pregnancy and at a time, um, only due to the fact that there was a lot of violence going around at that time, and it stressed me out a little bit because I was worried of basically being an innocent bystander and being the fact that I live on a main street in Homewood in the main drag, and then the cars and the traffic and I have a four and five year old so I'm little skeptical about them on the porch and different things, so it affected my pregnancy a little bit because I was so worried and stressed about the environment that my children were in and me taking that chance as if harm could come my way."*

Greenfield woman: *"Um, I don't really think there were any bad effects from my neighborhood with my pregnancy. I'm thinking maybe some of the good effects were um, being able to go*

*outside, being able to take a walk. Being able to take my son somewhere, you know, it got me some exercise, it got me some fresh air. Other than being cooped up in the house with this very long winter. I mean I guess that would've affected my pregnancy you know too, kinda being cooped up in the house. Sitting around. Dragging everything through in the snow. But all in all I think it was pretty good as far as environmental wise."*

*"There wasn't really anything bad other than sometimes people not being so nice like in a grocery store, people trying to shove their way through and not caring if they bumped a pregnant woman or whatever."*

Spring Hill woman: *"Well, my neighborhood hasn't affected any part of my pregnancy at all, um, like I said I pretty much stayed to myself...I don't really get involved too much in my neighborhood for it to affect me so for my pregnancy it didn't, did nothing for me."*

#### **4.2.6 There are some things that cause me stress during pregnancy**

All the participants except the woman from Greenfield acknowledged sources of stress during pregnancy and made a connection between stress and its impact on their pregnancy and the birth of their child. Some of the sources mentioned were younger or teenage parenting, and being pregnant at an older age. Being a victim of crime was also identified as a source of stress for the women in Arlington.

Not only did they identify some of the sources of stress during their pregnancy, but they were able to articulate the direct impacts of stress on their pregnancies. Some of the effects were increased stress and worry, reduced appetite during pregnancy, increased desire to smoke, and decreased physical activity. Some of the quotes expressing these views are as follows:

Homewood woman: *"You can stress anywhere, you can have violence anywhere, so I would say it may be a little bit more stressful than certain mothers in different neighborhoods but*

*overall I think that I would as a female pregnant in Homewood say that it was okay and had a healthy baby.”*

*“So when you say pregnant and a woman, the first thing that may come to mind are younger teenager mothers who are pregnant with children who aren’t grown yet and still may need to grow and they’re trying to raise their child, which may make it harder and difficult for that mother to raise their child because they’re not quite a woman yet.”*

*“And that’s the only way it affected me a little bit, it just made me a little stressful and little bit worried so it affected my pregnancy, which made me, you know, made me not eat a little bit more or worry a little bit, which, you know, you worry and stress that goes towards your baby so that can affect your child and stuff like that.”*

*Arlington woman: “I’m a smoker. But um, I know there’s days I get nervous, I hear things like no one lives downstairs but someone kicked in the basement door downstairs, so if they can get through the basement door they can get through this door to come into the main hallway and it like makes me nervous, you know what I mean, and there’s nothing like I can really do...so it makes me want to smoke more.”*

*Spring Hill woman: “I did worry a lot when I was pregnant because you hear so much about women getting a little older having babies and all of the complications so I did worry a lot about that. I worried about my delivery.”*

*“That [gunshots] would be an additional thing to worry about, you know, ‘cause leaving in and out of the house and it doesn’t even matter what time of the day it happens...it can make a pregnant woman worry if you did live in that environment, that could be a little stressful for you and the baby.”*



## 4.2.7 Neighborhood Comparison

### 4.2.7.1 Access and Availability of Resources for Pregnant Women by Neighborhood

There were differences among participants in their perception of available resources for pregnant women. The women from Homewood and Greenfield reported easier access to a greater number of resources in their neighborhood than women living in Spring Hill and Arlington. Homewood and Greenfield are more urban neighborhoods which are geographically central in the city of Pittsburgh whereas Arlington and Spring Hill are located on the southern and northern outskirts of the city respectively (see Figure 2 on page 22), which may account for the lack of, or perception of a lack of resources available in those communities for pregnant and parenting women. A better understanding of these differences are reflected in the following quotes:

*Greenfield woman: "Well, I receive WIC. You know, there's a lot of offices if you're close by. Um, there's also programs depending on your insurance around here that give you free breast pumps, give you, a program to complete, you know, so many doctors' appointments, do everything you're supposed to do, give you a free car seat, or a free pack-n-play. Um, there's a lot of stuff to help you around here."*

*Homewood woman: "That was good actually about my community. For a pregnant woman if you don't have transportation there's a lot of transportation, there's a lot of bus lines. There's a lot of things. We're in Homewood where we're close to outside communities, which is East Liberty and East Hills and Penn Hills and Wilkinsburg, so we're like in the middle, in the center so there's like a lot of other places where we can go to and get to. As far as job wise if you know you wanted to work you would be on the bus line, as far as the hospital there's a lot of health centers actually in the community or that are nearby."*

Arlington woman: *“I mean, there’s really no, there’s no um, there’s really nothing up here for a pregnant woman either ‘cause you know, like the Genesis program and stuff they have, like they don’t have anything like that like, little groups or anything, you know, like that up here, or anything to help pregnant women, like if someone’s just first pregnant and they don’t know anything or you know there’s nothing up here for them so, I mean like the WIC office isn’t too far, that’s about the only close thing, but other than that and I really don’t like that WIC office either so…”*

### **4.3 DEFINITION AND PERCEPTION OF NEIGHBORHOOD**

#### **4.3.1 Definition of Neighborhood**

The participants in this study shared their thoughts on what a ‘neighborhood’ was by providing their own definition. In the quantitative literature and U.S. census data, ‘neighborhood’ is typically defined as a geographical unit of analysis based upon a defined network of roads, streets, and parcels of land categorized as census tracts or blocks (Messer et al., 2006; U.S. Census Bureau, 2013). The participants in this study defined ‘neighborhood’ as a collection of people and places situated within a defined environment that can be, or are intimately connected. Neighborhood was also thought to be an environment that is impacted by its inhabitants.

All four interview participants provided a definition of what “neighborhood” meant to them as evidenced by these representative quotes:

Arlington woman: *“Like a group of people”*

Greenfield woman: *“close family and friends”*

Spring Hill woman: *“Neighborhood means, a family outside of a family, where you get to know people and some people in neighborhoods they shut down their streets and they get together and they have cookouts, big street barbecues and they get to know each other and everything”*

Homewood woman: *“Environment that you live in. Um, it means it’s your community, it’s your neighbors, it’s your surroundings and however it is, is how you would want it to be”*

#### **4.3.2 Perception of Neighborhood**

Data from the participant interviews were combined with objective indicators on crime, housing, education and income to understand further neighborhood context. Results showed that participants’ perceptions of their neighborhood varied, and those perceptions were consistent with objective indicators for the women from Homewood and Arlington. The women from Homewood and Arlington expressed dislike of their neighborhoods and reported mixed feelings about their neighborhood. The women from Greenfield and Spring Hill expressed positive feelings about their neighborhood.

Homewood West has a higher percentage of houses in poor or derelict condition, and has a higher occurrence of Part 1 and Part 2 crimes compared to the other neighborhoods in this study. The participant in Homewood cited violence and poor physical conditions of the neighborhood as reasons why she has mixed feelings about her neighborhood.

Arlington also has a high occurrence of Part 2 crimes, and more residents with only a high school diploma compared to the other neighborhoods in this study. The woman in Arlington expressed clear dislike of her neighborhood due to crime and violence, especially drug use and trafficking and robberies.

Greenfield, compared to the other neighborhoods in this study, has less reported crime, higher percentages of residents with a college degree or higher, and better housing as indicated by PGHSNAP housing data. The woman from Greenfield indicated that she had lived in her neighborhood for 33 years, most of her life, and she perceived her neighborhood to be safe. She also expressed a clear love and appreciation for her neighborhood and overall liked it.

Spring Hill has the second highest rates of Part 1 and Part 2 crimes reported compared to the other neighborhoods in this study, and after Arlington has more residents with only a high school diploma. The woman from Spring Hill however, indicated that she liked her neighborhood, especially in comparison to other neighborhoods she lived in previously. The following quotes reflect women's perceptions of their neighborhood:

Arlington woman: *"Its okay, but I really don't like it personally."*

Homewood woman: *"My thoughts on my neighborhood are...in the middle. I fifty percent like it and I fifty percent don't."*

Greenfield woman: *"There's not much that I don't like about the neighborhood... I obviously love the neighborhood because I've never left it."*

Spring Hill woman: *"I do like this neighborhood. For me and for the kids it's convenient, if anything were to happen to my car there is public transportation very close."*

*"This is one of the better places because-because of the safety issue is the reason I had to move a lot, having children I didn't want them around so much violence."*

### **4.3.3 Perception of Physical and Social Environment in Neighborhood**

The women from Homewood and Arlington both had a negative perception of the social environment in their neighborhood, and the woman from Homewood also had a negative

perception of the physical environment in her neighborhood. Participants' perceptions of their physical and social environment are reflected in these quotes:

Homewood woman: *"The negative impact of my environment to me is the violence... not enough buildings that are actually built or homes that are torn down. It just doesn't look too pleasant."*

*"So there's a lot of vacant houses and there's a lot of houses that have been torn down and empty lots. Then the empty lots are trashy, so it doesn't have a good look."*

*"It's worse than other neighborhoods because of the violence."*

Arlington woman: *"I mean the neighborhood itself, like there's a lot of drugs around... there's a lot of people that just seem to do drugs."*

*"The corner store opens so late and closes so early because it got robbed so many times."*

## **5.0 DISCUSSION**

Findings from this research show that the participant's perception of crime in their neighborhood was consistent with the objective level neighborhood crime indicators. The women also believed that neighborhood social and physical disorder such as crime and violence increased psychosocial stress during pregnancy, which is consistent with a research study by Giurgescu and colleagues (2012). The women also expressed the ways in which stress manifested in their lives during pregnancy. Women living in higher socioeconomic neighborhoods were less likely to report exposure to chronic crime and violence.

Community development and awareness, as well as social ties with neighbors were elements seen as fostering a positive sense of community within the neighborhoods the women lived in. There were also reported differences in access and availability of resources for pregnant and parenting women across neighborhoods.

### **5.1 NEIGHBORHOOD PERCEPTION**

Pittsburgh, PA, the county seat of Allegheny County, is divided into 90 distinct neighborhoods, each with its own unique character. Each of these neighborhoods has a unique social, physical, economic and cultural identity. The women in this study were inhabitants of four different neighborhoods in Allegheny County: Arlington, Greenfield, Homewood West and Spring Hill.

Each of these neighborhoods varies by population size, land area, topography, and physical and social environment, which may have informed the participant's perception of her neighborhood.

The women's perception of crime in their neighborhood was consistent with the objective indicators on crime for their neighborhood. The women from neighborhoods with the highest per capita rates for Part 1 and Part 2 crimes expressed dislike for their neighborhoods and reported that crime and violence were prevalent in their neighborhoods. The woman from Greenfield reported little to no crime or violence in her neighborhood, and she had a more favorable view of her neighborhood, which was consistent with all indicators for that neighborhood.

This finding suggests that living in a suboptimal environment characterized by crime and violence increases stress among women, and black women in particular which may result in poor birth outcomes. In a study by Collins and associates (1998), black women who labeled their neighborhoods as 'unfavorable' reported more stressful life events than those who labeled their neighborhoods as 'favorable,' and in their study frequency of stressful life events was associated with very low birth weight. The infant mortality rate reported for all neighborhoods except Greenfield is higher than the County infant mortality rate of 7.5 (Allegheny County Health Department, 2012). Homewood West had the highest reported infant mortality rate of 23.8, followed by Spring Hill at 11.6, Arlington at 9.4, and Greenfield had the lowest rate at 2.3 (Allegheny County Health Department, 2014). Black women are more likely than their counterparts to live in unfavorable neighborhoods and experience daily life stressors, and a woman's perception that she lives in an unfavorable neighborhood by itself may be a chronic stressor, further fueling disparities in birth outcomes (Collins et al. 1998).

The women from Homewood and Arlington both expressed reservations about interacting with others in their neighborhood. This self-imposed separation may be a consequence of

perceived social disorder in their neighborhood. The woman in Spring Hill also reported that she is less likely to interact with her neighbors even though she had a favorable view of her neighborhood. Ross and Jang (2000) found that perceived disorder in one's neighborhood is associated with lower levels of integration within the neighborhood, and that lack of social ties within one's neighborhood perpetuates fear and mistrust of individuals living in the neighborhood (Ross & Jang, 2000).

Homewood had the highest rates of Part 1 and Part 2 crimes in comparison to the other three neighborhoods, and had the highest percentage of houses in poor or derelict conditions. The woman from Homewood also reported the presence of poor physical conditions within the neighborhood. Arlington had a high rate of Part 2 crimes. She also reported having only lived in her neighborhood for one year. Part 1 and Part 2 crimes for Spring Hill were the second highest of all neighborhoods in the study even though the participant did not perceive there to be much crime and violence in the neighborhood in comparison to others in this study. Infant mortality rates for all three neighborhoods were high.

This finding suggests that women exposed to physical and social disorder in their neighborhoods may be less likely to form social ties with others in their neighborhood which may reduce women's ability to mitigate stress during pregnancy. Ross and Jang (2000) point out in their study that the establishment of social ties within a neighborhood can reduce levels of fear and mistrust and helps foster social bonds with others. For pregnant women, perceived social support has been shown to ameliorate the psychosocial stress during pregnancy (Giurgescu et al. 2013).



## 5.2 WEATHERING

For the women from Arlington, Spring Hill and Homewood, reports of previous and current exposure to crime and violence suggest that for these women the crime and violence that they have been exposed to has become chronic.

According to Geronimus (1996), black women's health starts to deteriorate more rapidly in young adulthood as a result of long-term coping with chronic poor social and environmental conditions. This is what Geronimus calls advanced maternal aging, or weathering. The impact is that over time these women suffer poor birth outcomes as a result of maternal aging. Maternal health characteristics that are risk factors for poor birth outcomes advance with age and are more consistent with black women in low socioeconomic groups than with white women (Geronimus, 1996). The woman from Homewood lived in a neighborhood that could be considered low socioeconomic status. While the two black women in this study who reported dealing with chronic violence and crime in their neighborhoods delivered a full-term infant, their neighborhood infant mortality rate was high and gestational weight at time of birth was not recorded in this study.

More than 30% of the residents in Homewood West live below the poverty line, and it has the highest percentage of houses in poor or derelict condition (12%), compared to the other neighborhoods in this study. The woman from Spring Hill lived in that neighborhood for only one year; however, she reported having lived in other neighborhoods, which she stated were not as safe. Only 20% of residents in Spring Hill live below the poverty line, and only 4% of houses in the neighborhood were in poor or derelict condition; however, rates of Part 1 and Part 2 crime in that neighborhood are high comparatively. Given the constant exposure to crime and violence the two black women have experienced, and the high neighborhood infant mortality rate in their

neighborhoods, theoretically the women would be considered at advanced maternal age according to the weathering theory and at increased risk for low birth weight and preterm birth.

Weathering has not been shown to affect white women to the extent that it affects black women (Geronimus, 1996; Love, et al., 2010). This may be due in part to the fact that few studies have looked at white women living in very low socioeconomic neighborhoods like those that black women live in (Geronimus, 1996).

### **5.3 STRESS**

The women in the study expressly indicated which factors in their neighborhood impact health in general and which impacted their pregnancies. Two of the four women in this study cited crime, drug use and trafficking, poor physical environment, an overall ‘bad’ or negative environment and violence as being present in their neighborhoods which was consistent with the objective level indicators. Crime and violence were cited as the factors having the most immediate impact on their pregnancy by increasing levels of stress. This finding is consistent with qualitative research by Giurgescu, Banks, Dancy, and Norr (2013) and Giurgescu and associates (2013), in which women stated that living in ‘dangerous neighborhoods’ was a potential stressor for pregnant women. All women expressed that a ‘bad’ or ‘negative’ neighborhood can also impact one’s mental wellbeing. The findings of a qualitative study conducted by Barnes (2008) were consistent with the sentiments expressed by the women in this study, which was that stress can have an impact on a woman’s body and ultimately affect her baby (Barnes, 2008). Other factors cited as causing stress among women in general were parenting while young and being pregnant at an older age.

Giurgescu and associates (2012) showed in their study that objective social disorder (annual number of prostitution and drug-related incidents) and perceived crime increased the psychosocial stress of the women in their study. Their findings are consistent with those of this study. The women in this study cited crime and violence as a factor that increased stress during their pregnancies. Giurgescu and associates (2012) went on to show that objective physical disorder and psychosocial stress predicted preterm birth among black women. Collins and associates (1998) reported that black mothers who lived in self-perceived “unfavorable” neighborhoods reported more daily stressful life events, and the odds of delivering a very low birth weight infant if exposed to more than one life stressor was 3.1 for mothers who lived in these neighborhoods. The infant mortality rates for three of the four neighborhoods in this study were high enough to warrant further investigation into a relationship between psychosocial stress during pregnancy and poor birth outcomes in these communities.

#### **5.4 ACCESS AND AVAILABILITY OF RESOURCES FOR PREGNANT AND PARENTING WOMEN ACROSS NEIGHBORHOOD**

When the women in the study were asked their perception of how life is for pregnant women in their neighborhood, differences in access to and availability of resources for pregnant and parenting women across neighborhoods was a theme that arose from the data. The women from Homewood and Greenfield reported access to more resources than the women from Arlington and Spring Hill. Geographical location of the neighborhoods may account for these differences; however, for a neighborhood like Homewood, the reported infant mortality rate of 23.8% (Allegheny County Health Department, 2014) suggests that there may be some underlying

fundamental causes impairing women's ability to fully benefit from perceived resources available for pregnant women in that neighborhood.

Link and Phelan (1995) explain fundamental causes as access to resources, which help individuals to avoid disease and its consequences. However, even when one is able to modify conditions causing disease, or eliminate disease, a fundamental cause will trigger the disease to present itself again. Therefore health cannot improve until the fundamental causes of disease are addressed (Link & Phelan, 1995).

Similarly, for pregnant women living in Homewood, the presence of resources for these women does not guarantee optimal birth outcomes if, according to Phelan and associates (2004), they are not aware of these resources, they cannot afford them, lack knowledge in how to utilize them to their advantage, or lack motivation to change risky behaviors. This finding further highlights the importance of understanding the context of women's lives to eliminate disparities in birth outcomes.

## **6.0 IMPLICATIONS FOR PRACTICE, PUBLIC POLICIES AND RESEARCH**

Few studies have explored women's perceptions of the neighborhood they live in and the ways stress is manifested in their lives. The findings of this study are significant because there have been a number of studies conducted looking at neighborhood environment and its impact on pregnancy and poor birth outcomes among black woman, but most of them were descriptive studies (Collins et al. 1998; Dole et al. 2003; Nkansah-Amankra et al. 2009; Giurgescu et al. 2012). This study sought to understand women's perception of their neighborhood and is significant because the findings were consistent with other studies linking psychosocial stress with neighborhood crime and violence (Collins et al, 1998; Giurgescu et al, 2012). This is important because the findings can help researchers and public health practitioners understand the context of women's lives in these neighborhoods. Link and Phelan (1995) highlighted the importance of contextualizing individual risk factors by urging researchers to understand what it is about people's life circumstances that shapes their exposure to risk. Through contextualization, we are able to identify a problem and focus on a solution. Individuals have different reasons for living in their neighborhoods. For some it is socioeconomics, for others it is familial or social connections. In this context, qualitative research is important because it facilitates an understanding of the reasons why someone may choose to remain in a neighborhood perceived as unfavorable.

The findings from this study also showed that women's perception of their neighborhoods, perceived stressors and exposure to stressors varied across neighborhoods. This has public health significance because as practitioners in the field of public health, and as researchers, it is important to understand that populations are not homogenous and that the epidemiology of maternal stress and preterm birth and low birth weight can vary based upon the host, agent and the environment. Hogue, Hoffman and Hatch (2001) proposed a conceptual framework, modeled after the triangle of epidemiological causality, to guide research on stressors which induce preterm birth among women. The host is the individual woman vulnerable to stressors; the environment includes the social and cultural conditions of stress, as well as modifiers of stress; and the agent is the immediate stressor requiring her response (Hogue, Hoffman & Hatch, 2001). The framework proposes there are some key factors to consider when assessing whether an individual is overwhelmed by stressors: strength of agent, host susceptibility to stress, background level of acute, environmental and contextual stressors, and moderating influence of host, environment and contextual resources for handling stress. As a guide, this framework elucidates the complexities of maternal stress and preterm birth and low birth weight. Stressors vary across neighborhoods, by host and by degree, and research efforts as well as public health responses should take these factors into account upon further research into conditions of psychosocial stress and preterm birth and low birth weight.

Through these women we are better able to understand sources of psychosocial stress in their lives. Three of the women in this study lived in neighborhoods with elements of physical disorder and crime, and they reported that crime and violence increased stress during pregnancy, which can lead to poor birth outcomes among black women (Geronimus, 1996; Collins et al., 1998; Girugescu et al., 2012). The results can be used to further explore factors identified as

stressful like teenage parenting or parenting while young, and pregnancy at an older age. This research can also be used to complement findings from quantitative research on psychosocial stress and pregnancy through mixed methods studies like the one conducted by Giurgescu and colleagues (2013) or through the development of assessment scales to be used as screening tools to identify at-risk populations (Giurgescu, Kavanaugh, et al., 2013).

These findings have several implications for public health practice. On a large scale, health disparities driven by low socioeconomic status cut across all major health conditions and thus indicators on crime, housing, poverty and education should be used to inform delivery of services to all populations on a large scale.

## 7.0 CONCLUSION

Neighborhood environment has been shown to impact preterm birth and low birth weight among black women (Collins et al. 1998; Dole et al. 2003; Nkansah-Amankra, Luchok, Hussey, Watkins, & Liu 2010; Giurgescu et al. 2012). Neighborhoods are unequal in their social and physical make-up (Ross and Mirowsky, 1999) and investigation into how these factors impact women's health and pregnancy can help improve birth outcomes among women. Furthermore, qualitative research on neighborhood environment and stress among pregnant women is limited, and therefore it is important that their views and perspectives are incorporated into research initiatives and public health responses aimed at improving birth outcomes.

The objectives of this study were to understand how women define their neighborhood; explore their perceptions and beliefs about their neighborhood and its impact on their health and pregnancy; and explore how objective neighborhood indicators complement their perception of their neighborhood. Qualitative interviews were used to meet these objectives. Women defined their neighborhood and provided perceptions of their neighborhood which gave insight into how the physical and social conditions within their neighborhood, affected health and pregnancy, and lead to psychosocial stress. The women further indicated how psychosocial stress was operationalized in their lives.

Objective indicators for crime, education, poverty and housing were taken from PGHSNAP (City of Pittsburgh, Department of City Planning, 2011) to create a neighborhood



profile and were used to complement women's perceptions of their neighborhood, providing additional context for the environment in which the women lived.

Neighborhoods are a microcosm of our larger society, and multiple factors converge to affect the health of women and their children. The socio-ecological approach to public health proposes a five-tier framework to improve population health and should be used to influence change at various levels to reduce negative neighborhood impact on pregnant women and improve birth outcomes (Fielding, Teutsch & Breslow, 2010). The framework is useful in this context because interventions are ordered by level. Interventions implemented on the lowest tier are most effective because they address socioeconomic conditions and reach a broader segment of society (Fielding, Teutsch & Breslow, 2010). In efforts to improve maternal health and birth outcomes, interventions need to address the social, political, and physical conditions which put black women at risk for poor birth outcomes.

Public health practitioners should take into account neighborhood context when developing interventions aimed at reducing poor birth outcomes among black women. Locally aggregated data like PHGSNAP can be used to inform public health responses targeting high-risk communities by providing context for interventions and identifying gaps in availability and accessibility of resources for pregnant and parenting women across neighborhood. Service based organizations serving pregnant women like Healthy Start, Nurse Family Partnership, Home Visiting programs, Early Head Start and WIC should be prepared to help women manage stress from neighborhood environment. These organizations can be made aware of neighborhood impacts on health and pregnancy, and advocate for women living in neighborhoods characterized as suboptimal.

Research into neighborhood environment and stress on pregnancy is still evolving. The epidemiology of poor birth outcomes varies by host, agent and environment. Researchers should utilize the triangle epidemiological causality model to further understand individual response to psychosocial stress during pregnancy. Few studies have explored women's perception of the neighborhood they live in and the ways stress is operationalized in their lives. A larger study exploring women's perception of neighborhood environment on health and pregnancy will provide a more diverse account of how these factors impact women's health. Results from this research identified additional stressors for women not cited in other studies on stress and pregnancy. These results should be further explored and can be used to develop assessment scales as screening tools to identify at-risk populations.

This study has several limitations. The sample size is not adequate for an exploratory study, or to draw any causal connection between neighborhood, stress and birth outcomes. While women identified stressors and reported connections between certain stressors and health and pregnancy, there may have been unidentified factors which contributed to reported levels of anxiety. Challenges with recruitment limited the study sample size. Therefore, themes saturation may have not been reached and thus a larger sample size may have produced different findings.

The women who participated in this study all delivered full term infants; however, gestational weight of infants was not recorded. In the future, a study which includes mothers of infants born both full term and preterm would be necessary to determine any relationship between birth outcomes and neighborhood stress. Neighborhood infant mortality data were included in the neighborhood profile which provided some context on incidence across neighborhoods. Two of the participants were referred through a colleague, and one participant was an acquaintance, so the women may have been selective about the information they shared

during the interview and on the sociodemographic and maternal health questionnaire. The study was conducted in Pittsburgh which is comprised of over 90 distinct neighborhoods making it unique in its geo-spatial makeup. The women's definition of their neighborhood boundaries may not reflect the true spatial boundaries defined by the city. Last, the interviews were conducted with postpartum women who were multiparous reflecting on their pregnancy experience so there may be a recall bias. Further, the women's perceptions may not reflect those of women who are prim parous.

In conclusion this study showed that women feel their neighborhood has an impact on their health and pregnancy, and that the presence of crime and violence in their neighborhood increases stress. Neighborhoods that are perceived as unsafe or unclean, and lack the social and economic capital to sustain a healthy environment fuel disparities in health and birth outcomes which can have long-lasting effects. Health starts where individuals learn, work and play, and efforts to ensure optimal health for women and their infants need to understand the context of these various factors on women's lives.

## APPENDIX A

### NEIGHBORHOOD CONTEXT INTERVIEW GUIDE

#### Contextualizing neighborhood environment

#### Qualitative Interview Guide

PI: Key James

≤12 Month Postpartum Retrospective Individual Interviews

#### 1. INTRODUCTION

- a. Read over Introductory Script explaining procedure for interview
- b. Address any questions or concerns regarding the research
- c. Ask participant to provide a code derived from the first letter of their child's name and their own birth month and birth day that will serve as their study number for the research

#### 2. QUESTIONNAIRE

- a. Give questionnaire & allow time to complete
- b. Ask participant to write their self-identified 3-digit number on their questionnaire
  - i. Set up Recording Materials while questionnaire is being completed

#### 3. INTERVIEW

- a. Explain: Interview will take approx. 60 minutes
- b. Explain: No "right" or "wrong" answers
  - ii. Answer honestly & openly
  - iii. For clarification: Ask interviewer repeat and clarify questions
  - iv. Discomfort? Tell interviewer if you are uncomfortable answering question
- c. Ask to speak in normal voice, loud & clear
- d. Ask to put phones, TV's, etc. on silence/vibrate mode
- e. Ask to minimize distractions
- f. Ask that beverages, snacks, restroom needs, etc. be taken *before* interview starts

#### 4. Start INTERVIEW

- a. Ask if there are any questions before beginning

- b. Turn on recorder
- A. OPENING

**M:** Again I would like to thank you for taking part in this research interview. My name is \_\_\_\_\_, and I will be conducting this interview today. I would like you to tell me the 3-digit number you put on your survey and one thing that you enjoy doing. Please speak clearly.

**B: Key Questions (60 minutes)**

**I. Perceptions of Neighborhood Environment**

**MN1:** I would like to ask you about the neighborhood you live in right now: Tell me, what does the word 'neighborhood' mean to you?

**MN2:** What are your thoughts and feelings about your neighborhood?

**MN3:** Describe your neighborhood for me.

**Probe:** Tell me about the people (ages i.e. old/young, children, teens)  
Tell me about the places around your neighborhood (i.e. Parks, stores, places to eat, businesses)  
Tell me about the environment (i.e. clean, busy, what is housing like)  
Tell me about the schools

**MN4:** What do you like about your neighborhood?

**MN5:** What don't you like about your neighborhood?

**Probe:** Noise, safety, places to shop/eat, environment

**MN6:** In what way is your neighborhood better or worse than other neighborhoods in Pittsburgh?

**Probe:** For example: safety  
Housing  
Diversity  
Income level  
Places to go/shop  
Schools  
Walkability

**MN7:** Tell me some of the reasons why you moved to your neighborhood?

**MN8:** Some people say that your neighborhood can affect your health, what are some good and bad ways someone's neighborhood can affect their health?

**MN9:** Tell me about your pregnancy, what was that like?

**MN10:** Some people say that your neighborhood can affect your pregnancy or the birth of your child. What are some good and bad ways in which your neighborhood affected your pregnancy or the birth of your child?

**Probe:** In what ways was your neighborhood supportive or less supportive for you as a pregnant woman?

**MN11:** So, when women are pregnant in “\_\_\_\_\_” what is that like?

**Probe:** What are some things about the neighborhood that are good for pregnant women?

What are some things that are not so good for them?

## **II. Summary Question**

**M:** We have talked a lot about your neighborhood and health and pregnancy. Is there anything else you would like to say about these issues?

**M:** This will end our interview for today. I thank you for participating in the study. The things we talked about today may help improve the health of other pregnant women and their babies. Thank you.

**APPENDIX B**

**NEIGHBORHOOD CONTEXT BASELINE SURVEY**

**1. What is your date of birth?**

\_\_\_\_(Day)\_\_\_\_\_(Month)\_\_\_\_\_(Year)

**2. When was your most recent baby born?**

\_\_\_\_(Day)\_\_\_\_\_(Month)\_\_\_\_\_(Year)

**3. Was your baby born (Please circle one):**

Full-term (Born **after** 37 weeks)?..... 1

Preterm (Born **before** 37 weeks)?.....2

**3a. How many weeks did you carry you baby? (Please write a number for example, 36 weeks):**

\_\_\_\_\_(Weeks)

**4. How many weeks or months pregnant were you when you had your first prenatal care visit? (Please do not count a visit just for a pregnancy test or for WIC) (Please write a number or check off the box):**

\_\_\_\_Week(s) **or** \_\_\_\_\_Month(s)

**or**  I never had prenatal care

**5. Was your new baby ever breastfed? (Please circle one):**

Yes..... 1

No..... 2

**6. Were you on WIC at any time during your most recent pregnancy? (Please circle one)?**

Yes.....

1

No (**Go to 6a.**).....2

2

**6a. Why were you not on WIC during your pregnancy? (Check all that apply):**

I never heard of WIC.....

1

I did not think I would qualify for WIC.....

2

I did not need WIC.....

3

I could not get to WIC when they were open.....4

I could not get through on the phone.....5

It was too hard to apply for WIC.....6

I used to be on WIC but did not like it.....7

I did not want to use WIC vouchers to shop.....8

Other (Please tell us: \_\_\_\_\_)

**7. What is your current marital status? (Please circle one):**

- Married..... 1
- Living with someone like we are married, but not legally married..... 2
- Separated, divorced, or widowed..... 3
- Single (never married)... ..... 4

**8. What is the highest grade or year of school you have completed? (Please circle one):**

- I never went to school.....1
- 8<sup>th</sup> grade or less..... 2
- Some high school, but I did not graduate.....3
- High school (or I got a GED) .....4
- Some college or community college, but I did not graduate from a four-year college... 5
- College graduate (from a four-year college or university) or more..... 6

**9. Which of the following best describes your current work status? (Please circle one):**

- Working full time..... 1
- Working part-time..... 2
- Unemployed ..... 3
- Looking for work.....4
- Stay at home mom..... 5
- Receiving disability..... 6

**10. How long have you lived in your neighborhood? (Please write a response):**

\_\_\_\_\_ years \_\_\_\_\_ months

**11. What is the name of the neighborhood you live in? (Please write a response):**

\_\_\_\_\_

**12. What is your annual family income before taxes? Please include income from all sources, including jobs, welfare, disability, unemployment, child support, interest, dividends, and support from family members. (Please circle one):**

- \$0 to \$15,000..... 1
- \$15,001 to \$19,000..... 2
- \$19,001 to \$22,000.....3
- \$22,001 to \$26,000.....4
- \$26,001 to \$30,000.....5
- \$30,001 to \$34,000..... 6
- \$34,001 to \$37,000..... 7
- \$37,001 to \$44,000..... 8
- More than \$44,001 ..... 9

**Tells us about the support you get from family and friends and how you feel about your neighborhood:**

**Please circle the best answer for you** (MSPSS; Zimet & Dahlem, PNS; Martinez, Black & Starr):

**13a. I get emotional support from my family:**

- Almost all of the time.....1
- Most of the time..... 2
- Half of the time..... 3
- Some of the time..... 4
- Almost none of the time..... 5

**13b. I can count on my friends when things go wrong:**

- Almost all of the time.....1
- Most of the time..... 2
- Half of the time..... 3
- Some of the time..... 4
- Almost none of the time..... 5

**14a. My neighborhood is a good place to live:**

- Strongly agree..... 1



Agree..... 2  
 Not sure..... 3  
 Disagree..... 4  
 Strongly Disagree..... 5

**14b. I have good access to public transportation in my neighborhood:**

Strongly agree..... 1  
 Agree..... 2  
 Not sure..... 3  
 Disagree..... 4  
 Strongly Disagree..... 5

**14c. The building and yards in my neighborhood are kept in good condition:**

Strongly agree..... 1  
 Agree..... 2  
 Not sure..... 3  
 Disagree..... 4  
 Strongly Disagree..... 5

**14d. There are good places (e.g., playground) for children to play in my neighborhood:**

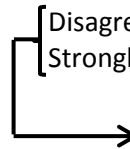
Strongly agree..... 1  
 Agree..... 2  
 Not sure..... 3  
 Disagree..... 4  
 Strongly Disagree..... 5

**14e. My neighborhood is a good place to raise a family:**

Strongly agree..... 1  
 Agree..... 2  
 Not sure..... 3  
 Disagree..... 4  
 Strongly Disagree..... 5

**15. I do most of my food shopping within my neighborhood (if you choose 4 or 5 go to 16a.):**

Strongly agree..... 1  
 Agree..... 2  
 Not sure..... 3  
 Disagree..... 4  
 Strongly Disagree..... 5



**15a. How far do you have to travel outside your neighborhood to do your food shopping?**

0-3 miles.....  
 1  
 4-7 miles.....  
 2  
 8-11 miles.....  
 3  
 11 or more miles.....  
 4

**Thank you for completing this survey!**

**APPENDIX C**

**NEIGHBORHOOD CONTEXT RECRUITMENT FLYER**

# Volunteers Needed for Research Study

We need participants for a research study:  
 “How does neighborhood environment affect women’s health while pregnant?”



**Description of Project:** We are interested in understanding how women’s neighborhoods affect their health, pregnancy and the birth of their child. You will participate in a 60 minute one-on-one interview over the phone or at an agreed upon location.

**To participate:** You must be between 21-40 years old, have lived in your current neighborhood at least 1 year and have delivered your baby within the past 12 months.

Participants will receive a \$10 gift card.

If you have questions or are interested in participating contact Key James, at 702-628-6809 or [ksj10@pitt.edu](mailto:ksj10@pitt.edu).

Key James (702) 628-6809 or <a href="mailto:ksj10@pitt.edu">ksj10@pitt.edu</a> Neighborhood Research Study
Key James (702) 628-6809 or <a href="mailto:ksj10@pitt.edu">ksj10@pitt.edu</a> Neighborhood Research Study
Key James (702) 628-6809 or <a href="mailto:ksj10@pitt.edu">ksj10@pitt.edu</a> Neighborhood Research Study
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Key James (702) 628-6809 or <a href="mailto:ksj10@pitt.edu">ksj10@pitt.edu</a> Neighborhood Research Study

This research has been reviewed and approved by the University of Pittsburgh’s Institutional Review Board.

## APPENDIX D

### NEIGHBORHOOD CONTEXT TELEPHONE SCREENING SCRIPT

Contextualizing neighborhood environment. Birth outcomes among women enrolled in the Women, Infants and Children (WIC) program in Allegheny County, PA.

Qualitative Interviews: Telephone Screening Script

PI: Key James

Thank you for calling about this research study. My name is Key James, and I am a graduate student and researcher at the University Of Pittsburgh School Of Public Health. For this research project, we are interested in understanding how women's neighborhoods affect their health, pregnancy and the birth of their child. As part of this research study, you will participate in a 60 minute one-on-one interview with me that can take place at your WIC office, over the phone or I can meet you someplace close to where you live or work. You will also be asked to complete a short questionnaire.

To thank you for your time in participating in this research study, you will receive a baby health and grooming kit and be entered into a drawing for a 50\$ gift card.

{Ask}: Do you think you might be interested in participating in this study?

{If No}: Thank you for your time.

**{If Yes}**: Thank you. I will now ask you some questions to see if you are eligible to participate in the study. You should know that all information that I receive from you by phone, including your name and any other identifying information, will be strictly confidential and not shared with anyone else.

Remember, your participation is voluntary; you do not have to answer these questions.

Do I have your permission to ask you these questions?

**{If Yes, ask}**:

1. <i>Are you or your infant/child currently receiving WIC benefits from the Allegheny County WIC program?</i>	{If Yes, move on} {If No, STOP}
2. <i>Are you African-American or White American?</i>	{If Yes, move on} {If No, STOP}
3. <i>Are you between the ages of 25-40?</i>	{If Yes, move on} {If No, STOP}
4. <i>Was your current baby born less than 1 year ago?</i>	{If Yes, move on} {If No, STOP}
5. <i>Do you live in the city of Pittsburgh?</i>	{If Yes, move on} {If No, STOP}
6. <i>Have you lived in your neighborhood for at least 5 years or more?</i>	{If Yes, move on} {If No, STOP}
7. <i>Was your baby born premature (&lt;37 weeks)?</i>	{If Yes, move on until 6 participants confirmed} {If No, move on until 6 participants confirmed}

**{If Not Eligible, or answers “No” to any of the questions above}**: Based on the information you gave me you are not eligible for this study. I appreciate you taking the time to talk to me. Do you have any further questions? **{End call}**

**{If Eligible}**: Based on the information you gave me you are eligible for this study.

**{Ask}**: Do you think you might be interested in participating in this study?

We can set up a day and time to meet for the interview. At the interview I will talk more about what to expect and you will complete a short questionnaire, and then you and I will have a discussion about your neighborhood and health. The entire study visit will take about 60 minutes.

Risks for participating in this research study are minimal. You may choose to answer or not answer questions based on your comfort level. Your participation in the study does not affect your WIC enrollment or services in any way. Benefits to you for participating are that you may gain insight into neighborhood conditions that may affect your health, pregnancy and childbirth. You will receive a baby health and grooming kit and be entered into a drawing for a \$50 gift card in appreciation for your time.

{**Ask**}: Do you have any questions?

{**Ask**}: Let's set up a date and time to complete this interview?

If you have any other questions please call me, the person conducting the study Key James, I can be reached at 702.628.6809.

## APPENDIX E

### NEIGHBORHOOD CONTEXT VERBAL CONSENT SCRIPT

- TITLE OF STUDY:** *Contextualizing neighborhood environment. Birth outcomes among women enrolled in the Women, Infants and Children (WIC) program in Allegheny County, PA.*
- PRINCIPAL INVESTIGATOR:** Keyonie “Key” James, Graduate Student  
130 De Soto St, Pittsburgh, PA 15261;  
Phone: 702.628.6809; e-mail: ksj10@pitt.edu
- FACULTY MENTOR:** Martha Ann Terry, Ph.D., Professor of Public Health  
130 De Soto St, Pittsburgh, PA 15261;  
Phone: 412-624-5887; e-mail: materry@pitt.edu

**Introduction:** Thank you for taking the time to complete this interview today. My name is Key James and I am a graduate student at the University of Pittsburgh’s School of Public Health. I will be conducting this interview.

**Information and Purpose:** The purpose of this interview is to understand through research how women in define and experience the neighborhood they live in, in efforts to learn more about how their neighborhood affects their health, pregnancy and the birth of their child.

**Your Participation:** For that reason, I will be interviewing women enrolled in the Allegheny County WIC program that have given birth recently and asking them questions about their neighborhood (e.g. safety, cleanliness, crime, housing, unemployment, schools,

friendliness). This interview will last for about 60 minutes. In addition, you will be asked to complete a brief survey (approximately 10 minutes) which will ask about your background, relevant medical history, neighborhood environment and health behaviors. In order to capture information accurately this interview will be audiotaped. You will receive a \$10 gift card in appreciation for your time.

**Benefits and Risks:** Risks for participating in this research are minimal however you may feel uncomfortable answering some questions. You may gain insight into neighborhood conditions which may affect your health, pregnancy and childbirth.

**Confidentiality:** Confidentiality: All information gathered will remain anonymous and you will not be asked to share any identifying information about yourself.

Your participation is voluntary. You may decline to answer any questions, and you may stop the interview at any time. This study is being conducted by Key James, who can be reached at 702.628.6809, if you have any questions.

Again, your participation here is voluntary. Do you agree to participate in this research?



**APPENDIX F**

**NEIGHBORHOOD CONTEXT ALLEGHENY COUNTY WIC SITE PERMISSION  
LETTER**

COUNTY OF



ALLEGHENY

RICH FITZGERALD  
COUNTY EXECUTIVE

WIC Program  
Investment Building, 6<sup>th</sup> floor  
239 Fourth Avenue  
Pittsburgh, PA 15222

January 23, 2014

Keyonic James  
0561 Rosemoor St. Apt. A  
Pittsburgh, PA 15217

Dear Mrs. James,

This letter confirms conversations between yourself and Carol Janesko regarding your request to recruit and conduct research at our WIC clinic locations in Allegheny County for your research study on neighborhood environment and birth outcomes among women enrolled in the Allegheny County Health Department WIC Program.

The WIC Program is committed to improving the nutritional health and well-being of mothers and children and believes that your research initiative will provide valuable insight into participant's perspectives of neighborhood conditions affecting their pregnancy and birth.

As part of this agreement, you will be permitted to recruit participants for your research study by posting flyers on the community bulletin boards of clinic sites and through face-to-face discussion with potential research subjects on site. When possible, interviews with selected research subjects may be conducted on site as long as these interviews do not interfere with the work of the staff and clinic, nor inconvenience WIC participants. We are willing to grant you permission to conduct your recruitment and research activities through January and February 2014; however, if you feel you may need more time to complete your efforts, we can revisit that request.

We are looking forward to working with you on this research study. If further questions or concerns arise please feel free to contact me or Carol Janesko.

Sincerely,

Patricia Waag  
412-350-4059  
[pwagg@achd.net](mailto:pwagg@achd.net)

Carol Janesko  
412-350-7238  
[cjanesko@achd.net](mailto:cjanesko@achd.net)

---

KAREN HACKER, MD, MPH, DIRECTOR  
ALLEGHENY COUNTY HEALTH DEPARTMENT  
955 RIVERMONT DRIVE • PITTSBURGH, PA 15207  
PHONE (412) 637-ACHD (2243) • FAX (412) 678-8328 • [www.achd.net](http://www.achd.net)

**APPENDIX G**

**NEIGHBORHOOD CONTEXT IRB APPROVAL**

[Print](#)[Close](#)

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From: [irb@pitt.edu](mailto:irb@pitt.edu)  
Sent: Fri 3/07/14 1:17 PM  
To: [ksj10@pitt.edu](mailto:ksj10@pitt.edu)



**University of Pittsburgh**  
*Institutional Review Board*

3500 Fifth Avenue  
Pittsburgh, PA 15213  
(412) 383-1480  
(412) 383-1508 (fax)  
<http://www.irb.pitt.edu>

**Memorandum**

To: Keyonie James  
From: Christopher Ryan, PhD, Vice Chair  
Date: 3/7/2014  
IRB#: [PRO13030621](#)  
Subject: Contextualizing Stress: How Pregnant African American women enrolled in the Women, Infants and Children (WIC) program in Allegheny County define and experience stress during pregnancy and over the life-course.

---

The above-referenced project has been reviewed by the Institutional Review Board. Based on the information provided, this project meets all the necessary criteria for an exemption, and is hereby designated as "exempt" under section 45 CFR 46.101(b)(2).

The IRB has approved the advertisement that was submitted for review as written. As a reminder, any changes to the approved advertisement would require IRB approval prior to distribution.

Please note the following information:

- If any modifications are made to this project, use the "Send Comments to IRB Staff" process from the project workspace to request a review to ensure it continues to meet the exempt category.
- Upon completion of your project, be sure to finalize the project by submitting a "Study Completed" report from the project workspace.

Please be advised that your research study may be audited periodically by the University of Pittsburgh Research Conduct and Compliance Office.

## BIBLIOGRAPHY

- Alio, A. P., Richman, A. R., Clayton, H. B., Jeffers, D. F., Wathington, D. J., & Salihu, H. M. (2010). An ecological approach to understanding black-white disparities in perinatal mortality. *Matern Child Health J*, 14(4), 557-566. doi: 10.1007/s10995-009-0495-9
- Allegheny County Health Department, Office of Epidemiology and Biostatistics. (2012). Allegheny County Mortality Report 2009-2010. Available at [http://www.achd.net/biostats/pubs/pdf/Mortality2009\\_2010.pdf](http://www.achd.net/biostats/pubs/pdf/Mortality2009_2010.pdf)
- Allegheny County Health Department, Office of Epidemiology and Biostatistics. (2013). Allegheny County Preliminary Natality Report 2011-2012. Available at [http://www.achd.net/biostats/pubs/pdf/2011\\_2012\\_natality\\_prelim.pdf](http://www.achd.net/biostats/pubs/pdf/2011_2012_natality_prelim.pdf)
- Allegheny County Health Department, Office of Epidemiology and Biostatistics. (2014). [City of Pittsburgh Neighborhood Infant Mortality Rate]. Unpublished Raw Data.
- Anachebe, N. (2006). Racial and ethnic disparities in infant and maternal mortality. *Ethnicity & Disease*, 71-76.
- Barnes, G. L. (2008). Perspectives of African-American women on infant mortality. *Soc Work Health Care*, 47(3), 293-305. doi: 10.1080/00981380801985457
- Blumenshine P., Egerter S., Barclay C. J., Cubbin C., Braveman P. A. (2010). Socioeconomic disparities in adverse birth outcomes: a systematic review. *Am J Prev Med*. 39(3):263-72
- Centers for Disease Control and Prevention. (2011, December 19). PRAMS and Smoking Data Tables. Retrieved from <http://www.cdc.gov>
- City of Pittsburgh, Department of City Planning. (2012). PGHSNAP Full Edition v.2. Available at [http://apps.pittsburghpa.gov/dcp/PGHSNAP\\_v2.02.pdf](http://apps.pittsburghpa.gov/dcp/PGHSNAP_v2.02.pdf)
- City of Pittsburgh, Department of City Planning. [Map]. Retrieved August 3, 2014. Available at: <https://pittsburghpa.maps.arcgis.com/apps/OnePane/basicviewer/index.html?appid=7b284a2998454505a6f000d24ee1ded5>
- Collins, J. W. & Butler, A. (1997). Racial differences in the prevalence of small-for-dates infants among college-educated women. *Epidemiology*, 315-317.

- Collins, J. W. & David, R. J. (1997). Urban violence and African-American pregnancy outcome: an ecologic study. *Ethn Dis*, 7(3), 184-190.
- Collins, J. W. David, R. J., Symons, R., Handler, A., Wall, S., Andes, S. (1998). African-American mothers' perception of their residential environment, stressful life events, and very low birthweight. *Epidemiology*, 9(3), 286-289.
- David, R., & Collins, J. (2007). Disparities in infant mortality: what's genetics got to do with it? *Am J Public Health*, 97(7), 1191-1197. doi: 10.2105/ajph.2005.068387
- Davis, E. M., Stange, K. C., & Horwitz, R. I. (2012). Childbearing, stress and obesity disparities in women: a public health perspective. *Matern Child Health J*, 16(1), 109-118. doi: 10.1007/s10995-010-0712-6
- Dole, N., Savitz, D. A., Hertz-Picciotto, I., Siega-Riz, A. M., McMahon, M. J., & Buekens, P. (2003). Maternal stress and preterm birth. *Am J Epidemiol*, 157(1), 14-24.
- Fielding J. E., Teutsch S., Breslow L. (2010). A framework for public health in the United States. *Public Health Reviews*. 32(1), 174-189.
- Ellen, I. G., Mijanovich, T., Dillman, KN. (2001). Neighborhood effects on health: Exploring the links and assessing the evidence. *Journal of Urban Affairs*, 23(3-4), 391-408.
- Geronimus, A. T. (1996). Black/white differences in the relationship of maternal age to birthweight: a population-based test of the weathering hypothesis. *Soc Sci Med*, 42(4), 589-597.
- Giurgescu, C., Banks, A., Dancy, B. L., & Norr, K. (2013). African American women's views of factors impacting preterm birth. *MCN Am J Matern Child Nurs*, 38(4), 229-234. doi: 10.1097/NMC.0b013e318293bbbb
- Giurgescu, C., Kavanaugh, K., Norr, K. F., Dancy, B. L., Twigg, N., McFarlin, B. L., White-Traut, R. C. (2013). Stressors, resources, and stress responses in pregnant African American women: a mixed-methods pilot study. *J Perinat Neonatal Nurs*, 27(1), 81-96. doi: 10.1097/JPN.0b013e31828363c3
- Giurgescu, C., Zenk, S. N., Dancy, B. L., Park, C. G., Dieber, W., & Block, R. (2012). Relationships among neighborhood environment, racial discrimination, psychological distress, and preterm birth in African American women. *J Obstet Gynecol Neonatal Nurs*, 41(6), E51-61. doi: 10.1111/j.1552-6909.2012.01409.x
- Green, J., Thorogood, N. (2009a). Analysing Qualitative Data *Qualitative Methods for Health Research* (Second ed., pp. 195-228). Thousand Oaks, CA: SAGE Publications Ltd.
- Green, J. Thorogood, N. (2009b). In-depth Interviews *Qualitative Methods for Health Research* (pp. 93-112). Thousand Oaks, CA: SAGE Publications Ltd.

- Hogue, C. J., & Bremner, J. D. (2005). Stress model for research into preterm delivery among black women. *Am J Obstet Gynecol*, *192*(5 Suppl), S47-55. doi: 10.1016/j.ajog.2005.01.073
- Hogue, C. J., Hoffman, S., & Hatch, M. C. (2001). Stress and preterm delivery: a conceptual framework. *Paediatric and Perinatal Epidemiology*, *15*(2 Suppl), 30-40.
- Holzman, C., Eyster, J., Kleyn, M., Messer, L. C., Kaufman, J. S., Laraia, B. A., Elo, I. T. (2009). Maternal weathering and risk of preterm delivery. *Am J Public Health*, *99*(10), 1864-1871. doi: 10.2105/AJPH.2008.151589
- Institute of Medicine, Division of Health Promotion and Disease Prevention. (1985). *Preventing Low Birthweight*. Washington, DC: National Academies Press.
- Jackson, F. M., Phillips, M. T., Hogue, C. J., & Curry-Owens, T. Y. (2001). Examining the burdens of gendered racism: implications for pregnancy outcomes among college-educated African American women. *Matern Child Health J*, *5*(2), 95-107.
- Lazarus, R., Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer Publishing.
- Link, B. G., & Phelan, J. (1995). Social conditions as fundamental causes of disease. *J Health Soc Behav, Spec No*, 80-94.
- Love, C., David, R. J., Rankin, K. M., & Collins, J. W., Jr. (2010). Exploring weathering: effects of lifelong economic environment and maternal age on low birth weight, small for gestational age, and preterm birth in African-American and white women. *Am J Epidemiol*, *172*(2), 127-134. doi: 10.1093/aje/kwq109
- Lu, M. C., & Halfon, N. (2003). Racial and Ethnic Disparities in Birth Outcomes: A Life-Course Perspective. *Maternal and Child Health Journal*, 13-29.
- MacDorman, M. F., Hoyert, D. L., & Mathews, T. J. (2013). Recent declines in infant mortality in the United States, 2005-2011. *NCHS Data Brief* (120), 1-8.
- March of Dimes. (2014). Quick Facts: Pittsburgh, Preterm Birth. Retrieved May 15, 2014, from <http://www.marchofdimes.com/peristats/ViewTopic.aspx?dv=lt&reg=4261000&top=3&lev=0&slev=5>
- Martin, J. A., Hamilton, B. E., Ventura, S. J., Osterman, M. J., & Mathews, T. J. (2013). Births: final data for 2011. *Natl Vital Stat Rep*, *62*(1), 1-70.
- McEwen, B. S. (1998). Stress, adaptation, and disease. Allostasis and allostatic load. *Ann NY Acad Sci*, *840*, 33-44.

- Mendez, D. H., Vijaya; Culhane, Jennifer. (2014). Institutional racism, neighborhood factors, stress, and preterm birth. *Ethnicity & Health*, 5, 479-499. doi: 10.1080/13557858.2013.846300
- Metcalfe A., Lail P., Ghali W. A., Sauve R.S. (2011). The association between neighbourhoods and adverse birth outcomes: a systematic review and meta-analysis of multi-level studies. *Paediatr Perinat Epidemiol*. 25(3):236-45.
- Messer, L. C., Laraia, B. A., Kaufman, J. S., Eyster, J., Holzman, C., Culhane, J., O'Campo, P. (2006). The development of a standardized neighborhood deprivation index. *J Urban Health*, 83(6), 1041-1062. doi: 10.1007/s11524-006-9094-x
- Nkansah-Amankra, S., Luchok, K. J., Hussey, J. R., Watkins, K., & Liu, X. (2009). Effects of Maternal Stress on Low Birth Weight and Preterm Birth Outcomes Across Neighborhoods of South Carolina, 2000-2003. *Maternal Child Health Journal*, 14(2), 215-226.
- O'Campo, P., Xue, X., Wang, M. C., & Caughy, M. (1997). Neighborhood risk factors for low birthweight in Baltimore: a multilevel analysis. *Am J Public Health*, 87(7), 1113-1118.
- Patton, M. Q. (1990). The Nature of Qualitative Inquiry *Qualitative Evaluation and Research Methods* (pp. 3-30). Newbury Park, CA: SAGE Publications Ltd.
- Phelan, J. C., Link, B., Diez-Roux, A., Kawachi, I., Levin, B. (2004) "Fundamental Causes" of Social Inequalities in Mortality: A Test of the Theory. *Journal of Health and Social Behavior*, 45(3), 265-285.
- Rich-Edwards, J. W., & Grizzard, T. A. (2005). Psychosocial stress and neuroendocrine mechanisms in preterm delivery. *American Journal of Obstetrics and Gynecology*, 30-35.
- Ross, C. E., Jang, S. J. (2000). Neighborhood Disorder, Fear, and Mistrust: The Buffering Role of Social Ties with Neighbors. *American Journal of Community Psychology*, 28(4), 401-420.
- Ross, C. E., Mirowsky, J. (1999). Disorder and Decay. The Concept and Measurement of Perceived Neighborhood Disorder. *Urban Affairs Review*, 34(4), 412-432.
- Russell, R. B., Green N. S., Steiner, C. A., Meikle, S., Howse, J. L., Poschman, K., Dias, T., Potetz, L., Davidoff, M. J., Damus, K., Petrini, J.R. (2007). Cost of hospitalization for preterm and low birth weight infants in the United States. *Pediatrics*, 120(1), 1-9.
- Seleye, H. (1956). *The Stress of Life*. New York: McGraw-Hill Companies, Inc.
- Stancil, T. R., Hertz-Picciotto, I., Schramm, M., & Watt-Morse, M. (2000). Stress and pregnancy among African-American women. *Paediatr Perinat Epidemiol*, 14(2), 127-135.



- U.S. Census Bureau. (2013). Finding Data For My Community. Available at <http://www.census.gov/geo/education/pdfs/brochures/MyCommunity.pdf>
- U.S. Department of Agriculture, Food and Nutrition Services. (2014). WIC: The Special Supplemental Nutrition Program for Women, Infants and Children. Available at <http://www.fns.usda.gov/sites/default/files/WIC-Fact-Sheet.pdf>
- U.S. Department of Health and Human Services, Maternal and Child Health Bureau. (2011). Child Health USA 2011. Available at <http://mchb.hrsa.gov/chusa11/hsfu/pages/312pc.html>
- U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration. (2012). Substance Use during Pregnancy Varies by Race and Ethnicity. Available at <http://www.samhsa.gov/data/spotlight/Spot062PregnantRaceEthnicity2012.pdf>