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THE TIMELY USE OF PRENATAL CARE AND ITS EFFECTS ON BIRTH OUTCOMES IN BLACK WOMEN OF LOW SOCIOECONOMIC STATUS IN THE SOUTH

by

PAMELA VANNETT DANIELS

Under the Direction of Erin Ruel

ABSTRACT

Despite substantial evidence linking improved pregnancy outcomes with receipt of prenatal care and recent improvements in prenatal care utilization, specific subpopulations continue to receive late prenatal care and experience adverse birth outcomes. This study will use the Health Belief Model and the Intersectionality Framework to examine the timing of prenatal care utilization, prenatal care compliance, and adverse birth outcomes within a group of low-income, black women in the South. Black women have worst rates of late prenatal care utilization and compliance than any other racial group. This late prenatal care utilization and compliance leads to adverse birth outcomes. A secondary data analysis was conducted using binary logistic regression and OLS regression to examine agency factors, structural factor, and risk health behavior in predicting timing of prenatal care utilization and compliance. In addition, this study also examines timing of prenatal care utilization and compliances and its effects on preterm birth and low birth weight. The results show that family size and knowledge/attitude significantly influences timing of prenatal care. Prenatal care compliance is influenced by church social support and low birth weight is influenced by private insurance. The results of this study show that although much is known in comparing different racial groups, more investigation is needed to explain why low income black women still experience less prenatal care use and compliance and worse adverse birth outcomes than any other racial group in the United States.

INDEX WORDS: Prenatal care utilization, Prenatal care compliance, Preterm births, Low birth weight, Black, Women, South, Low socioeconomic status

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PAMELA VANNETT DANIELS

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of

Doctor of Philosophy

In the College of Arts and Sciences

Georgia State University

2011

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Pamela Vannett Daniels
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by

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College of Arts and Sciences

Georgia State University

May 2011

DEDICATION

In loving memory of my Grandmother, Lucy Bell Martin. Your wisdom and strength inspired me to believe that I can do anything. Although you are gone, I feel your presence with me everyday encouraging me to do my best. I watched you struggle so that I wouldn't have too. I love and miss you.

ACKNOWLEDGEMENTS

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have taught me that it is alright to dream dreams that no one else can see and to think and dream on a global level. Your humanitarian efforts inspire me to dream of a better world. I love you now and forever.

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CHAPTER 1:

INTRODUCTION

Statement of the Problem

Every year in the United States there are four million births. Although the greatest proportion of these babies is healthy, there are still over 40,000 infant deaths each year (David & Lucille Foundation, 2009). High rates of infant mortality (i.e., deaths under age of 1 year of birth) in the United States have been linked to many factors. The most important factors that lead to infant mortality are the increased number of preterm births (born less than 36 weeks gestation) and babies born with low birth weight (infants weighing <2500grams or 5 lbs, 8 ounces) and very low birth weight (VLBW). Three-quarters of all infants' deaths are due to babies being born too small or too soon. Infants who are born with low birth weight are 40 times more likely to die during the first 28 days of life than an infant of normal weight (CDC, 2010). Infants born preterm have a better survival rate but they also have higher rates of birth defects, developmental delays, and other health issues that can affect them into adulthood.

The thought of babies dying in America needlessly before their first birthday is alarming, given the advancement of medical sciences over the past century. Every day in the United States, over 11,000 babies are born. Of these births, over 1,300 are born preterm (11.8%) and almost 1,000 (9.1%) are born with low birth weight (March of Dimes, 2010). The high rates of adverse birth outcomes of low birth weight, premature births and infant mortality have been persistence over the last four decades.

Although these issues surrounding adverse birth outcomes remain constant, the use of early prenatal care has proven to be an important factor in improving birth outcomes. However, the use of prenatal care has been hindered by race, class, gender, neighborhoods and other

agency and structural issues that have obstructed access and timing of prenatal care utilization and compliance that exacerbates these adverse birth outcomes for black women in comparison to their white counterparts. This is a critical piece of the puzzle as the racial divide widens for adverse birth outcomes and prenatal care use.

Historical Events

There are many historical and contemporary issues that have shaped healthcare for minorities groups especially blacks. These issues range from lack of access to healthcare, competing needs (i.e. choosing food, housing and other necessities over healthcare needs), lack of trust and other pressing issues. Braithwaite and Taylor's book, *Health Issues in the Black Community (1992),* addresses these issues with a supporting cast of key health disparity researchers that offer a discussion and possible explanation for continued gaps in healthcare for the minority population. Byllye Avery makes a profound statement in that "the health of one's mother begins with her mother's mother" (Braithwaite &Taylor, 1992 p. 39). This statement suggests that there is an intergenerational health pattern that is deeply rooted in historical events that have shape and fueled old ideologies and beliefs that have been passed down from generation to generation. Historically, the treatment of minority groups in the United States has been seeded in racism and discrimination which has led to lack of trust and respect for the government, the institution of healthcare, and healthcare providers (Bosher & Pharris, 2008; Cowen, 2009; Hill, 2007).

Several studies that focus on health disparities have centered on the lack of trust in the healthcare system by minority communities. Events such as the Tuskegee Syphilis Experiment have set up a continuum of distrust and disrespect of how African Americans view white

physicians and the government in general. This study is often cited by African Americans (young and old) when asked why they do not trust healthcare officials and the government (Beech and Goodman, 2004). This study alone can lay the foundation for health disparities because of the lasting affects it has on minorities accessing care, trusting providers, and utilizing services provided by government agencies.

Birth outcomes among minorities, especially black women are deeply affected by historical events. As far back as the slave trade, fathers have been either sold to increase capital for the slave traders or killed leaving the mother to take care of her and the children. The effect that slavery has had on health has been theorized as the Slave Health Deficit (Byrd & Clayton, 2000). Byrd and Clayton argue that slavery is where health disparities originated and was nourished (Williams, 2007). In today's society, we see black men going to jail or even being gunned down in the streets due to racial profiling, drugs, violence and other social ills. With all these factors playing a role in the lives of African American women, accessing healthcare in general, prenatal care, and other services to take care of themselves has been self reported in studies as being nearly last on their list of priorities (Lane, 2003) . This leads to late or no prenatal care, adverse birth outcomes and increased infant mortality. Those infants who are lucky enough to survive experience worse health across their life course (Quarles, 1987; Smith, 1999; Beech and Goodman, 2004).

Health Disparities

Health disparities are defined as differences between groups based on race/ethnicity, socioeconomic status and gender. Groups showing disparities are those who have persistently experienced social disadvantage or discrimination and who systematically experience worse

health or greater health risks than more advantaged social groups (Braveman, 2005). The health status of minority populations in the U.S. are far worse that the health status of the white population (LaVeist, 2005). Despite improvements, differences persist in health care quality among racial and ethnic minority groups, individuals living in poverty, and those who have a low socioeconomic position often suffer disproportionately from poor health outcomes both nationally and around the world (LaVeist, 2005; Braveman, 2005).

Health disparities in the United States often highlight large social and geographic disparities in life expectancy that cannot be solely explained by race, income and basic access to healthcare (Murray et al 2006). These disparities include many social factors such as living environment, employment, education, and social support that are all intersecting to disproportionately affect the health of poor and minority populations (Williams et al, 2008). Between 2000 -2005, some health disparities, including adverse birth outcomes and access to prenatal care, have worsened or remained unchanged (AHRQ, 2008).

Infants born prematurely or of low birth weight oftentimes face birth defects, health challenges and social issues that can lead to limited educational attainment, a continuation of the cycle of poverty, single parent homes once they are parents, limited employment, and other stressful life events that can lead to poor health outcomes (Johnson, 2007). These issues have been linked back to adverse birth outcomes and their effects over the life course (Johnson, 2007). This cycle of adverse birth outcomes is likely to repeat itself in successive generations.

Health Disparities in Prenatal Care

Even though there has been some enthusiasm generated by the improvements in prenatal care use, there is still great concern that not all racial, ethnic, and socioeconomic groups have

equally experienced these gains. Women at greater risk for adverse birth outcomes, such as African American women, have seen less improvement in their access to and use of prenatal care (Alexander, Kogan, Nabukera, 2002; Misra & Guyer, 1998). African American women and women with less education have been highlighted as specific groups in which trends toward more favorable prenatal care use has lagged behind other comparison groups. This is particularly true for intensive or compliant use to recommend prenatal care content. This is particularly important because the disparity in late or no prenatal care use between whites and blacks has continued to widen and racial disparities in infant mortality continues to grow (MMWR, 2000).

For this racial group, better birth outcomes are the health disparity. This is illustrated by the fact that although adverse birth outcomes are higher among black women of low socioeconomic status, black women who are college-educated and earn more money have higher rates than their white counterparts as well. This leads to two questions, if over the past 40 years infant mortality has decreased or stagnated among some U.S. racial groups, how do we explain the increase among black women and the over doubled rates of infant mortality, preterm birth, and LBW among this group? And how do we explain how women who are born in developing countries with limited healthcare come to the United States and have better birth outcomes than black women of lower socioeconomic status?

The Prenatal Debate

Many researchers in the field of public health have debated the causes of adverse birth outcomes (low birth weight, preterm births, and infant mortality) for many years, dating back to the early 1900s, and have tried to determine the best solutions to eliminate these poor birth

outcomes. The most recent recommendations are that pregnant women should obtain prenatal care in the first trimester (within the first 12 weeks of pregnancy) and throughout the duration of their pregnancy, especially those at greater risk for these adverse birth outcomes. Prenatal care can be described as a set of services provided to improve pregnancy outcomes and engage the expectant mother, other members of her family, and her friends in the healthcare decisions.

Although there is still some disagreements among researchers about the specific components of prenatal care that impact favorable birth outcomes, it is increasingly clear that health professionals, social scientists, and behavioral scientists all agree that a healthy prenatal environment plays a key role in influencing and determining healthy birth outcomes. A healthy prenatal *environment* consists of not just standard traditional prenatal care, but also includes non-medical factors such as social environment, stressful life events brought on by social constructs (i.e. race, class, and gender), social environment, social support, and other health behaviors such as smoking and substance abuse. All these factors intersect to influence the choices of women to seek and receive timely prenatal care. Access and timing of prenatal care is particularly important because black women, who need these services the most, are utilizing them the least, which will have an impact on the overall health of United States as a nation.

Health Disparities in Birth Outcomes

For several decades, black infants have had significantly worse birth outcomes than white infants. The causes of these persistent racial disparities remained poorly explained. Much of the research on this topic has focused on differential exposures to protective and risk factors during pregnancy such as prenatal care, socioeconomic status, maternal risk behaviors, psychosocial stress, etc. These studies offer some plausible explanations for persistence of adverse birth

outcomes; however, they do not provide a complete picture. These studies provide very little information on the lived experiences of women who are at greatest risk for preterm births, low birth weight and infant mortality ((Lu Halfon, 2003). Although adequate prenatal care has been accepted as a reasonable solution to adverse birth outcomes, significant disparities in prenatal care use remains due in large part to access to prenatal services, location of prenatal services, and compliance with prenatal care standards and recommendations during pregnancy.

Trends

Until recently, the United States had experienced a decrease in infant mortality. Despite this dramatic change, the United States remains in a very disadvantaged position among industrialized countries when they are ranked by infant mortality rates. The United States is ranked 45th in comparison to both developed and undeveloped countries (NVS, 2009). This is disturbing because infant mortality rates are the indicators of the health of the US as a nation. While there has been stagnation in the decrease of infant mortality among all racial groups as a whole, there have been some increases in infant mortality rates among individual racial groups. This increase is highly persistent among black women who also see an increase among premature births and low birth weight. Many researchers and medical professional believe that early utilization of prenatal care will decrease the constant rise in low birth weight and premature deliveries which would ultimately decrease the infant mortality rate among at risk groups (US Expert Panel on Prenatal Care, 1989).

Research Agenda

In this dissertation, I will use the intersectionality framework (based on Intersectionality Theory) as my foundation to argue that although the disparities in the utilization of early prenatal care are important, there are some preexisting social constructs that intersect in the lives of black women that play a substantial role in their health beliefs, behavior, choice and ultimately health outcomes. These social constructs are race, class and gender. Race, class, and gender all intersect in and collide with other barriers or maternal stressors, such as knowledge/attitude, financial strain, stigma, social support, family size, and risk health behavior that lead to late prenatal care use and adverse birth outcomes. These maternal stressors are all key factors in predicting timeliness of prenatal care, adverse birth outcomes, and prenatal care compliance in this sample of Southern, lower class, black women.

This study is important because we know that there is a black-white gap when examining prenatal care use, compliance, and birth outcomes, however little to no research has been done to examine these issues within the racial group that has the worst birth outcomes. This with-in group design encourages further exploration of the diversity of perceptions, experiences, and attitudes among black woman about prenatal care use and compliance and adverse birth outcomes.

This social patterning of health is important for a number of reasons. The size of the gap between the mortality rates of the most and least advantaged groups gives some indication of the potential for improvement in a nation's health. Identification of the groups who are at greatest risk of poor health can inform sound governance of medical services. Most interestingly, perhaps, the graded relationship between health and social position can suggest hypotheses concerning the etiology of both specific diseases and all-cause mortality. Finally, understanding

the causes of social variations in health should lead to intervention strategies which can reduce and eventually lead to a reduction in infant mortality rates.

In addition, this dissertation will test the health belief model, which is an offshoot of rational choice theory, to explain timing of prenatal care usage, compliance, and birth outcomes for this group intersected by race, class and region. Although the health belief model examines belief and behavior, it does not examine or explain the psychosocial reasons that lead to these beliefs or behaviors. Therefore, sociological theories can add tremendously to the understanding of race, class, gender, and choices in explaining disparities in the use of prenatal care and its consequences on birth outcomes. Using intersectionality framework as the foundation (intersection of race, class, and region), I will develop a new conceptual model using maternal stressors to explain why black women do not seek or obtain early prenatal care. This model will also seek to explain why health disparities and societal inequalities lead to adverse birth outcomes.

Both the intersectionality framework and the Health Belief Model can be used in health disparities research to examine how the intersection of race, class, gender can affect birth outcomes in black women. In addition, this study will examine how the agency factors, structural factors, risk health behavior and other factors in communities where black women of low socioeconomic reside lead to late use of prenatal care and noncompliance as well as birth outcomes. These theories provide a foundation to explain how preexisting conditions in society can have an effect on one’s beliefs and the choices that they make.

Agency Factors

Agency is defined as the capacity of individuals to act independently and to make their own free choices (Barker, 2005). These independent choices are important for women seeking healthcare services when upon initial discovery of their pregnancy and being compliant to receive all recommended prenatal care services until birth. The agency factors that will be examined in this study are knowledge/attitude about pregnancy and prenatal care, social support (church, and neighborhood), and family size (combining all adults and children in the household).

Structural Factors

Structural factors are recurrent patterned arrangements which seem to influence or limit the choices and opportunities that individuals possess (Barker, 2005). Structural factors can be the healthcare system, education system, employment opportunities, etc. The structural factors that will be used in this study are financial strain, Medicaid, private insurance, and stigma.

Contribution to the Literature

This dissertation has the potential to provide an explanation for why black women of low SES do not seek timely prenatal care or adhere to recommended prenatal care content which ultimately has an effect on preterm birth, low birth weight and ultimately infant mortality. From prior comparative studies we know that structural factors such as access to care, financial strain, insurance status, and stigma associated with number of pregnancies are predictive of worse birth outcomes for black women compared to white women, and we know these structural factors are predictive of prenatal care disparities between black and white women. What is not known is

what variation within the group intersected by race class and gender explains variation in prenatal care utilization and birth outcomes. In addition, this dissertation will add to the increasing importance of interdisciplinary research by combing sociology and public health theories to provide a detailed explanation for the limited or lack of prenatal care use among black women despite the possibilities of adverse birth outcomes. This study is important because of the recent rise in preterm births, low birth weight, and infant mortality among black women.

This dissertation will answer the following questions: 1) what effects do agency factors (knowledge/attitude, social support (church, neighborhood, and family), and family size (adults and children) have on timing of prenatal care use and compliance and birth outcomes (preterm birth and low birth weight) among Southern black women of low SES? 2) what effect does structural factors (financial strain, Medicaid, private insurance, and stigma) have on timing of prenatal care use and compliance and birth outcomes (preterm birth and low birth weight) among Southern black women of low socioeconomic status obtain early or late prenatal care? 3) What effect does risk health behavior play on timing of prenatal care use and compliance and birth outcomes (preterm birth and low birth weight) among Southern black women of low socioeconomic statuses? And 4) what effect does timing of prenatal care use and compliance play on birth outcomes? In Chapter 2, I present an in-depth literature review of racial health disparities and what we know about racial disparities in access to health care. I then focus in on infant health and adverse birth outcomes and prenatal care services.

The next section develops a more nuanced theoretical model to explain poor black women's reduced use of prenatal care. Chapter 3 presents the study's research design, data, measures and analytic strategy for the secondary data analysis on both the cross sectional survey and administrative data sets. Chapter 4 presents descriptive statistics about the study population

and how the variables are correlated by bivariate analysis. In Chapter 5, I will present an analysis of the agency and structural factors, and risk health behavior that predicts why black women seek late prenatal care using binary logistic regression and prenatal care compliance using OLS regression. Chapter 6 will present the analysis of birth outcomes (low birth weight and preterm birth) predicted by agency and structural factors, risk health behavior and as a function of timing of prenatal care and of prenatal care compliance (using binary logistic regression). Finally, Chapter 7 will provide a discussion of the implications, limitations and recommendations based on the study results.

CHAPTER 2:

LITERATURE REVIEW

Prenatal care has been instrumental in reducing infant mortality rates through reducing incidences of preterm birth and low birth weight. In this literature review, I will first provide a brief history of infant mortality, preterm birth and low birth weight. I will break out these birth outcomes by race, socioeconomic status, region, and locale separately and together. Next, I will introduce typical public health explanations for increased adverse birth outcomes among black women, which have several shortcomings. These shortcomings can be critically addressed with the intersectionality framework.

I will then introduce my conceptual model using the intersectionality framework, and the Health Belief Model, a form of Rational Choice Theory. The intersectionality framework will be used to justify a focus within race, social class, and gender classifications, as these factors together play a key role in one's health beliefs and resultant behaviors. In this model, I examine specifically maternal stressors, attitudes/knowledge, stigma, financial strains, private insurance, Medicaid, social support, health risk behavior and family size.

Infant Mortality

Infant mortality has been defined as a baby born live that dies before its first birthday. It is measured as a rate of death in a particular time period, within a particular region, per 1,000 live births. Public health professionals view infant mortality as "a measure of community health, economic efficiency, collective moral well being, and future military strength" (Szreter**,** 2003; Brosco, 1999). In fact, infant mortality is one of the most important indicators of the health of a nation, as it is associated with a variety of factors such as maternal health, quality and access to

medical care, socioeconomic conditions, and public health practices (Mathews & MacDorman, 2008a).

In 1900, the U.S. infant mortality rate was approximately 100 infant deaths per 1,000 live births. By 1995, the rate was 7.57 per 1,000 live births and by 2000; the rate was 6.9 infant deaths per 1,000 live births (MacDorman & Mathews, 2008b). This demonstrates a significant improvement in health over the last century attributable in large part to increasing use of prenatal care and improved and better access to healthcare. (MacDorman & Mathews, 2008b).

Despite this dramatic improvement, the United States remains in a very disadvantaged position among industrialized countries when they are ranked by infant mortality rates. The United States is ranked 45th in comparison to both developed and developing countries (CIA-World Factbook, 2009). The countries with the lowest infant mortality rates are Singapore (2.31) and Bermuda (2.46), first and second respectfully out of 224 countries. The U.S. may be trailing because the U.S. infant mortality rate did not decline significantly between 2000 and 2005. This has generated concern among researchers and policy makers leading to research to understand where the problem lies (MacDorman & Mathews, 2008, 2009).

One possible direction is to examine racial differences in infant mortality rates. According to the Centers for Disease Control and Prevention's National Center for Health Statistics (2010), “Infant Mortality Statistics from the 2006 Period Linked Birth/Infant Death Data Set,” there are also racial and ethnic disparities in infant mortality rates. Non-Hispanic black women had the highest infant mortality rate in the United States in 2006 – 13.35 per 1,000 live births compared to 5.58 per 1,000 births among non-Hispanic white women (Figure 2.1) (MacDorman & Mathews, 2010). Women of Central and South America descent in the United States had the lowest infant mortality rate of 4.55 per 1,000 live births while Asian Pacific

Islanders had the second lowest rate of 4.52 per 1,000. It's clear we need to target the group with the highest infant mortality rates if we want to further reduce overall infant mortality rates.

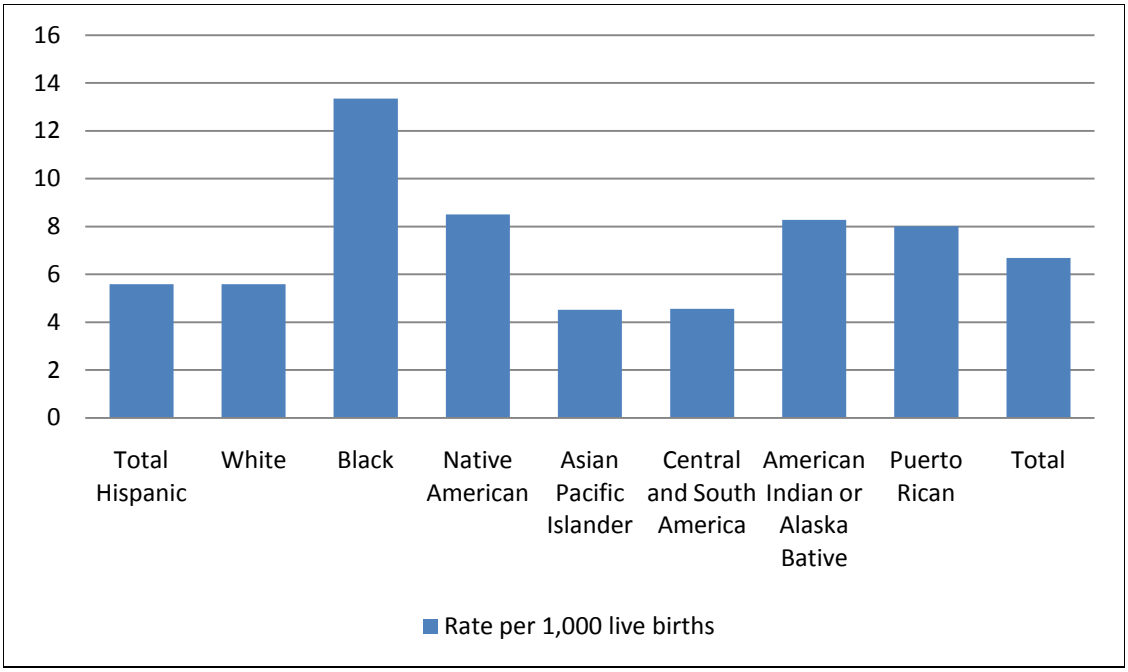

Figure 2.1 Infant Mortality Rates (per 1,000 live births) by Race and Ethnicity, United States, 2006 Average

Infant mortality by Socioeconomic Status

There is a striking consistency in the distribution of mortality and morbidity between social groups. The more advantaged groups, whether expressed in terms of income, education, social class or ethnicity, tend to have better health than the other members of their societies. The distribution is not bipolar (advantaged vs the rest) but graded, so that each change in the level of advantage or disadvantage is in general associated with a change in health (Blane, 1995).

Infant Mortality by Region

Infant mortality rates may also differ by region of the country. In the Southern Region of the United States, the infant mortality rates for the 2003-2005 almost mirror the U.S. rates. In

this region over 12,000 infants died before reaching their first birthday with and overall infant mortality rate, higher than the national average, of 7.8 per 1,000 live births. Regional findings show that the southern region has the highest infant mortality rates among all regions (March of Dimes, 2006).

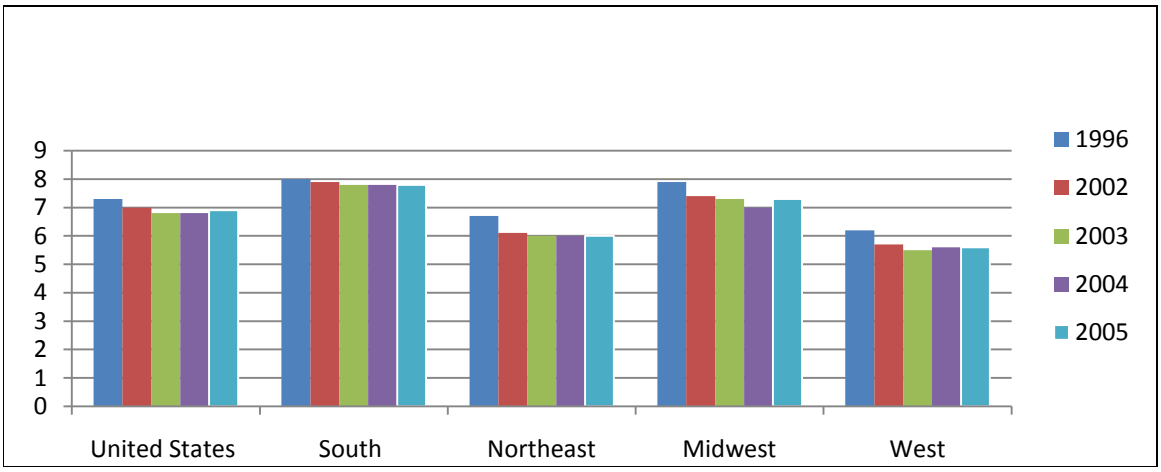

Figure 2.2 Infant Mortality Rates by Regions in the United States 2003-2005

Infant Mortality in Atlanta, GA

This study is situated in Georgia, which is within the Southern Region of the U.S. In Fulton and DeKalb County, GA, the locations for this study, rates of infant mortality lower (meaning better) than the national average. However, within these counties, the rates of infant mortality for African American women are triple the rates of that of white women, suggesting serious inequalities. Figure 2.3 illustrates the difference in infant mortality rates in 2006 for the U.S, Southern Region, Georgia and DeKalb County, GA and Fulton County, GA.

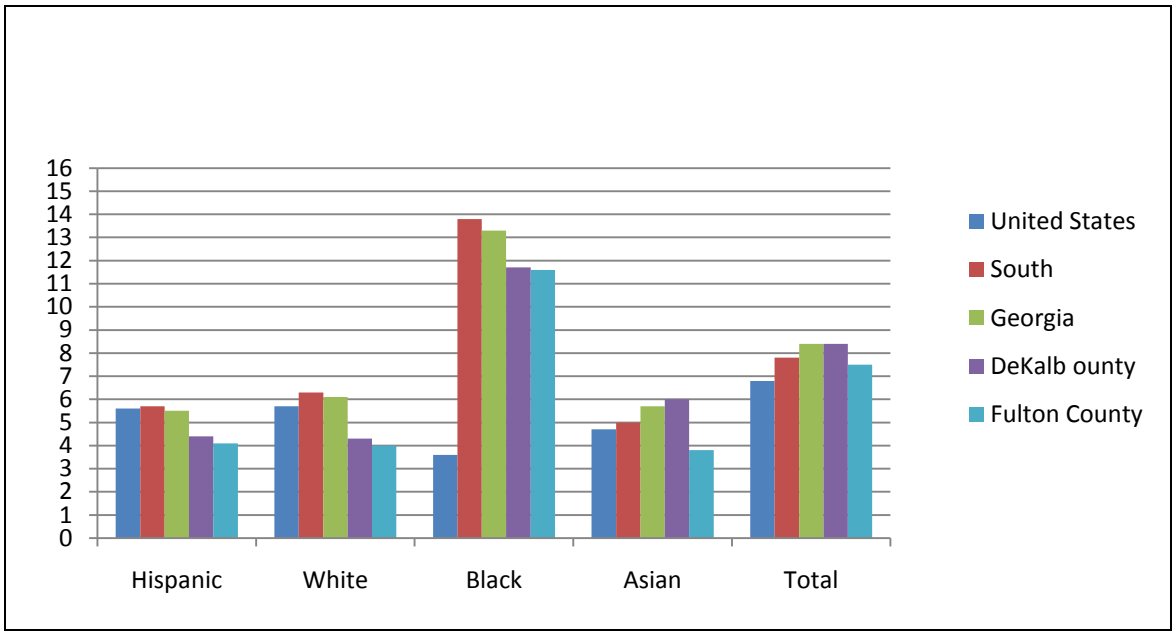

Figure 2.3 Comparison of Infant Mortality Rates: United States, Southern Region, Georgia, Fulton and DeKalb County (2006)

In 2008, The Department of Community Health along with health experts from across the state of Georgia developed the *2008 Georgia Health Disparities Report*. This report is a critical first step in working together to eliminate health disparities in Georgia. Each county, within the state of Georgia, received a grade for access to and quality of healthcare services, rates of certain health issues, etc. and their affect on health disparities. Fulton and DeKalb Counties both received a grade of D (based on A through F +/- system) for prenatal care use and birth outcomes. For DeKalb County, 11.8% of the African American population live below the poverty level and but less than 4% (3.9%) have less that a 9th grade education with an unemployment rate of 7.4%. In comparison, Fulton County has 26.5% of its African American population living below the poverty level and 6.8% of this population have less than a 9th grade education with an unemployment rate of 13.1%.

The Healthy People 2010 objectives and now 2020 objectives have identified reduction of the U.S. infant mortality rate as a national priority (NCVS, 2010). After years of significant decline, however, there has been minimal progress in recent years; in 2002, national statistics demonstrated the first increase in the infant mortality rate since 1958 (Kochanek & Martin, 2005; Callaghan et al, 2006). Policies aimed at improving infant survival rates must be informed by a thorough understanding of the factors contributing to infant mortality rates. Infant mortality has been linked to several perinatal issues with the two prevalent health conditions being preterm birth (majorcause) and low birth weight (second major cause) (Lumley, 2003).

Preterm Birth

Preterm birth is defined as babies born at less than 36 completed weeks of gestation (NCVS, 2009). This means that babies are born before they are fully developed. Low birth weight is defined as infants born with a birthweight less than 2500 grams or 5 pounds 8 ounces (CDC, 2008). Between 1996 -2006, the preterm birth rate in the United States increased more than 16%. Pre-term infants are 70 times more likely to die than infants born at term (37 to 41 weeks) (Matthews et al, 2009).

There are inequalities in preterm birth rates by race. Preterm birth rates are higher among minority groups. In fact, from 2000 to 2005, preterm related infant mortality rates increased significantly ($p<0.05$) for the total population and for non-Hispanic white, non-Hispanic black, Hispanic, Asian/Pacific Islander, and Mexican women (MacDorman & Mathews, 2008). In 2005, preterm-related infant mortality rates were approximately three times higher for non-Hispanic black women (6.26) and nearly twice as high for Puerto Rican woman (3.44) compared with rates for non-Hispanic white women (1.84) (MacDorman & Mathews , 2008). Rates for

American Indian/Alaska Native, Mexican, Asian/Pacific Islander, and Central and South American women were similar to the rate for non-Hispanic white women. In 2005, 36.5% of all infant deaths in the United States were attributed to preterm-related causes (MacDorman & Mathews, 2008). Figure 2.4 below is an illustration of preterm birth rates by race in 2004-2006.

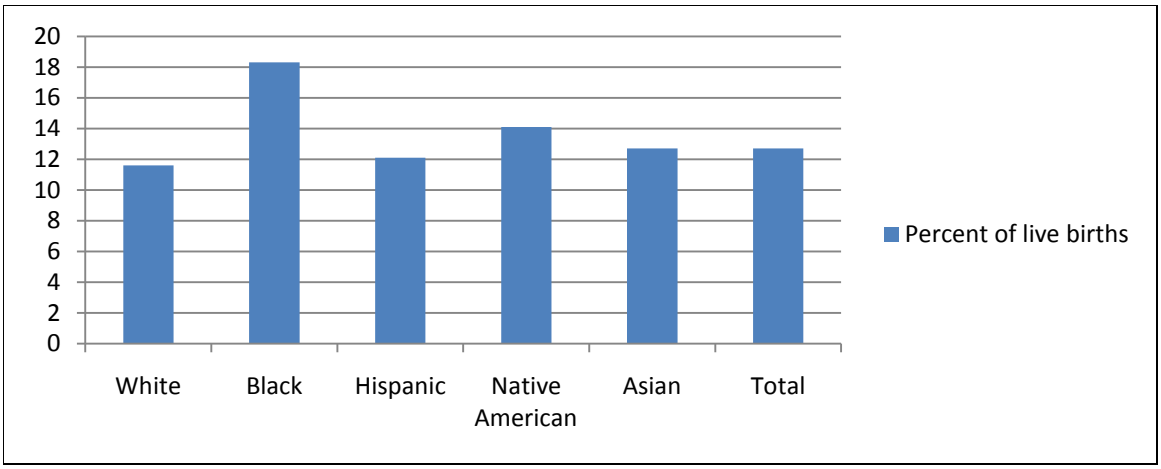

Figure 2.4 Percent of Preterm Births per 1,000 Live Births 2004- 2006

Socioeconomic status is another factor associated with preterm birth. Research findings show that there is not a direct linked between socioeconomic status and gestation. However, women of low socioeconomic status often participate in risky health behavior as mentioned above. It is this behavior that leads to shorter gestation (Kramer et al, 2001). Several studies have also linked the socially disadvantaged to preterm birth which is the leading cause of infant mortality in industrialized societies (Kramer et al, 2001). Several epidemiological studies have reported that prolonged strenuous activities at work are associated with increased risk for preterm birth which is work often done by minorities of low socioeconomic status (Chen, 2006; Bell et al, 2006; Collins, 2006). Examining preterm birth rates by region, preterm births have shown a recent rising trend from 2003-2006. The Southern Region has higher preterm birth rates across all years from 2003 to 2006 (Figure 2.5).

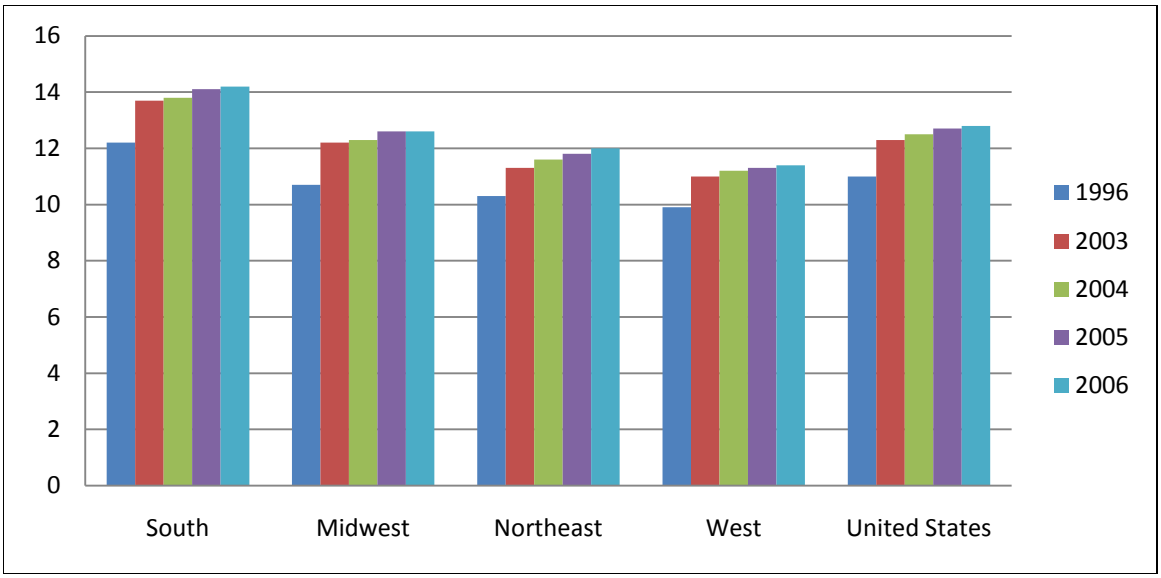

Figure 2.5 Preterm Birth Rates by Geographic Region, 2003- 2006

In Georgia, the preterm birth rates are higher than the national rate (Figure 2.6). There is an increase among preterm birth rates for all years for Fulton County. In 2007 there was a slight decrease in preterm birth rates for DeKalb County which lead to a decrease in the overall rate for the state of Georgia. However, the decline is not enough to return to 1996 levels.

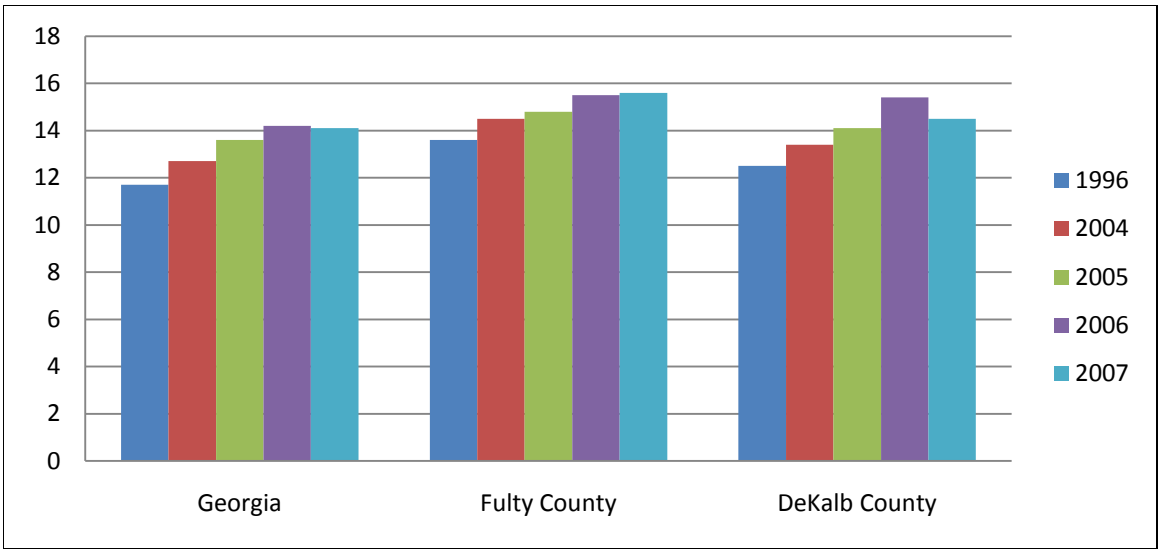

Figure 2.6 Percentages of Preterm Births by State and County 2004-2007

Low Birth Weight

Low birth weight is also an adverse birth outcome that is linked to infant mortality. Low birth weight infants are 40 times more likely to die during their first month of life (Thompson & Goodman, 2005). Low birth weight has been associated with long-term disabilities such as cerebral palsy, autism, mental retardation, vision and hearing impairments and other developmental disabilities (DHHS, 2000).

In the U.S., low birth weight rates have increased from 7.7% in 2001 to 7.8% in 2002; a 15% increase from rates in the middle of the 1980s (6.8%) (Martin et al., 2005; NCHS, 2003). Black women are almost twice as likely to have a low birth weight infant (Guyer et al, 1998). While low birth weight rates have decreased for white women (from 5.6%) and rates among black women have remained relatively unchanged (from 13.6%) since 1990, the low birth weight rate for black and white infants in 2002 were 13.4% and 6.9%, respectively (Martin et al., 2005). In 2004, there was an increase across races and has continued.

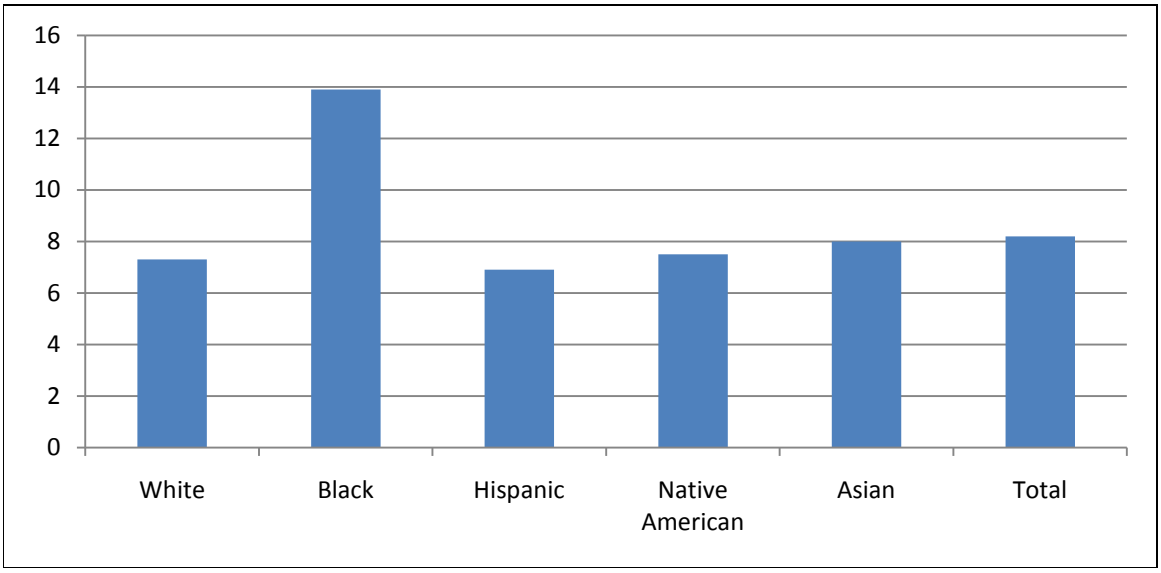

Figure 2.7 Percentage of Low Birthweight by Race, 2004- 2006

Significant differences in the incidence of adverse birth outcomes by race and socioeconomic status have long characterized infant health in the United States (Kleinman and Kessel 1987; Schoendorf et al. 1992). The correlation between low socioeconomic status and low birth weight is well recognized (Whitehead, 1997). Social class, maternal education, income, and marital status have been used as individual and household based socioeconomic status measures in the study of low birth weight (Spencer et al, 1999). These factors have an influence on access to care, being able to pay for care, and whether or not women seek early prenatal care (Almeisa, Dubay, Ko, 2001).

Although there are limited studies that examine the effects of geographic regions as a factor in low birth weight, it is a growing factor for birth outcomes. Like other health issues, where the South has been labeled the Stroke Belt, infant mortality rates, low birth weight and preterm births are more prevalent than in any other region. Figure 2.8 is an illustration of birth outcomes by region. The South has the highest rate of low birth weight across regions and nationally.

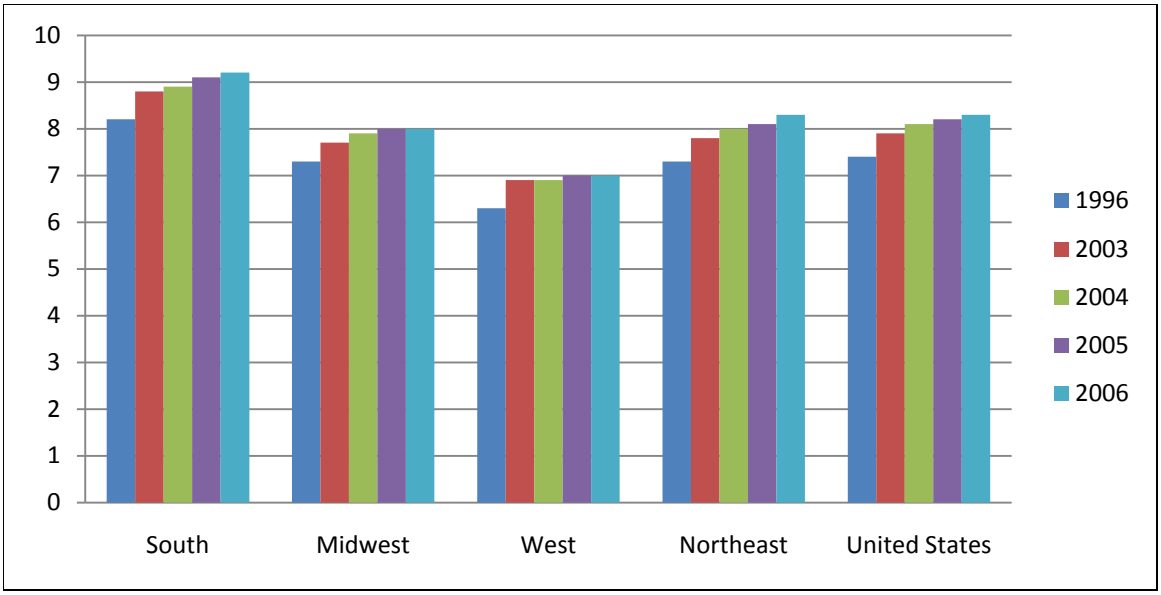

Figure 2.8 Comparisons of LBW Infants Across Regions

The regional differences in birth outcomes in the South are consistently higher than in other regions. These rates are particularly higher in the Deep South states (AL, GA, LA, and MS) (Goldhagen et al, 2005). Children born in the Deep South are 40% more likely to low birth weight than children in the other U.S. states. This has been linked to the lower SES in these states, teen births, maternal education, marital status, family income, checking or savings account, financial assets, and whether the mother grew up in a two-parent family (Nepomnyaschy, 2010).

Black women in the South are two times more likely than whites and Hispanics to have low birth weight children. Leslie et al (2003) found that infant mortality rates were lowest among Hispanic women. Low birth weight and prematurity rates were similar to those of white women and lower than those of African American women. Variables significantly related to healthy composite birth outcomes among Hispanic women included higher education, no preterm delivery history, prenatal care, marriage, and no daily tobacco use. Hispanic birth outcomes in North Carolina were better than those of African American women and similar to those of white women, despite use of prenatal care and socioeconomic characteristics similar to African American women.

In Georgia, as well as in DeKalb and Fulton Counties, the low birthweight rate continues to fluctuate. In 2008, the low birth weight rate in Dekalb County was 13% for black women, which is twice the rate for the entire county for all races. In Fulton County (2008), the low birth weight rate was 14.6% for black women, which was also, double the county rate. Both counties received very low grades in the Health Disparities Report for the state of Georgia. Figure 2.9 is an illustration of the low birth weight rates for Georgia, DeKalb County and Fulton County from 2004-2007.

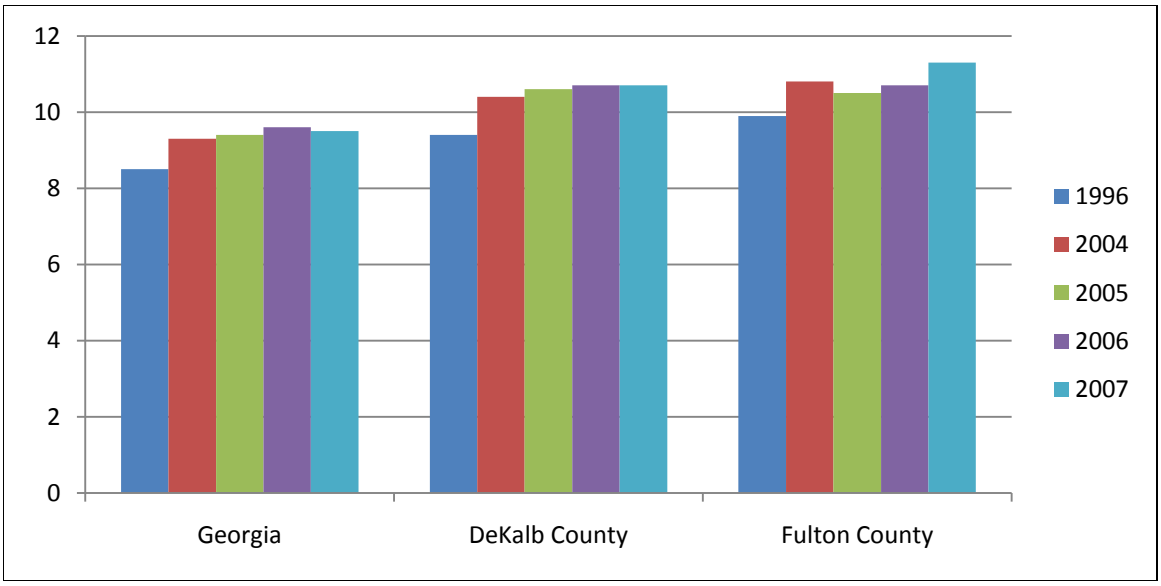

Figure 2.9 Percentage Low Birthweight Rate Births (<2,500 Grams) by State and County 2004-2007

Infant mortality, preterm birth, and low birth weight are all increasing birth outcomes that are consistently found across the United States. However, these birth outcomes are more persistent among black women and in the Southern Region, including Fulton and DeKalb Counties in Georgia. With adverse birth outcomes among black women being double and almost triple that of other races, the importance of early prenatal care is essential to improving birth outcomes among this racial group. This study can provide possible explanations for why black women of all social classes are at risks for adverse birth outcomes particularly in the South.

Factors associated with Preterm Birth and Low Birth Weight

There is a large body of public health research designed to explain preterm births and low birth weight. Early research focused on biological explanations only (Buekins & Klebanoff, 2001; Leitich & Kaider, 2003; Carey & Klebanoff, 2000; Guise et al, 2010). Many studies have focused on biological factors such as vaginal infections. However, empirical findings from

clinical trials have shown that women that have been treated for these infections did not reduce preterm birth and in some cases when treated actually increase the rates of preterm birth (Buekins & Klebanoff, 2001; Leitich et al, 2003; Carey & Klebanoff, 2000; Guise et al, 2010). More recent research finds that preterm births and low birth weight complexly inter-relates biological, psychological, and social factors that all are a part of a common pathway to preterm birth and ultimately infant mortality. Unfortunately, these studies do little to enlighten us as to the mechanisms through which preterm birth and low birth weight actually happens. Despite this, prenatal care has been shown to successfully intervene and reduce instances of preterm birth and low birth weight (IOM, 2005; Schulz & Mullings, 2006).

Although prenatal care has been shown to be effective in reducing birth outcomes, the lack of use of these services by minority women who could benefit the most from these services remains a mystery. Public health researchers have studied biological issues, behavior and beliefs, but have done little research to explain the social factors that are preexisting and constant to provide a complete explanation as to why black women utilize prenatal care services less than their white counterparts.

Studies have consistently established that women receiving prenatal care in the first trimester (≤13 weeks) have better pregnancy outcomes, including a reduced risk of low birth weight and preterm births, than do women who receive late or no prenatal care. Early prenatal care has also been recommended to decrease the racial and ethnic disparities in adverse birth outcomes (Cohall & Bannister, 2001).

Prenatal Care

Prenatal care is a set of services provided to improve pregnancy outcomes and engage expectant mother, family members, and friends in health care decisions. Through the early and

continued use of prenatal care, women receive an array of medical, educational, and nutritional interventions throughout the duration of the pregnancy (Alexander & Kotelchuck, 2001; Alexander & Korenbrot, 1995). Health professionals and policy makers generally agree that early prenatal care intervention is an important contributor to infant health (Exworthy et al., 2006; Rosman & Yoshikawa, 2001), and used to monitor maternal and fetal health, and finally to identify women at risk for adverse birth outcome (Alexander & Cornely, 1987; Lang & Iams, 2009).

In the United States, 74.7% of live births were to women receiving adequate care /adequate care plus prenatal care. However, 25.3% of women received late or inadequate prenatal care. This averages out to about 1 in 9 infants (11.3% of live births) born to women receiving inadequate prenatal care in the United States while 1 in 28 (3.6%) women received late or no prenatal care (March of Dimes, 2009).

In the United States the utilization of early (during first trimester) prenatal care has fluctuated from 68% among all racial groups in 1970 to an increase in 2004 to 84.2% then to 83.9% in 2005. In 1970, women in all racial groups receiving late (3rd trimester) or no prenatal care were 32% in 1970. In 2005, that rate had decreased to 16.1% among all racial groups (Figure 2.10).

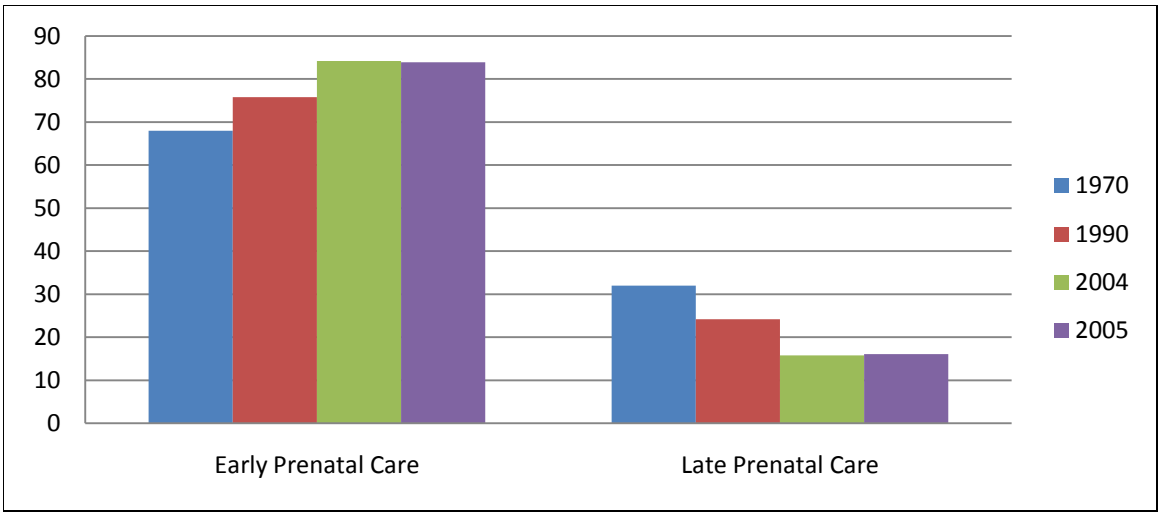

Figure 2.10 Early and Late Use of Prenatal care In the United States for All Races (1970-2005)

However these rates differ among minority groups. For black women, though the use of early prenatal care has increased from 44.2% in 1970 to 76.3% in 2005. This leaves a total of 23.7% of black women who receive late (after 1st trimester) or no prenatal care in the U.S, each year. For black women, the rates for receiving late or no prenatal care has decreased from 1970 to 2005 (Figure 2.11) but the rates are still higher than any other racial group. However, the rate for black women receiving late prenatal are almost triple that of their white counterpart.

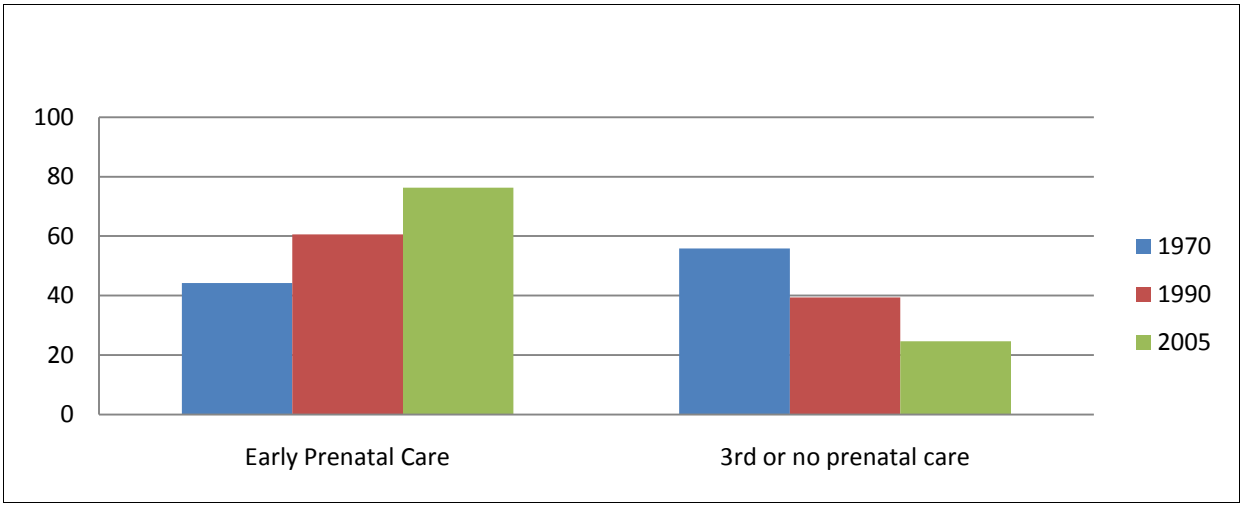

Figure 2.11 Early and Late Utilization of Prenatal Care for Black Women (1970- 2005)

The utilization of prenatal care also varies across region. However due to all states not converting to the new birth certificate format in 2002, prenatal care rates by region is not available after 2002. This is also due to the fact that regions are loosely defined when it comes to maternal and child health data.

Late or no prenatal in Georgia varies by county. The 2008 Health Disparities for Georgia (described earlier) reported the rates by county for 2008. The rates for black women are significantly higher than the rest of the county for inadequate (late or no) prenatal care. In Dekalb County, the percentage of black women who received inadequate care was 23.9%, while in Fulton the percentage was 20.9%.

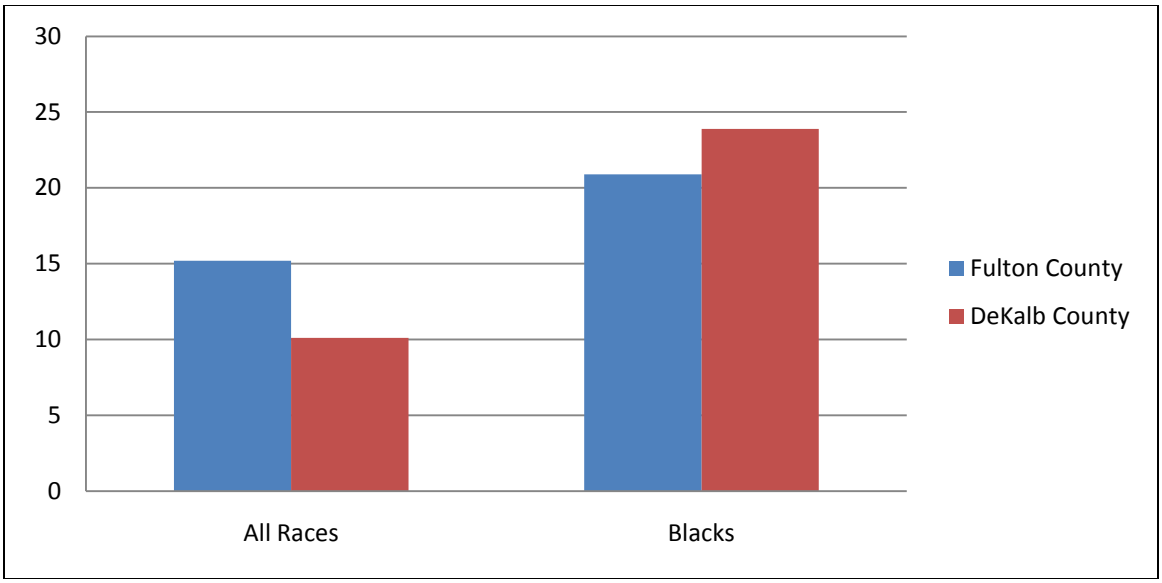

Figure 2.12 Percentage of Late or No Prenatal Care by Racial groups for DeKalb and Fulton Counties, 2006

Despite repeated recommendations for early use of prenatal care, many women, especially black women, continue to seek or receive inadequate or no prenatal care. Several studies have indicated that the socially disadvantaged (e.g., women of low socioeconomic status, or minority status) derive the greatest benefits from prenatal care services (Coreil, 2009; Lucus,

2008). Among the socially disadvantaged, black women benefit most from prenatal care services (Daniels et al, 2006; McGlade &Saha, 2004; Almond et al, 2005).

The above literature review demonstrates that black women have higher rates of adverse birth outcomes compared to white women, especially in the South. Black women also (in the south) show the lowest rates of prenatal care compliance compared to white women. Southern Black women of low socioeconomic status have different life experiences, psychosocial stresses, and coping strategies that may explain their differing use of prenatal care (Dole et al, 2004, Hogue et al, 2001; Lu & Halfon, 2003). By focusing exclusively on this group and their uses of prenatal care, this study may contribute greatly to our ability to intervene with low access groups more broadly, to increase the use of early prenatal care use, and to reduce adverse birth outcomes. Sociology, with its focus on structural explanations, provides the best framework for explaining prenatal care usage and compliance by this group.

Theoretical Framework

Although there are many explanations for late or no prenatal care use and compliance by black women of low socioeconomic status, no one theory explains it all. The literature to date has shown there are inequalities in birth outcomes in prenatal care usage by race, class, and region of country, therefore I will use the intersectionality framework (based on Intersectionality Theory) as the theoretical foundation for this study. Also, I will use Health Belief Model which is an offshoot of Rational Choice Theory to explain prenatal care usage and birth outcomes for this group intersected by race, class and region.

Intersectionality Theory

Intersectionality is a term coined by legal scholar Kimberle´ Crenshaw (1989) to understand the multiple dimensions of marginalized groups and their lived experiences. It is the interaction between social constructs that offer a combined explanation for social issues in society.

Theories in intersectionality are centered around inequality and the hierarchical structures that are based on power relations. Intersectionality has emerged as the primary theoretical tool designed to combat feminist hierarchy, hegemony (processes in which a dominant class exercises their cultural leadership), and exclusivity (Anderson & Collins, 2004). Intersectionality Theory is not limited to gender inequality and is also used to examine power inequalities between social classes and race.

Race, Class, and Gender

Race- Race is one of the principal mechanisms through which societies self organize (i.e. skin color), by creating dominate and subordinate subgroups. All societies create a status hierarchy in which some groups are given privilege and power over other groups that are marginalized and stigmatized (Delany, 2005). The social construction of race varies across countries based on the differences in societal organization and the majority groups that are in power. There is a dominant group that emerges and subordinate group(s) that fall in line beneath the dominant group. This dominant group has all the advantages and resources that are offered by society. They have power and elitism (Feagin & Feagin, 2003). The subordinate group is viewed as different because of their physical and cultural characteristics. The subordinate group is view as an outsider and is subjected to unequal treatment and limited

resources (Feagin & Feagin, 2003). It is the separation and classification into different racial or cultural groups that ultimately lead to inequality.

Social Class- Similar to race, a class system is a social stratification based on the ownership and control of resources and on the type of work that people do (Kendall, 2005). Social class is a multidimensional economic construct that hierarchically groups people by income, education, wealth and occupation. The stratification of social class is based on hierarchical framework in which the individuals with more money, property, etc have the most power. This power is associated with social mobility which uses occupational information as it backbone, and also includes educational attainment when assessing an individual's social mobility. One's social origins and "destinations" is based on social class. The higher a person is on the hierarchical chart, the more likely they will possess power and have social mobility.

Gender- Gender is a primary mechanism in which societies create hierarchical structures, with men at the top of the hierarchy and women at the bottom of the hierarchy. On the surface, society views the differences between men and women as just a matter of sex and/or gender. In the past, it was commonly thought that sex determined gender and the differences between men and women were rooted in their biological origins. While the term sex refers to the physical and anatomical characteristics used to distinguish male and female bodies, gender is defined as the socially constructed roles, behaviors, activities, and attributes that a given society designates as appropriate for each sex. This extends to the differences in the way men and women in a particular society are expected to feel, think, and behave (Wharton 2005). Therefore women's roles, behaviors and thoughts are different from men and come from their subordinate position.

Intersection of Race, Class and Gender on Access to Healthcare

The combination of race, class, and gender has had a devastating effect on the health of minority groups. These effects are mostly seen in the black community and especially among black women. Black women, who are among the double minority group (being both black and a woman), fall at the bottom of the social hierarchy experiencing oppression in many different forms and levels of intensity which lead to adverse health outcomes and health disparities. In addition, the intersection of race, class, and gender has been linked to limited or no access to healthcare based on structural issues such as clinic location and hours of service and to poor health and health outcomes that lead to an overall poor quality of life among this group. These poor outcomes are seen in maternal and child health issues, chronic diseases such as diabetes, cardiovascular disease, HIV/AIDS, mental health, and other health issues. The explanation for these poor health outcomes can be linked to lack of access and to the variation in power among racial groups which is the core of intersectionality theory (Weber, 2006).

Patricia Hill Collins explores the oppression of black women in the United States based on race, class, and gender imposed by the dominant society's ideologies. Collins argues that combined race, class, and gender form a matrix of domination. Collins adds to this theory by addressing the feminist perspective from a black woman's point of view. Collins argues that it is the interlocking systems of oppression (race, class and gender) created by the white male dominant society that has inhibited the success and empowerment of black women.

The class position in the black community is mostly shaped by their positions in the economy. Blacks have limited economic opportunities based on institutional racism and discrimination that have limited their position in their class structure (Anderson, 2000; Martinot,

2000). *Black Bourgeoisie* (Frazier, 1957), identified the role of white racism in shaping the class structure and inter-class dynamics of the black community.

The power dynamic for black women is generated by the intersection of race, class, and gender and can easily be applied to the healthcare system. This intersection offers an explanation as to why women who are poor and among the underclass group have limited or no access to healthcare services, have limited health literacy, and are less likely to adhere to regimens prescribed or recommended by their healthcare provider. The concepts of power and class are both reasons for the observed health differences between blacks and whites in the U.S. Mutchler and Burr's (1991) work on racial differences in health and healthcare serves to make a compelling argument that traces the differences in both groups for morbidity and mortality to differences in socioeconomic status. Socioeconomic status conditions have an effect on health outcomes because those with lower socioeconomic status have less ability to pay for services, lack access to care, lack proper food for nutrition, and have limited knowledge of health care. Socioeconomic determinants of health show conclusively that individuals with more education and income are in better health (Victor, 1989). This study demonstrates that it is not enough to have healthcare available but other factors such as transportation, social support, education, and access to information to service locations, and financial issues all play a role in health outcomes.

Because of the limited power, and lack of knowledge, accessing healthcare can be a daunting task for black women. Black women are faced with many other social issues, such as working, caring for their families (immediate and extended), childcare, etc. It is crucial for healthcare providers to understand the intersection of race, class, and gender to understand how to communicate, interact, diagnosis, treat, and follow-up with black women. In *An Analysis of Cultural Differences in Healthcare Education,* Coello et al. (2004) used Critical Race Theory to

examine cultural competency in healthcare. Because of race, class, gender, and ethnicity barriers, healthcare providers do not know the social conditions of the black community outside of the clinic setting. The racialized structure in the black community is normally the "white" provider and the black patient. For the providers to provide fair, equal, and impartial healthcare, they must understand the patient's culture, family and community norms. The provider must have a larger sense of the patient's story to improve the quality of communication and care thereby improving the quality of healthcare for both the patient and the provider. Traditionally, doctors have treated patients as if all their social conditions are the same. By failing to acknowledge the differences among patients, the quality of care for minority patients will continue to decline.

In this dissertation, I argue that although the disparities in the utilization of early prenatal care are important, there are some preexisting social constructs that intersect in the lives of black women that play a substantial role in their health beliefs, behavior, choice and ultimately health outcomes. These social constructs are race, class and gender. The intersection of these three social constructs is not additive but interlocking. That is, they all interact together simultaneously and mutually to generate multiple oppressions (Andersen and Collins, 1995, 2009; Brodkin 2000:240; Brewer 1993:13). Race, class, and gender all intersect in and collide with other barriers such as geographic location, access to care, knowledge of healthcare, social support and stressors that lead to limited or no prenatal care use and adverse birth outcomes. Therefore, it is important to limit the analysis of prenatal care to low-income, black women in order to understand the factors associated with why some overcome structural barriers and utilize and comply with early prenatal care and others do not.

Health Belief Model

The Health Belief Model is a form of Rational Choice Theory that is less well known to sociologists. Rational Choice Theory is an approach used by social scientists to understand human behavior. The approach has long been the dominant structural/functionalist paradigm in economics, but also in sociology, political science, and anthropology. The basic principles of Rational Choice Theory are derived from neoclassical economics and utilitarianism (Cook & Levi, 1990; Lindenberg, 2001). This spread of the rational choice approach beyond conventional economic issues is discussed by Becker (1976), Radnitzky and Bernholz (1987), Hogarth and Reder (1987), Swedberg (1990), and Green and Shapiro (1996).

Rational Choice Theory is a theory that has been met in the sociology field with apprehension because it begins with the actions of the individual not society and that it contradicts the teachings of Marxian and Weberian approach of macro social forces and focuses on the individual. Individuals are focused on specific goals or outcomes that they want to achieve based on their preferences without regard for the societal constraints or barriers that are inequitably imposed.

Another argument that causes some pause to the use of Rational Choice Theory is that there is a large body of literature that speaks to how individuals are impulsive, emotional, or habit forming when they make choices (Scott, 2000). Choices such as seeking healthcare, children, jobs, etc can be emotionally taxing but rational choice theorist view these choices as based on resources that are available and not emotions. Some social scientists believe that because decisions are made based on numerous factors, that rational choice theory is implausible. In the public health arena, professionals/researchers use a form of this theory to

explain both the individual (agency) and structural barriers. This theory is the Health Belief Model.

The structural institutions of society are guided by policies put into place by privileged groups. These policies set up structural barriers and constraints that inhibit or limit access to resources, such as healthcare, to less privileged groups. These policies include high premiums for healthcare services and health insurance and location of health centers. A way to address these structural barriers is thorough the use of the Health Belief Model.

The Health Belief Model goes beyond one's preferences and behaviors to examine the constraints and barriers that are based on performance and utility of healthcare associated with lack of resources, barriers and other structural constraints. HBM was initially developed in the 1950s by social psychologists in the U.S. Public Health Service. This model was used to explain the widespread failure of people to participate in programs to prevent and detect disease (Hochbaum, 1958; Rosenstock, 1960 & 1974). Overtime, the model was extended to study people's responses to diagnosis of disease, their response to symptoms, and a patient's ability to adhere to their prescribed medication regimen (Rosenstock & Kirscht, 1974; Becker, 1974). These researchers assumed that people feared diseases and that the health actions of people were motivated by the degree of fear (perceived threat) and the expected fear reduction of actions, as long as that possible reduction outweighed practical and psychological barriers to taking action (net benefits). HBM was one of the first models which adapted theories from the behavioral sciences to examine health problems. It is still one of the most widely recognized and used models in health behavior applications.

There are several primary concepts with in HBM that predict why people will take action to prevent, screen for, control illnesses. These concepts are: 1) **perceived susceptibility**, a

person's opinion of the chances of getting a certain condition; 2) **perceived severity**, a person's opinion of how serious this condition is and the likelihood of contracting the disease; 3) **perceived benefits**, a person's opinion of the effectiveness of some advised action to reduce the risk or seriousness of the impact; and 4) **perceived barriers**, a person's opinion of the concrete and psychological costs of this advised action.

The first component of HBM, perceived susceptibility is a person's opinion of the chances of getting a certain condition. For example, a pregnant woman may ask the question how susceptible is she to deliver a preterm or low birth weight baby? According to the literature, minority women of low SES do not perceive themselves as being susceptible to delivering a baby with health issues so they do not see the need for early or in some cases, late or no prenatal care (Pagnini, Reichman, 2000, Williams, 2008). Janz and Becker (1984) posit that perceived susceptibility in one of the most powerful points to intervene to improve birth outcomes.

The second concept is perceived severity and seriousness. Perceived severity is the degree to which and individual views the condition as being serious (Rosenstock, 1974, 1990). Researchers have conducted qualitative research studies surrounding barriers to prenatal care among minority women of low SES. Several of these studies have examined the health beliefs of the study participants. Some of the pregnant women viewed the delivery of low birth weight baby as a serious problem in terms of the baby’s health but not in terms of their own health (Daniels et al, 2006; Alexander, 2002). Like perceived susceptibility, perceived severity is a cognitive component that can be influenced by knowledge (Stout 1997 & 2002).

The third component of HBM, perceived benefits is the degree to which an individual believes that if they do a certain action that it will be both beneficial and effective in preventing a health condition (Rosenstock, 1990). Unlike perceived susceptibility and severity that both

provide the individual to a specific action, perceived benefits aid in guiding the force that leads to action based on the beliefs about the outcome of that action (Rosenstock, 1974 & 1990). For example, studies have shown that although women recognize that there are many different options available to help prevent babies born with low birth weight, they will choose the option that they perceives will benefit their baby the most (Williams, 2008).

The fourth component of HBM, perceived barriers is when the negative aspects of an action serve as barriers that lead to avoidance. Several barriers identified in the literature as to why black women obtain late or no prenatal care are financial, lack of knowledge, lack of social support, just to name a few. When confronted with a barrier, the individual does a barrier-benefit analysis (weighing the pros against the cons) to form a decision. For women with low SES and other barriers, the barriers outweigh the benefits and their actions and beliefs lead to adverse birth outcomes. Janz and Becker (1984) believed that perceived barriers are the second most important place to intervene to improve birth outcomes.

Table 2.1 Key Concepts and Definitions of the Health Belief Model

Concept	Definition	Application
Perceived Susceptibility	Belief about the chances of experiencing a risk or getting a condition or disease	Define populations at risk, risk level Personalized risk based on a person's characteristics or behavior Make a perceived susceptibility more consistent with individual's actual risk
Perceived Severity	Belief about how serious a condition and its sequelae are	Specify consequences of risks and conditions
Perceived Benefits	Belief in efficacy of the advised action to reduce risk of seriousness of impact	Define action to take how, where, when; clarify the positive effects to be expected
Perceived Barriers	Belief about the tangible and psychological costs of the advised action	Identify and reduce perceived barriers through reassurance, correction of misinformation, incentives, assistance

Table 2.1. Health Belief Model Components and Linkages Glanz, K, Rimer, B.K., Viswanath, K. *Health Behavior and Health Education: Theory, Research, and Practice* (4th ed.) p.49

Even though the Health Belief Model was originally developed to help explain certain health related behaviors, it has also helped to guide the search for "why" these behaviors occur and to identify points for possible change. Using this framework, change strategies can be designed as referred to earlier. The Health Belief Model has been used to help in developing messages that are likely to persuade an individual to make a healthy decision. These messages that are suitable to health education for such topics as hypertension, eating disorders, contraceptive use, or breast self-examination have been developed.

Conceptual Model

Figure 2.13 represents the final model for these adverse birth outcomes (additional models that are combined to develop the final model is included in the Appendix (A1-A4). The model goes from most distal, financial strain, family size, social support to most proximate

causes which includes risky health behaviors, timing of prenatal care utilization and compliance. Low socioeconomic status pregnant women experience more stressful life events during their pregnancy. Chronic stressors are embedded within and accrue from the environment of low SES women (Kramer et al, 2001; Tamis-LeMonda, 2002; Holland et al, 2009). These stressors include financial insecurities, poor and crowed housing conditions, living without a husband/partner, unsatisfying marital relationships, domestic violence, and stressful conditions (Tamis-LeMonda, 2002; Holland et al, 2009). Living in a chronically stressful environment erodes personal resilience which may increase stress, anxiety, a sense of helplessness, a lack of optimism, and depression that has been linked to increased risk of poor birth outcomes.

Knowledge and Attitude

Lack of knowledge and a woman's attitude about prenatal care is well cited in the public health literature (Braverman et al, 2000; Hogue et al, 2001; Rowley et al, 2004). Lack of knowledge includes factors such as being unaware of the signs and symptoms of pregnancy, not knowing when or how to seek prenatal care, or the importance of prenatal care. Previous research has shown that women who are knowledgeable about prenatal care and adverse birth outcomes often times seek early prenatal care while women who are less knowledgeable seek late or no prenatal care (Daniels et al, 2006; Braverman et al, 2000; Chandler, 2002). A caveat to this explanation is that multiparious women often have more knowledge about pregnancy, prenatal care importance, and compliance. Oftentimes they believe they know what to do about their pregnancy and often seek late or no prenatal care.

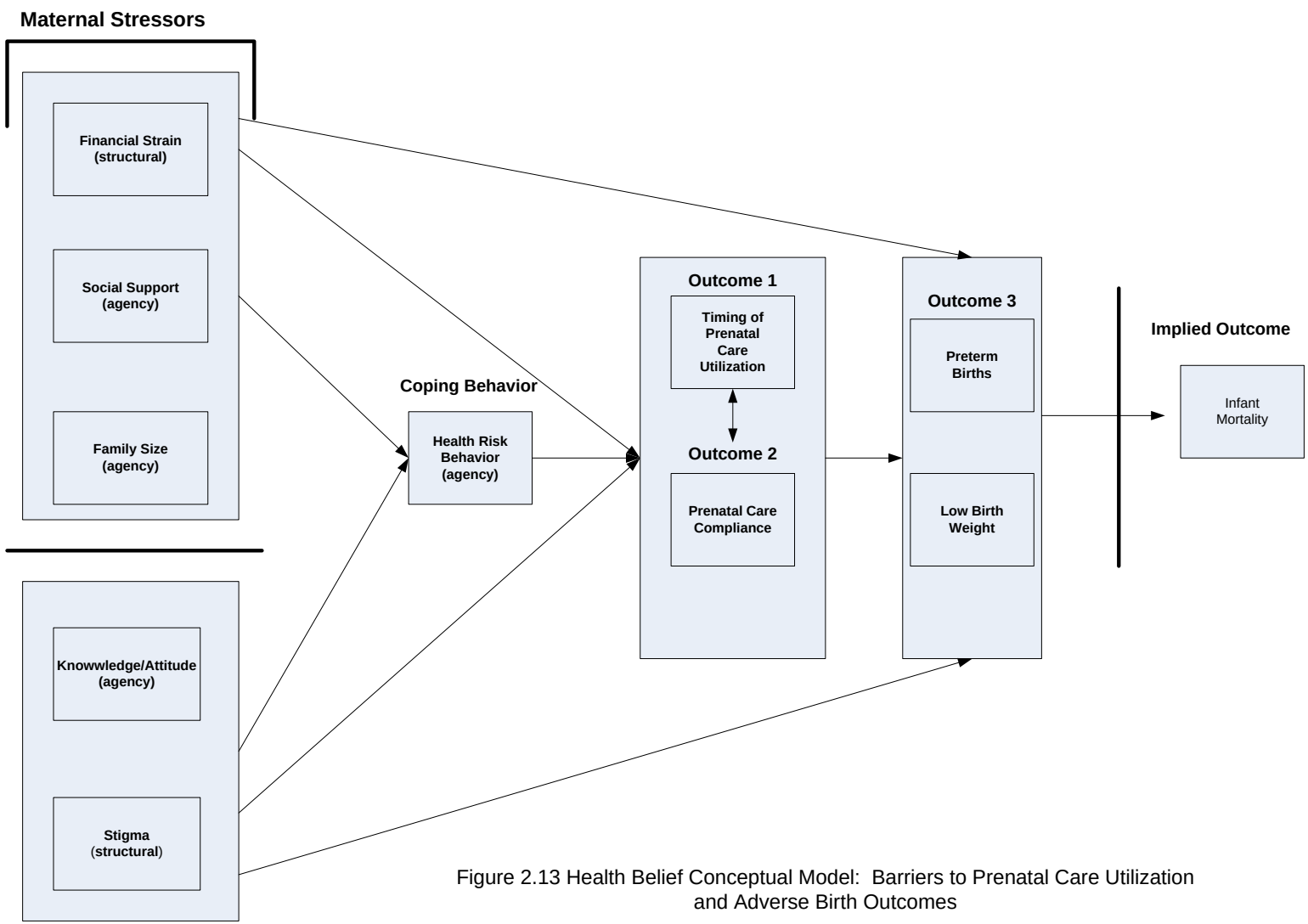

Figure 2.13 Health Belief Conceptual Model: Barriers to Prenatal Care Utilization and Adverse Birth Outcomes

The order in this model is random- there are no assumptions made by about structure or agency

Knowledge has been shown to have a direct effect on attitude about prenatal care and other health issues. The attitude has also been viewed as a barrier to prenatal care as well. This attitude can be based on a number of things such as stigma (which will be discussed later), race/ethnicity, culture, and historical events. Women who have positive attitudes about pregnancy and prenatal care tend to seek early prenatal care while women who have negative attitudes seek late or no prenatal care (Gazmararian et al, 1999; Braveman et al, 2000; Learman et al, 2005).

Financial Strain

One of the overarching stressors associated with poor birth outcomes is financial strain. Economic stress is stress that is brought about through lack of income and resources within a given area. These stressors can be brought on by limited resources within a given neighborhood, lack of job opportunities for minorities, lack of transportation to jobs in other communities, etc. Research findings show that there is not a direct linked between socioeconomic status and gestation. However, women of low socioeconomic status often participate in risky behavior to accommodate for the lack of or need for money. It is this behavior that leads to shorter gestation and low birth weight (Kramer et al, 2001).

Due to the lack of financial stability, minority women of low SES will take laborious jobs to either as their primary job or as a part-time job (in addition to a full-time job). More recent studies have focused on a number of stressors (as mentioned previously), however the stressor of hard work has not been included in most models. Hogue et al. (2001) and others argue that the physical stress associated with blue collar work has been associated stress-related preterm

delivery, low birth weight and infant mortality (Mozurkewich et al, 2000; Saurel-Cubizolles et al, 2004; Goldenberg et al, 2008).

Another factor effecting birth outcomes is neighborhood income. The maternal socioeconomic status is an important determinant of inequality in maternal and fetal health (Luo et al., 2006; Luo et al, 2004; Lynch et al, 2001; Krieger et al, 2003). Although socioeconomic disparities have been linked to adverse birth outcomes, population-based studies on their association have been limited and hampered by the paucity of data on socioeconomic status in most perinatal surveillance databases (Kreiger et al., 1997). For example, the U.S. birth registrations only contain information on maternal education but not income and if the information is available in some instances, the information is not well documented (Kreiger et al, 1997; Dubay et al, 2001).

Luo et al. (2006) examined the effects of neighborhood income and maternal education on birth outcomes. This study, like others show a link between birth outcomes and maternal education and income. Mothers who are living in poorer neighborhoods were likely to be unmarried, younger than 20 years of age, and have not graduated from high school. It was in these neighborhoods that they found increasingly higher rates in preterm births, small for gestational age, stillbirth, low birth weight, and infant mortality. They also found that the risk gradient for adverse birth outcomes were larger across the maternal education strata. These results are consistent with other studies who also found that socioeconomic status has an effect on birth outcomes (Pickett et al, 2002; Pearl et al, 2001).

Socioeconomic factors can also a have profound effects on the health of individuals and populations, and the perinatal domain are particularly susceptible to such influences. The principal pathways by which socioeconomic status affects perinatal health include those that

operate through lifestyle and behavioral factors: a large fraction of socioeconomic differences in adverse perinatal outcomes can be explained on the basis of factors such as maternal age, smoking, marital status, alcohol consumption, obesity, residence (rural v. urban), education, weight gain, early prenatal care, prenatal class attendance, parity and breast-feeding (Jacobsson et el, 2004). Many studies have shown that family income and other socioeconomic factors are strongly associated with late or no prenatal care that is linked to some adverse perinatal outcomes, including gestational diabetes, small-for-gestational-age live births and infant death (Collins & David, 1992; Rosenberg et al, 2007; Bennett et al, 2006; Braverman et al, 2005; Chen et al, 2007; Healy et al, 2006). These findings highlight potential gaps in health information and in social support for socioeconomically vulnerable mothers and families during pregnancy and after birth.

Stigma

Stigma is something that detracts from the character or reputation of a person, group, etc. that is marked by disgrace or reproach indicating that something is not considered normal or standard (Goffman, 2000; Susman, 1994, Wilson & Luker, 2006; Parsons, 1951). The stigma from the attitudes of doctors and nurses play a huge role in whether a woman seeks early prenatal care and continues their appointments after their interaction with the doctors. The attitudes of the doctors and nurses have an effect on an individual's health beliefs and their desire to change their behavior to seek early prenatal care.

Social Support

Social support is broadly defined as resources provided by others (Cohen & Syme, 1985; Cohen, 1985) and also as the emotional, instrumental, or financial assistance that is obtained from one's social relationships (Berkman, 1985). There is a growing body of literature demonstrates that social support and social relationships have a positive impact on physical health and psychological well-being (Sarason et al, 1997; Will and Filer, 2001). Social relationships are thought to be supportive to the extent that they provide individuals with access to resources during times of life stress and transition as well as a general sense of self-worth, psychological well-being, and control over their environment (Cobb, 1976; Thoits, 1995).

During pregnancy, social support is considered essential to the health and well-being of the expectant mother (Oakley, 1988). The provision of emotional, informational, and material resources may mitigate the physical and psychological strains associated with pregnancy (Lederman, 1984; Dunkel-Schetter et al, 1996). Support may also motivate the mother to engage in positive health behaviors and to make lifestyle changes that can improve her physical health (Dunkel-Schetter et al, 1996). Thus, there are multiple pathways through which social support may be linked to improve maternal and child health and consequently better birth outcomes.

Although some researchers may argue that social support has limited effects as a direct link to adverse birth outcomes, they do admit that there is some benefit to women having strong social bonds during pregnancy. These benefits may be financial, educational, reduction in risk behavior during pregnancy such as smoking and drinking, and transportation to and from prenatal care visits that could ultimately improve birth outcomes of at risk populations. For black women, social support is a major component in improving birth outcomes. This social support may come in the form of churches, group prenatal care, friends, and most importantly family.

Family Structure and Size

As mentioned previously, family is an important part of social support and a major piece in the puzzle in researcher's attempts to explain the dangerously high rates of adverse birth outcomes among black women. In the black community, black women are the caregivers, nurturers, and matriarchs of the family in often single parent homes. They have to make choices that do not always put them first. These choices can be seen in limited or no prenatal care seeking behavior. There are certain costs when seeking health care. The cost may be financial but it may also be time taken away from other responsibilities. The rational choices that black women make can be linked to opportunity costs.

This opportunity cost can be linked to the lack of fathers as social support for black women during and after pregnancy. A study conducted by Sandra Lane (2003) on missing fathers found that the lack of social support due to death (increased number of black men dying due to violence) and incarceration has an increased the level of maternal stress thereby affecting birth outcomes. For example, female led households in the United States (2000) for blacks were 47% in comparison to the white counterparts (16.7%). The black-white comparison is almost triple the rate for black women. This study also examined birth outcomes for households with fathers present and without. The study found that black women with fathers present (70.8%) utilized prenatal care in the first trimester. Without fathers present, the use of prenatal care in the first trimester was (48.6%). This is a difference of 22.2%. In examining birth outcomes (low birth weight, very low birth weight, neonatal death, post natal death, and infant death), all positive birth outcomes were more prevalent in households with father present.

Risky Health Behavior

All the stressors discussed above (financial strain, limited or no social support, and non-traditional family structures and size) can lead to risky health behavior. These risk health behaviors act as a coping mechanism for dealing with daily stressful events. This risky behavior for pregnant women can lead to adverse birth outcomes. These risky behaviors include smoking cigarettes, marijuana, and other illegal drugs, drinking, not seeking medical treatment, participating in high risk jobs or extracurricular activities that can all effect the development of the fetus and also put the mother's health at risk.

Table 2.2 is a list of risky behavior identified in the literature that has been associated with preterm birth. Studies have shown an increase in these behaviors among black women during pregnancy (Reagen & Salsberry, 2005; Glynn et al, 2008; Hobel et al, 2008). These studies found that social issues such as dilapidated housing, impoverished neighborhoods, poverty, preexisting chronic diseases, lack of social support, etc. all lead to elevated stress levels that have adverse effects on birth outcomes. These studies all focused on racial and ethnic differences and found that these elevated conditions were more prevalent among black woman which have elevated levels of preterm birth. This adds credence to how race plays a role in birth outcomes.

Table 2.2 Risky Behavior Associated with Preterm Birth

Risky Behavior Associated with Preterm Birth	
No or inadequate prenatal care usage	Cigarette smoking
Use of marijuana and other illicit drugs	Cocaine use
Alcohol consumption	Caffeine intake
Maternal weight gain	Dietary intake
Sexual activity during late pregnancy	Leisure-time physical activity

Although there are many explanations to explain certain parts of late or no prenatal care by black women of low socioeconomic status, no one theory explains it all. For this dissertation,

I posit that there is a need to examine within group agency and structural factors to explain the barriers to black woman's seeking early prenatal care and adhering to its guidelines once started.

This dissertation will focus on the following research questions and hypotheses for prenatal care utilization, prenatal care compliance, preterm births, and low birth weight: Controlling for the theoretical framework of the intersection of race, class, and gender, I hypothesize:

1. **Research Question: Is there a relationship between agency factors and timing of prenatal care utilization?**

The hypotheses for examining the effects of agency factors (social support, family size, and knowledge/attitudes) are listed below.

H1: Women with a large family size will seek late prenatal care in comparison to women with smaller family units.

H2: Women who are more knowledgeable about pregnancy and prenatal care are more likely to seek early prenatal care than women with limited or no knowledge about pregnancy and prenatal care.

H3: Black women with social support will more likely seek early prenatal care than women with limited or no social support.

2. **Research Question: Is there a positive relationship between structural factors and timing of prenatal care utilization?**

H4: Women who are effected by financial strain are less likely to seek early prenatal care.

H5: Women who experience stigma by their healthcare providers are less likely to see early prenatal care.

H6. Women who have private insurance are more likely to seek early prenatal care.

3. **Research Question: Is there a relationship between risk health behavior and birth outcomes (preterm births and low birth weight)?**

H7: Risk health behavior has a negative effect on early prenatal care utilization.

4. **Research Question: Is there a relationship between timing of prenatal care utilization/compliance and birth outcomes (preterm births and low birth weight)?**

H8: Women who are late in receiving prenatal care are more likely to have preterm births.

H9: Women who are not prenatal care compliant are more likely to deliver preterm births.

The causes of infant mortality, preterm births, stillborn births, and other health issues surrounding negative birth outcomes in minority populations have been linked to many factors previously discussed. These factors have been linked to social constructs such as race and provide a compelling argument for further study of why black women of low SES living in poor neighborhoods have alarming rates of preterm birth, low birthweight, and infant mortality. Public health researchers argue that the main reason for these adverse birth outcomes is lack of prenatal care. This dissertation will argue that there are social factors that are pre-existing that affect health beliefs and choices that lead to late prenatal care utilization.

CHAPTER 3:

DATA AND METHODOLOGY

In the previous chapters, I have set the stage for examining timeliness of obtaining prenatal care and the importance of prenatal care in improving birth outcomes. I have employed an observational study design that is cross-sectional utilizing secondary data to determine the social factors associated with obtaining late prenatal care for low SES black women in Atlanta. The study is observational in that groups were formed by prenatal care utilization (early or late) rather than randomized into treatment and control groups. In this chapter, I will discuss the data, constructs, and methods used to analyze the secondary data sets and address limitations associated with the data, measurement difficulties, and methodological issues. I will use binary logistic regression analysis to study identified agency factors (knowledge/attitude, social support (church, neighborhood, family), family size), structural factors (financial strain, stigma, Medicaid, private insurance), and risk health behavior to prenatal care in black women of low SES. I will also predict prenatal care compliance using OLS regression examining these same factors and risk health behavior. In the second set of analysis, I will use binary logistic regression to analyze these associations' net effects of social factors on birth outcomes, preterm birth and low birth weight.

The second set of analyses will examine the provider's adherence to U.S. Public Health Service Guidelines on content and utilization of prenatal care and its effect on adverse pregnancy outcomes (preterm birth and low birth weight) among low-income black women who attended three clinics in Metro Atlanta. I will use logistic regression to analyze these associations' net effects of social factors on birth outcomes.

Study Population

The sample comes from a study of low income black woman from three health clinics in two Metro Atlanta counties. This is a secondary data analysis of the third phase of a barriers to prenatal care project. The purpose of this study was to examine patient adherence to U.S. Public Health Service Guidelines on content and utilization of prenatal care and its effect on adverse pregnancy outcomes (preterm birth and low birth weight) among low-income black women who attended Southside Medical Centers. This project assessed patient compliance to these comprehensive guidelines on prenatal care content (past medical and obstetric history, physical examination, behavior risk assessment, laboratory birth weight) and compliance. It was hypothesized that patient compliance to prenatal care guidelines reduces the number of preterm birth and low birth weight babies.

Inclusion Criteria

The inclusion criteria for this study was pregnant, black women, 18 years or older that had obtained prenatal care from one of the three clinics within the past two years. The clinic considers active patients as any woman who has sought prenatal care at their clinic site within the past two years. The study excluded any women less than 18, women who did not identify themselves as being black, and women who received prenatal care at the clinic site more than 2 years prior to start of the study.

Sample Size

Using administrative data, black women who obtained prenatal care in the last two years were identified. Since the percent difference between the early and late users of prenatal care

could not be determined with accuracy, the sample size was conservatively estimated. From that identified sample, the sample size was calculated based on the early and late prenatal statistics of 50% with an 80% power and a 95% confidence interval and an odds ratio of 0.5%. The calculated sample size for this secondary data set was 331 women. This was a non-probability sampling that targeted more women to ensure that the sample size was reached.

Recruitment

Based on previous research in the literature, it has been shown that patients relate better to clinic staff and people they are familiar with within the clinic setting. Based on this, we solicited the help of the triage receptionists at each site and they were designated as the key point of contact for the patients in the clinic setting. This individual reviewed the current day's patient load and established if the patient was eligible to participate in our study. When the selected women arrived and were triaged, the receptionist asked the women if they would like to participate in the study. Once verbal consent was obtained, the women were asked to complete the questionnaire while waiting to been seen by the doctor. The women were given specific instructions for completing the question and were encouraged to ask questions. There was no financial incentive offered to complete the questionnaire.

Response Rate

Three hundred and fifty-five (355) women were asked to participate in this study. Out of the 355, three hundred and thirty-one (331) complete the questionnaire with a response rate of 93.2%. Reasons given for not completing the questionnaire were; no incentives being offered, length of the questionnaire, children at clinic visit that required the mother's attention, frustration

with the triage nurse in completion of updated personal and Medicaid information, and not being interested in prenatal care or the quality of care that the patient received at the clinic settings. Of the 355 women approached, 3% of the women were not interested in prenatal care or the quality of care at the clinic sites. Of the 331 women enrolled in the study, 73.7% (244) self-report using late prenatal care while 26.3% (87) self reported early prenatal care use.

Geographic Location

The geographic location of this study is important because it fits into my intersectionality framework. The neighborhoods/counties in which this study takes place are DeKalb and Fulton Counties. The clinic sites are located in low income neighborhoods within Fulton County, GA and DeKalb County, GA. Two of the clinic sites (both satellite sites) were located within public housing sites. The main clinic site is located in an impoverished neighborhood in South Fulton County. The locations of these clinic sites are important because of the limited resources in the surrounding areas. Fulton County Georgia houses the city of Atlanta, which over the past 30 years has seen an influence of blacks relocating to the area. The current African American population is 44%; with 50.8% of this population being female. Within Fulton County, 12.4% of its population live below poverty level which is higher than the national average of 9.2% (U.S. Census, 2000). Fulton County has a LBW rate of 10.3% (County Health Rankings, 2010). DeKalb County, GA is a part of the 13 metro counties that make up Metro Atlanta. The current African American population is 54.5%; with 51.5% of this population being female. Within DeKalb County, 7.8% of its population live below poverty level with is less than the national average of 9.2% (U.S. Census, 2000). DeKalb County has a LBW rate of 9.9% (County Health Rankings, 2010).

The use of late or no prenatal care among these two counties is depicted in Table 3.1 below. Both counties together make up 28.3% of all late or no prenatal care obtain by black women in the state out of 159 counties. Fulton County has, the site in which two clinics are located, has over twice as many black women receiving late or no prenatal care in comparison to their white counterparts. This adds credence to the importance of this study and how this information can help explain why among this group of women prenatal care is not utilized early.

Table 3.1 Comparison of Late or No Prenatal Care (DeKalb & Fulton Counties and Georgia)

Late or No Prenatal Care (2006)	Black	White	Study Population	Percentage of GA Late or No Prenatal Care
Georgia	4.4%	3.6%	N/A	7.8%
DeKalb County	3.0%*	3.3%	37.1%	20.2%
Fulton County	7.8%	3.0%	62.9%	8.1%

*Low reporting rates from private providers.

In Table 3.1, there is a higher rate of infant mortality, preterm birth, and low birth weight for black women in Georgia, DeKalb County and Fulton County. These rates are in some instances more than double the rate in the Southern Region. This study population is relevant because of the high adverse birth outcomes within these two counties.

Table 3.2 Comparison of Low Birth Weight and Preterm Birth (U.S., South, Georgia, and Counties)

	Preterm Birth	Low Birth Weight	Infant Mortality
United States	2.5%	7.7%	6.9%
African American Women in the U.S.	6.3%	17.0%	13.6%
Southern Region	14.2%	8.6%	8.0%
Georgia --Black Women	14.1% 18.4%	9.5% 14.0%	7.9% 12.8%
Fulton County --Black Women	15.6% 19.5%	11.1% 15.1%	8.8% 11.1%
DeKalb County --Black Women	14.5% 16.9%	10.7% 13.4%	8.6% 10.4%

Cross Sectional Survey and Administrative Data

This is a secondary data analysis of two sources of data: a cross sectional survey that was developed to investigate the determinants of and barriers to early prenatal care utilization, derived from focus group discussions, on barriers to prenatal care among adult black women of low socioeconomic status who received prenatal care either early, late or not all in community centers located in low income neighborhoods (described above) and administrative data from medical records that examines the number of preterm and low birth weight infants born among this same study population.. The study was conducted from June 2003 to June 2005.

Administrative Data

Data was collected from information from existing records and/or encounter data. Data was obtained on prenatal care (time of initiation of prenatal care, and number of prenatal care visits), and prenatal contents (past history of medical and obstetric conditions, physical examination, behavior risk assessment, health promotion and laboratory screening). Data was also collected on delivery, type of delivery (normal, c-section, complicated), and demographic characteristics. Information on adverse pregnancy outcomes (low birth weight, very low birth weight, preterm birth, early fetal death, and late fetal death) and postnatal examination were collected from medical records.

Study Limitations

There are several limitations to this study. A major limitation to this data set is that is a sample of women who obtained prenatal care but there is no way to compare this group to women in this community who did not obtain prenatal care. In addition, all the information gathered in the questionnaires are self-reported which we can assume that there is a certain

amount of bias from the answers given. The third limitation is that all the factors listed on the conceptual model all lead to maternal stress, however, there is no variable to measure stress in these data sets. Although stress is not directly measured, financial strain is measuring issues surrounding the lack of or limited financial resources and can be viewed as financial stress. Although there are limitations associated with this study, the need to examine and explain the choices made by black women of low SES about seeking prenatal care is important because they are the group with the highest rates of adverse birth outcomes in Georgia, the Southern Region and the United States.

Constructs

All variables, from the cross sectional survey, are based on self-reported answers on a self-administered survey. I will list variables according to conceptual model (see page 41) from proximate predicators to distal social factors.

Outcome Variables

Timing of prenatal care is generally operationalized as early or on time ($\geq$ 13 weeks of pregnancy (1st trimester)), late (< 13 weeks of pregnancy 2nd or 3rd trimester) or none at all. I use two self-reported questions on the survey to create a binomial measure of late (1) verses early (0) prenatal care. I used administrative data to assess the amount of error in these self reports to gauge the noise in these analyses where there are discrepancies- administrative data will be used.

Table 3.3 Number of weeks Pregnant When Seeking Prenatal Care

Variable	Question	Measurement
Number weeks pregnant when prenatal care started	How many weeks pregnant were you when you started prenatal care?	Early Prenatal care- ≥ 13 weeks of pregnancy (1st trimester) Late Prenatal Care - < 13 weeks of pregnancy (2nd or 3rd trimester)

In the administrative data, the outcome variable will be a compliance variable which is continuous. The perinatal outcome variables for this study are preterm birth and low birth weight. Preterm birth is defined as a live born infant with a gestational age of < 37 weeks without congenital malformation and low birth weight is defined as a live born infant with a birth weight of < 2500 grams.

Several measures for prenatal care and prenatal care compliance will be measured, among them are: time of initiation of prenatal care, and number of prenatal care visits, past history of medical and obstetric conditions, physical examination, behavior risk assessment, health promotion and laboratory screening.

Prenatal care content, from administrative data, is guidelines recommended by the US. Public Health Service to combat adverse birth outcomes. I performed a factor analysis on this set and extracted a single factor labeled prenatal care compliance ranging from 0 to 30. The composite variable will include all 30 items with $\alpha = 0.83$. Women with a score of >25 are non compliant and women who have a score ≤25 are compliant.

The prenatal care index for this study was adapted from the Adequacy Prenatal Care Utilization (APCU) Index. The APCU is a risk assessment that was developed by the Public Health Service Expert Panel on the Content of Prenatal Care (1989). The content of prenatal care consists of activities carried out by prenatal care providers, women, families, and specialized providers to promote health, assess risk status, and intervene in a timely manner so

that the broad objectives of prenatal care are achieved. The scale ranged from 1-20 with 20 being adequate prenatal care. Table 3.4 is a list of prenatal care content or compliance variables.

Table 3.4 Prenatal Care Compliance Variables

Variable	Question	Measurement	Composite Variable Cronbach Alpha α
Prenatal Care Content	Gynecological History Sexual history Medical/Surgical history Infection History Family and genetic History Nutrition History Psychosocial History Smoking Avoidance Drug Use Avoidance Alcohol Avoidance Social Support History Mental Status History Pregnancy Readiness History of Exposure to Terarogene History of Housing Extremes of Physical Activities Physical Exam Laboratory Test Diabetic Screen Breast Exam	Yes No	The composite variable will include all 20 items with a α = 0.83.

Low birth weight, from the administrative dataset, will be measured by a continuous variable birth weight. The item used to measure birth weight is: Birth weight of the newborn in grams (Table 3.5). I will use administrative date to examine the number of women in this study who gave birth to infants with low birth weight. I created a binomial measure of low birth weight (1) verses infants born of normal weight (0).

Table 3.5 Variable Detecting Birth Weight

Variable	Question	Measure
Birth Weight	What is the birth weight at the time of delivery?	Low birth weight = < 2500 grams =1. Normal birth weight >2500 grams =0

Preterm birth, from the administrative dataset, is a continuous variables measured by calculating the number of weeks pregnant upon delivery. The item used to measure preterm birth is the number of weeks pregnant at delivery (Table 3.6). I will use administrative date to examine this number of women in this study who gave birth to infants who were born prematurely or preterm.

Table 3.6 Variable Detecting Preterm Birth

Variable	Question	Measure
Preterm Birth	What week in pregnancy was the infant born?	Preterm birth = births less than 37 completed weeks of gestation =1 Normal gestation = births at greater than 37 weeks of gestation =0

Independent Variables

Knowledge and Attitude about Prenatal Care

Lack of knowledge / attitude about prenatal care is a barrier to early utilization of prenatal care. The less knowledge and unfavorable attitude about pregnancy and prenatal care leads to a reduced chance that women will seek early or timely prenatal care. I use 9 self-reported questions from the survey to create a composite of knowledge/attitude (1) verses lack of knowledge/attitude (0). The Cronbach alpha for these variables was 0.74. I created a single factor variable form these items using confirmatory factor analysis.

Table 3.7 Knowledge and Attitude Variable

Variable	Question	Measurement	Composite Variable Cronbach Alpha α
Knowledge and attitude	I didn't know I was pregnant. I didn't care that I was pregnant. I was using drugs. I wanted an abortion. Prenatal care is not helpful. I was not interested in prenatal care. I didn't think prenatal care was important. I don't like doctors, clinics, or hospitals.	1= Yes 0= No	The composite variable will include all 9 items with a α = 0.74.

Financial Strain

Financial issues can hinder a woman's ability to seek prenatal care. These choices also have an effect on an individual's choices, beliefs and desire to seek prenatal care. The variables for financial strain are spending money on something else, lack of money, free prenatal care services, attitude toward money and birth outcomes. These measures are coded as (1) never to (4) all the time. There is also a binary measure that was coded as (1) Yes and (0) for No (Table 3.8). I created a single factor variable form these items using confirmatory factor analysis. Because questions are measured by both 2 and 4 category responses, the data will be weighted for equal error in each data point, making each point similar and minimizing error in each data point. In addition Medicaid and private insurance will also be examined (both binary measures) as issues associated with financial strain.

Table 3.8 Financial Strain

Variables	Statement	Measurements	Composite Variable Cronbach Alpha α
Financial strain	Instead of spending my money on transportation for prenatal care, I chose to spend it on something else. Lack of money causes me to miss some of my prenatal care appointments. If all of my prenatal services were free, I would attend all my appointments with every pregnancy. Because I did not have the money to take care of a baby, I was happy when I had a miscarriage. No transportation. I didn't know how I would pay for prenatal care. I couldn't find someone to watch the children. I didn't have a way to get to the doctor or clinic.	Never Sometimes Most of the time All the time	The composite variable will include all 8 questions with a α = 0.72.
		Yes No	

In addition, Medicaid and private insurance variables are also included separately as they relate to financial strain. The variables are both binary. Women with insurance are coded as 1 and women without insurance are coded as 0. Women who use Medicaid are coded as 1 and without Medicaid as 0.

Stigma

The variable for stigma is composed of several items presented in Table 3.9: understanding, feelings, and negative attitudes about clinic treatment. The form the questions take are four categories response ranging from never to all of the time. Cronbach's alpha for these variables was 0.73. I created a single factor variable from these items using confirmatory factor analysis. On the factor that will range from 1 to 4 with a mean of 2, a higher score represents higher stigma.

Table 3.9 Stigma

Variable	Statement	Measurement	Composite Variable Cronbach Alpha α
Stigma	The nurses are _____ understanding about my being pregnant again. The nurses _____ make me feel bad that I am pregnant yet again. The doctors at the clinic _____ have a negative attitude about my being pregnant again.	All of the time/Always Sometimes Most of the time Never	The composite variable will include all 3 questions with a α = 0.73.

Social Support

The literature has shown that there is a link between social support and improved birth outcomes (LaVeist, 2005; Lee et al. 2009). The variables for social support used in this analysis are: neighborhood support and church support s. I create two factor variables using confirmatory factor analysis for both neighborhood and church support. Family support was not included in the analysis because it is highly correlated with family size.

Table 3.10 Social Support Variables

Variables	Question	Measurement	Composite Variable Cronbach Alpha α
Church Social Support	I feel comfortable talking to my pastor/other church leaders about my problems. The church provides support for me during my pregnancy.	Never Sometimes Most of the time Not at all Not a member of a church*	The composite variable has a with an α = 0.67.
Neighborhood Social Support	I feel that it is _____ to have strong social support during my pregnancy.	Very important Somewhat important Not important	The composite variable has an with an α = 0.65.
	I feel that not having support is _____ for my pregnancy.	1-Very good 2-Good 3-Bad 4-Very bad	
	My family members will give me a ride to my prenatal care appointments. My family supports my decision to have this baby.	Never Sometimes Most of the time Not at all	

Family Size

Family size is another independent variable that can prove to be a barrier for women seeking early or timely prenatal care. Family size will be measured using number of children and number of adults, and combined number of children and adults to create family size. The variable used in the analysis is the combination of both children and adults. Because of the large number of children in comparison to adults in some households, the variable was created by doing a weighted sum. A weight sum is used when performing a sum, integral, or average in order to give some elements more "weight" or influence on the result than other elements in the same set (Daniel, 1987).

Table 3.11 Family Size Variables

Variables	Question	Measurement
Family Structure	Number of children	Number of children
	Number of adults	Number of adults
	Family size	Sum of children plus adults

Health Risk Behavior

Health risk behavior is a result of coping with stressors from financial strain, stigma, limited or no social support, etc. Health risk behavior has an effect on an individual's choices and health beliefs and has an effect on an individual's ability to seek prenatal care. The variable for health risk behavior is composed of several items presented in Table 3.12: smoking cigarettes, drinking alcohol, and use of illegal drugs. The form the questions take are four categories response ranging from never to all of the time. On the factor that will range from 1 to 4 with a mean of 2, a higher score represents higher health risk behavior.

Table 3.12 Health Risk Behavior

Variable	Question	Measurement	Composite Variable
Health Risk Behavior	During my pregnancy, I smoked cigarettes: During my pregnancy, I drank alcohol (beer, whiskey, wine). During my pregnancy, I used drugs (crack, marijuana, cocaine, and other drugs to make you high).	Never Sometimes Most of the time All the time	No composite variable

Controls

Demographic information was collected for all participants in the study. These measures include age (calculated from date of birth at time of recruitment), ethnicity (race/ethnicity was collected because although all the women in the study were black there was a possibility that

they were not all African American); marital status, level of education, Medicaid status, insurance status, number of pregnancies, etc.

Data Analysis

This study examines the predictability of barriers to early or timely use of prenatal care and its effect on adverse birth outcomes. In addition, this study will also examine prenatal care compliance and its effects on adverse birth outcomes. Statistical Package for Social Sciences (SPSS Version 18) will be used to conduct descriptive and analytic analyses will be performed. I will use logistic regression to examine timing of prenatal care and birth outcomes and ordinary least squares (OLS) regression methods to examine prenatal care compliance.

Logistic Regression

Logistic regression is commonly used for the analysis of binary outcomes variables. Logistic regression is used for dependent variables that are dichotomous. There are five fundamental assumptions based on the logistic model (Allison, 2001). These assumptions are: the dependent variable is binary, the dependent variables are statistically independent of each other, the dependent and independent variables are not linearly related, outliers cannot be present, and the logistic regression model assumes that the observed X variables are fixed and not random (Prophet, 1998).

The binary logistic regression models predicting late prenatal care utilization, preterm birth, and low birth weight will display odds ratios and confidence intervals. The odds of these events occurring are defined as the probability of the outcome event occurring divided by the probability of the event not occurring (Allison, 2007). The odds ratio for a predictor is defined as

the relative amount by which the odds of the outcome increase (O.R. greater than 1.0) or decrease (O.R. less than 1.0) when the value of the predictor variable is increased by 1.0 units. This is illustrated by the equation below where PV is the value of the predictor variable:

OR= (odds for PV+1)/(odds for PV)

The confidence intervals will be used to provide the variability in the estimates of the coefficients. Confidence intervals all reasonable confidence that the true value of coefficients fall between the calculated range. This study will use a 95% confidence interval.

Models

I will use the model building approach to the analysis. I will first examine the agency factors. Secondly, I will examine structural factors, and lastly I will estimate a full parsimonious model. The parsimonious models will only contain variables that are significant predicators of the dependent variables in the nested models. The z-scores for all variables will be used for both binary logistic regression and OLS regression.

For the binary logistic regressions models, I will report the odds ratios (OR) for each variable included in the model. Because the sample size is so small, I will use confidence intervals (CI) to determine significance instead of the significance provided by SPSS (Allison, 2001). Odds ratios that have a confidence interval where both the lower and upper are less than or greater than one (1) will be reported as significant. Any confidence interval that includes one (1) within the interval will not be reported as significant.

Model Fit

Model fit is determined by examining the summary measures. Model fit allows for a comparison between the full model and a reduced model. Model fit can be used to examine reliability, deviance, and tracking the fluctuation in the level one and level two variances. I will use deviance. Deviance is a statistic that utilizes the χ^2 distribution. The lower the deviance the better the fit. I will use the -2LLog Likelihood to examine goodness of fit across models. The deviance is equal to twice the positive difference between the log-likelihood for the fitted model and the log-likeihood for the saturated model (Allison, 2001, Daniel, 1987). The chi-square distribution (using the difference between both -2llog likelihoods) and degrees of freedom will be used to determine which model is the better fit (Allison, 2001, Daniel, 1987).

The dependent or outcome variables in this study that will be evaluated using logistic regression are low birth weight, preterm birth, and timing of prenatal care. The equations are below.

1). Log $[\frac{\text{late prenatal carei}}{1-\text{late prenatal carei}}] = \alpha + \text{knowledge/attitude}_1 X_{i1} + \text{Financial strain}_2 X_{i2} + \ldots\ldots \beta_k X_{ik}$

2). Log $[\frac{\text{pretermbirthi}}{1-\text{preterm birthi}}] = \alpha + \text{knowledge/attitude}_1 X_{i1} + \text{Financial strain}_2 X_{i2} \ldots\ldots\ldots + \text{timing of prenatal care}_k X_{ik}$

3). Log $[\frac{\text{low birth weighti}}{1-\text{low birth weighti}}] = \alpha + \text{knowledge/attitude}_1 X_{i1} + \text{Financial strain}_2 X_{i2} \ldots\ldots\ldots + \text{timing of prenatal care}_k X_{ik}$

Table 3.13 is a sample model of logistic regression that will be used in this study.

Table 3.13 Sample Model

Late Prenatal Care Utilization					
	Model 1	Model 2	Model 3	Model 4	Model 5
	O.R. (CI)	O.R. (CI)	O.R. (CI)	O.R. (CI)	O.R. (CI)
Agency Factors					
Family Size	XX		XX	XX	XX
Knowledge/Attitude	XX		XX	XX	XX
Church Support	XX		XX	XX	
Neighborhood Support	XX		XX	XX	
Structural Factors					
Financial Strain		XX	XX	XX	
Private Insurance		XX	XX	XX	
Stigma		XX	XX	XX	
Control Variables					
Age				XX	
Single				XX	
High School Graduate				XX	
Risk Health Behavior					
Risk Health Behavior				Xx	
Constant (Intercept)	XX	XX	XX	XX	XX
R^2	XX	XX	XX	XX	XX
-2 Log likelihood	XX	XX	XX	XX	XX

Ordinary Least Squares (OLS)

The goal of ordinary least squares (OLS) regression is to produce estimates of the effects of the independent variables on the dependent variables that are unbiased and efficient (Allison,1999). Unbiased coefficients exist when there is no systematic tendency to over or under estimate the independent variable's effect on the dependent variable. On average if there are overestimations and underestimations, they will balance themselves out if the method is unbiased. The efficiency represents how much variation is around the true value. There are five assumptions made in OLS regression. The assumptions are: linearity, mean independence, homoscedasticity, uncorrelated disturbances, and normal disturbances (Allison, 1999).

The first assumption is linearity. Linearity means that the relationship between the independent (X) and dependent variables (Y) is linear. The second assumption is mean independence. With mean independence, the mean of the random disturbance term (U) is zero.

The third assumption of OLS regression is homoscedasticity. Homoscedasticity means that the degree of random noise is always the same, regardless of the values of the independent variables (Gujarati, 1995 & Allison, 1999). The fourth assumption is uncorrelated disturbances. Uncorrelated disturbances are when the value of the disturbance terms (U) for an individual in the sample is uncorrelated with the value of the disturbances term (U) for any other individual in the sample (Allison, 1999). The fifth assumption is normal disturbances. This assumption is the least important assumption of OLS regression. The random disturbances term (U) has a normal distribution. If you have a large sample size (over 200 cases) you can use this assumption (Allison, 1999). If the sample is small, you need normality of the disturbance term (U) to guarantee the confidence intervals and *p* values will be accurate. To check for this assumption with small data sets, you have to calculate the residuals from the regression and see if they are somewhat normally distributed.

The models display the unstandardized regression coefficient (b) and the standard error. The Unstandardized regression coefficient indicates the change in the dependent variable for each increase or decrease in the independent variable (Vogt, 1999). The unstandardized coefficient is dependent on the unit of measure of the independent variables and cannot be compared with other independent variables with different units of measure in the model. The standard error of the estimate can be interpreted as the standard deviation of the variable after the effects of the independent variable has been removed (Allison, 1999).

In this study, I will be using OLS linear regression to examine prenatal care compliance. The OLS equation for prenatal care compliance is below.

4). Prenatal care compliance = A (intercept) + $gynhistory_1X_1$ + $sexhistory_2X_2$ + ……..$B_{20}X_{20}$ + U (random disturbance).

Table 3.14 is a sample model of prenatal care compliance and birth outcomes.

Table 3.14 A Sample Model of Prenatal Care Compliance and Birth Outcomes

Prenatal Care Compliance					
	Model 1	Model 2	Model 3	Model 4	Model 5
	b (S.E.)	b (S.E.)	b (S.E.)	b (S.E.)	b (S.E.)
Agency Factors					
Family Size	XX		XX	XX	
Knowledge/Attitude	XX		XX	XX	
Church Support	XX		XX	XX	XX
Neighborhood Support	XX		XX	XX	
Structural Factors					
Financial Strain		XX	XX	XX	
Private Insurance		XX	XX	XX	
Stigma		XX	XX	XX	
Control Variables					
Age				XX	
Single				XX	
High School Graduate				XX	
Risk Health Behavior					
Risk Health Behavior				XX	
Constant (Intercept)	XX	XX	XX	XX	XX
R^2	XX	XX	XX	XX	XX

In Chapter 4, I provide univariate and bivariate analysis to examine relationships between independent and dependent variables. Chapter 5 discusses the results of binary logistic regression of predictors of late prenatal care utilization and OLS regression and the predicators of prenatal care compliance. Chapter 6 provides the results of binary logistic regression of predictors of preterm births and low birth weight. Finally, Chapter 7 provides a discussion of the implications, limitations and recommendations based on the study results.

CHAPTER FOUR:

DESCRIPTIVE AND BIVARIATE RESULTS OF THE SAMPLE POPULATION

In this chapter, I provide univariate statistics in Table 4.1 in order to provide a clear picture of the sample of Southern black women with low socioeconomic status. In Table 4.2, I provide a bivariate analysis of both independent and dependent variables in order to make sure with such a small sample, I do not have multicollinearity. Furthermore, I examined bivariate associations with the outcomes to see which were more predictive of the outcome variables. Models were limited to those with medium to larger associations because of the small sample size.

Table 4.1 shows that the average age for this study population was 24 years of age while the national average of black women of low socioeconomic status delivering their first baby is 16 years of age (Future of Our Children, 2002). Over 85% of the sample reported being currently unmarried with children which is over three times the national average of 26% illustrating that this group of women is very different from the "typical" black women in the U.S (Primus, 2002).

Over 80% of the study population reported not graduating from high school. The average educational attainment reported was some high school (75.5%). Less than 20% of the women reported obtaining a high school diploma. The national average for black women is 37% who are high school graduates (U.S. Census, 2009). Just under 5% of the sample reported reaching middle school or junior high only and less than 1% only attended elementary school. Thus, this sample of women are older than the typical age of Southern black women at first birth, have less education than average, and are more likely to be unmarried with children.

For this study population, over 60% of the population was unemployed. Less than 37% reported being employed (a combination of both full and part time employment). The

unemployment rate for black women nationally is 12.7% (Bureau of Labor Statistics, 2010). This study population has an unemployment rate of almost five times the national average. The income status reported by the study population coincided with the employment status and education attainment. Over 69% of the women reported earring < $10,000 per year. Over 22% of the women reported earning between $10,000 to $20,000 and another 4.8% reported earning between $20,000 and $30,000. Only 2% of the population reported earning more than $30,000. Based on income, over 90% of these women live below the poverty line. Nationally, over one third (38%) of black single mothers live below the poverty line.

Based on reported income, it is no surprise that over 82% of the women reported being on Medicaid and other government assistance (welfare, WIC, Section 8 Housing, etc). The national average for black women on Medicaid is 21.9% (Health Chart book, 2009). Only 17.2% reported have private insurance such as Aetna, BlueCross, and other insurance providers while the national average is 23.8%. The national average for black women with private health insurance is 22.4% (Kaiser, 2009).

The number of pregnancies, stillborn deaths and abortions were also reported by the study population. The average number of children per household was 3.32 while the national average is 3.05 (Rector, Johnson, Fagin, 2004). Both the average rates for stillborn births and abortions were less than 0.5% within this population (146 abortions were reported and 9 stillborn births).

Late prenatal care use among this group was 73.1% while the national rate for black women is 24.8 (HRSA, 2002). Late prenatal use among this group is almost three times the national rate. Early prenatal care use for this population was 26.9% and the national average is 75.2%. The results of this late prenatal care use could result in adverse birth outcomes. Both

preterm births (72.8%) and low birth weight (66.5%) were extremely high compared to the national averages of 18.4% and 14% respectively (March of Dimes, 2007). This group of women faces different circumstances based on their situation created by the agency and structural barriers that they face every day.

Descriptive Statistics

The independent variables for agency and structural factors are also included in Table 4.1. The average family size in this study has 5.40 people living in the home. The overall range for this study population was 2 to 15 people living in any given household. Women who are knowledgeable and have good attitudes about pregnancy in this population was 57.4%. This illustrates that less than half did not have knowledge and had bad/harsh attitudes about prenatal care and pregnancy. In addition, over 70% of the women reported having church social support and 44.7% having neighborhood support.

The structural factors in this study include both financial strain and stigma. Over 75% of the study population reported financial strain and stigma from experiences with healthcare providers. The agency and structural factors are difficult to compare to the national figures as these variables may be measured differently depending on the research study.

Univariate Analysis

In this analysis, both income and Medicaid were dropped as variables to eliminate the chance of multicollinearity. A large portion of the populations (82.8%) are Medicaid recipients. This means that a large portion of the sample cannot afford private health insurance but have

some coverage through government assistance. Also, the variable income was not included from the analysis. I have included financial strain which is a factor of limited income.

The results in Table 4.1 show that there is little variation among this group of women when examining education, marital status, private insurance status, employment status, marital status, and late prenatal care use. This limited variation among the group will be discussed in Chapter 7 as a study limitation.

Table 4.1 Descriptive Statistics of Sample Population: mean and (Std. Dev.) and Percentages

	Mean (Std Dev)/ Percentage	Range		Mean (Std. Dev)/ Percentage	Range
Age			**Agency Factors**		
Average Age	**24.35 (5.320)**	**18-44**	**Family Size**	**5.40 (2.585)**	**2-15**
Single			**Knowledge/Attitude**		
Yes	85.8%		Yes	57.4%	
No	14.2%		No	42.6%	
High School Graduate			**Church Support**		
No	81.3%		Yes	70.1%	
Yes	18.7%		No	29.9%	
Employment Status			**Neighborhood Support**		
Yes	36.8 %		Yes	44.7%	
No	63.2%		No	55.3%	
Medicaid Recipient					
Yes	82.8%		**Stigma**		
No	17.2%		Yes	75.5%	
			No	24.5%	
			Risk Health Behavior		
			Yes	49%	
			No	51%	
Private Insurance					
Yes	17.2%				
No	82.8%				
Dependent Variables					
Timing of Prenatal Care					
Early Prenatal Care (<13 weeks)	26.3%				
Late Prenatal Care (> 13 weeks)	73.7%				
Prenatal Care Compliance		**1-30**			
Yes	10.6%				
No	89.4%				
Preterm Births					
Yes	72.8%				
No	27.2%				
Low Birth Weight					
Yes	66.5%				
No	33.5%				

Bivariate Analysis

In the next stage of the analysis, I used bivariate statistical analysis to assess which variables are appropriate to use for complicated models and a small sample size. Before testing each hypothesis, bivariate correlations were examined for all the independent and dependent variables. I used the Pearson‘s R to determine the strength of the linear association between the variables and to discover the existence of any significant bivariate relationships between the variables. A correlation matrix with both independent and dependent variables is presented in Table 4.2. The relationship or correlation between variables will be discussed below. Some variables will be omitted from the model due to multicollinearity.

Table 4.2 Bivariate Correlations of Independent Variables for Agency and Structure Factors

	Family Size	Knowledge/ attitude	Church Social Support	Neighborhood Support	Financial Strain	Private Insurance	Stigma	Medicaid	Timing of PNC	PNC Compliance	Preterm Births	Low Birth Weight
Family Size	1	**-.272****	.008	**-.170****	**.134***	.057	-.090	.060	**.154****	.085	.000	-.013
Knowledge/ Attitude		1	.024	**.128***	-.030	.077	.050	.017	**-.149****	-.069	.020	.035
Church Social Support			1	.062	.001	-.089	**.211****	-.066	.070	**-0.127***	.025	-.023
Neighborhood Support				1	-.040	.012	-.050	-.025	.016	-.013	.037	.099
Financial Strain					1	-.024	-.059	-.048	-.091	-.050	.011	-.014
Private Insurance						1	**-.128***	**.666****	.023	-.012	-.050	-.101
Stigma							1	**.110***	.031	-.071	.031	.027
Medicaid								1	.070	-.017	-.055	-.093
Timing of PNC									1	.096	.043	.030
PNC Compliance										1	.096	.082
Preterm Births											1	**.645****
Low Birth Weight												1

*. Correlation is significant at the 0.01 level (2-tailed); **. Correlation is significant at the 0.05 level (2-tailed)

Family Size

The results of the bivariate analysis show that there are significant correlations between family size and knowledge and attitude (-.272**), neighborhood support (-.179**), financial strain (.134*), and timing of prenatal care utilization (.154**). Both knowledge and attitude and neighborhood support have a negative association with family size, while financial strain and timing of prenatal care utilization is positively associated with family size. Family size could be negatively associated with knowledge/attitudes because women with multiple children often seek late or no prenatal care because women who have been pregnant more than once already know what to do during pregnancy based on previous experience. This has been identified as a barrier to early prenatal care use in previously qualitative research studies (Daniels et al, 2006; Houge, 2007; Orr, 2004).

The Negative association between family size and neighborhood support could be due to the conflict between family members that lead women to seek neighborhood social support that they are not receiving at home. Studies have shown that there is conflict between pregnant women and their mothers and boyfriends/husbands during pregnancies (Berstein, 1996; Miller, 1992; Orr, 2002). Large family size, made up mostly of children, and neighborhood support can both be viewed as a form of social support.

The positive association between family size and financial strain is also an association that has been illustrated in previous studies. The larger the family size, the more likely a women will have financial strain. This financial strain can be due to additional children and/or extended family which can lead to financial strain because of extra expenses for food, shelter, educational expenses for children, transportation, etc.

There is also a positive association between family size and timing of prenatal care utilization. Studies have shown that families with a large number of family members living in

the household, as is the case in this study, has a direct effect on timing of prenatal care utilization. Large family size can create stressful life situations, additional financial strain, and logistic obstacles that might deter a woman from seeking or receiving early prenatal care (Braverman et al, 2000; Daniels et al, 2006; Houge et al, 2007; Riley et al, 2003).

Knowledge/Attitude

The results of the bivariate analysis show that there are significant correlations between neighborhood support and timing of prenatal care utilization. There is a positive relationship between knowledge/attitude (.128*) and neighborhood support, while timing of prenatal care utilization (-.149**) is negatively associated with knowledge/attitude. The greater the neighborhood social support the more knowledge and better attitude a woman may have about pregnancy and prenatal care. This positive relationship can be due to women learning about pregnancy and prenatal care through community based organizations offering support through d group prenatal care sessions, community health fairs, and extended family (comprised mostly of women) and neighborhood women who offer advice and support about their pregnancy and prenatal care.

As mentioned earlier, the majority of the women in this study have large family units. These large family units bring about many social barriers, such as poverty, maternal stress, lack of childcare, all which are issues that oftentimes effects the timing of prenatal care use. Also, because a large number of these women have on average at least five or more people living in their household, with a large number being children, they have previous knowledge and developed attitudes about their previous pregnancy experience which leads to late or no prenatal care utilization (Houge, 2007; Braveman, 2005; Lane, 2003).

Church Social Support

The bivariate analysis results show that there is a positive relationship between church social support and stigma (.211**), while there is a negative association between church social support and prenatal care compliance (-0.127*). The more church social support a woman has the larger the possibility of the woman feeling stigmatized or expressing stigma toward the healthcare system and providers within that system. This may be due to historical events such as Tuskegee or the experience of others told during church gatherings, testimonial services and other church functions about negative experiences within the healthcare system.

The negative association between church social support and prenatal care compliance could also be linked to the past historical events and negative experiences with healthcare providers and the overall health care system. These shared experiences can effect whether or not low income black women seek all recommended services during their pregnancy. Bad experiences about certain procedures or tests during pregnancy can be passed on by word of mouth or during church gathers such as noon day pray, alter call, health ministry meetings (all which are times that women or families seek pray for negative experiences that they have experience which could include healthcare experiences).

Private Insurance

There are significant correlations between private insurance and stigma (-.128*) and Medicaid (.666**). The negative association between stigma and private insurance shows that if a woman has experienced stigma she probably does not have private insurance. Studies have shown that women with private health insurance receive better healthcare and treatment than women who receive public assistance (Lane, 2003; Abraham, 1993). These women are more

likely to have Medicaid to pay for healthcare services. It is also important to note here, that pregnant women automatically qualify for Medicaid once their pregnancy is confirmed. It is during that pregnancy confirmation clinic visit that women are offered Medicaid services (CMS, 2011).

Women who receive Medicaid often seek prenatal care services at community health clinics or Federally Qualified Health Centers (FQHCs). These clinics are often times associated with crowded clinics, rude staff, and long wait time that is often associated with the limited healthcare facilities in impoverished neighborhoods. All these factors have been associated with women feeling stigmatized by their healthcare providers (Hogue, 2001; Riley, 2003). Because the correlation between private and insurance and Medicaid is so high, Medicaid will be removed from the analysis to reduce the chances of multicollinearity.

Based on the bivariate analysis, there are no real problems with multicollinearity except for insurance and Medicaid; family size and family social support; and financial strain and income. Because multicollinearity could be an issue with these variables, (family social support, Medicaid, and income) they were eliminated from the data analysis. Only a few independent variables show any correlation with other variables.

Dependent Variables

I also examined the relationships between the dependent variables prenatal care utilization, prenatal care compliance, preterm births and low birth weight in Table 4.2. Because the Pearson Correlation between timing of prenatal care utilization and compliance and the adverse birth outcomes (preterm births and low birth weight) are fairly low ranging from .030 to .096, there is no chance that timing of prenatal care utilization and compliance will predict

preterm births and low birth weight in this study population. There is a high correlation between preterm birth (.645**) and low birth weight. This is expected because babies that are born preterm are often born with low birth weight. This will be discussed in Chapter 7 but will not be included in the analysis.

In this chapter, I examined the correlation between independent variables and dependent variables. By doing bivariate analysis, I was able to identify and eliminate variables that could possible cause multicollinearity in the logistic regression and OLS models. The findings show that family social support, income and Medicaid should be eliminated from further analysis. In addition, the results also show that there is limited, if any, correlations between all the other independent variables.

The results also show that this study population and sample are atypical from the samples normally selected to examine barriers to prenatal care utilization, prenatal care compliance and adverse birth outcomes. Previous studies have examined these issues by looking at the racial differences but few, if any, have examined within group issues quantitvately.

CHAPTER 5:

FACTORS AFFECTING TIMING OF PRENATAL CARE UTILIZATION AND PRENATAL COMPLIANCE

In this chapter, I will analyze factors that affect the timing of prenatal care utilization and prenatal care compliance. In the first half of the chapter, I will regress agency factors: social support (church and neighborhood), family structure, and knowledge/attitude; structural factors (financial strain, stigma, and private insurance); control variables: age, currently single (marital status), and education; and risk health behavior on late prenatal care utilization. The first half of this chapter will use late prenatal care utilization as the dependent variables. I will examine the effect of maternal stressors that may influence the decision to seek early or late prenatal care among low income black women in the South. In the second half of this chapter, I will use ordinary least squares (OLS) linear regression to examine various levels of prenatal care compliance among the same agency, structural, control variables, and risk health behavior.

From previous research, we know that black women of low socioeconomic status seek late prenatal care more often than any other racial group. This analysis seeks to determine what factors within this group lead some to obtain late prenatal care. In addition, this study can provide a within group examination of how independent barriers, previously identified in the literature, intersect to provide a different explanation for how these barriers affect prenatal care timing and compliance within this group. I expect to find that structural issues such as stigma and insurance will play key roles as to why women seek prenatal care. I also expect to find that single parent homes have an effect on both timing of prenatal care and compliance. In addition, I also expect that level of education and employment status will have an influence on both timing of prenatal care and prenatal care compliance.

Analysis and Findings

Late Prenatal Care Utilization

Agency Factors

Table 5.1 presents estimates from logistic regression analysis examining late prenatal care utilization versus early prenatal care utilization regressed on variables representing agency factors such as church and neighborhood social support, family size, and knowledge/attitudes about pregnancy and prenatal care. Model 1 does not contain structural or control variables. This model estimates coefficients for agency predictors on late prenatal care unconditionally.

With regards to family size, I expected women with large families to seek late prenatal care in comparison to women with smaller family units, based on Hypothesis H1 and based on previous research findings of St. Clair, Smeriglio, Alexander, and David, and Braverman, Marchi, Egerter, Pearl and Nuehaus (St Clair et al, 1989; Braverman et al, 2000). The results support this hypothesis. A one standard deviation increase in family size is associated with a 33.5% increase in the odds of late prenatal care utilization. Also in Model 1, knowledge/attitude reached significance. A one standard deviation increase in knowledge/attitude is associated with a 24% decrease in the use of late prenatal care utilization. In Model 1, family size, knowledge/attitude, church social support, and neighborhood support are included, both family size and knowledge/attitude are significantly associated with late prenatal care utilization. The pseudo R^2 for this model is relatively low (.063). This indicates that only 6.3% of the variances in late prenatal care utilization is explained by family size, knowledge/attitude, church and neighborhood social support.

The lack of knowledge and negative attitudes about pregnancy and prenatal care has been shown to be a barrier to early prenatal care in previous research (Hogue et al, 2007; Riley, 2003;

Daniels et al, 2006; Alexander et al, 2002; Hoebl et al, 2008; Luo et al, 2006). The majority of these studies are qualitative with the major aim of the research being to identify barriers or confirm preexisting barriers already in the literature (Daniels et al, 2006; Hogue et al, 2007; Rowley, 2003). The findings in this study support previous finding in the literature that show that lack of knowledge and negative attitudes about pregnancy and prenatal care are both barriers to black women of low socioeconomic status seeking early prenatal care. Hypothesis H2 is supported by the results of this analysis. These results show that the more knowledge a woman has about signs and symptoms of pregnancy and prenatal care and a positive attitude toward pregnancy will increase early prenatal care use.

Both church and neighborhood support were regressed on late prenatal care. However, they did not reach significance. This is does not lend support to H3 that women who have social support will have increased early prenatal care use. This may be due to the limited variation within this study population.

Structural Factors

Model 2 presents estimates for the following structural factors: financial strain, private insurance, and stigma associated with healthcare providers. None of these factors reach significance in Model 2. Hypothesis 4, women who are affected by financial strain are less likely to seek early prenatal care is not supported by the results of this analysis. Hypothesis 5 is also not supported by these results. Stigma that is associated with this group of women does not predict late prenatal care utilization. Hypothesis H6, women who have private insurance are more likely to see early prenatal care, is also not supported by these results.

Based on the findings in Table 4.1, I found little variation between the structural issues among this study population. Nearly 76% of this population has reported financial issues that have led to financial strain. Within this same population, over 82% of the population reported not having private insurance and using Medicaid to pay for prenatal care services. In addition, 75.5% of the women also reported being stigmatized by the clinic staff. This limited variation can help explain why only 0.4% of the variances in late prenatal care utilization can be attributed to structural barriers.

Agency and Structural Factors

Model 3 combines both agency and structural factors in a single model. Both family size and knowledge/attitude remain significant. Both are attenuated across Models by 0.7% and 0.9% respectively. A one standard deviation increase in family size is associated with a 32.5% increase in the odds of late prenatal care utilization. Also, a one standard deviation increase in knowledge/attitude is associated with a 24.7% decrease in the use of late prenatal care utilization. These results continue to support Hypotheses H1 and H2. The pseudo R^2 in this model remains relatively low (.064) due in large part to the fact that none of the structural variables are significant. This indicates that only 6.4% of the variances in late prenatal care utilization are explained by combined agency and structural factors.

Agency Factors, Structural Factors, Risk Health Behavior

Model 4 controls for age, marital status, education, and adds risk health behavior. Net of risk health behavior both family size and knowledge/attitude both lose significance across Models 3 and 4. The pseudo R^2 in this model is relatively low (.069). This indicates that only

6.9% of the variances in late prenatal care utilization is explained by combined agency and structural factors, and risk health behavior. I also compared model fit across Models 3 and 4. In comparing Model 3 to Model 4, the -2LLog likelihood decreases across models by 8.107 on four degrees of freedom which shows that there is no significant improvement of model fit for Model 4. Therefore, Model 3 is the best model.

Although I expected to find, based on the previous research of Fiscella; and Alexander, that risk health behavior is a barrier to early prenatal care use, I did not find this to be the case in this analysis (Fiscella, 1995; Alexander, 1995). These results do not lend support to Hypothesis H7 that risk health behavior has a negative effect on early prenatal care utilization. Once again, this could be explained with the lack of variation between this group with the majority of the women using Medicaid to pay for prenatal care services.

Parsimonious Model

In Model 5, I created a parsimonious model consisting on significant predictors of late prenatal care utilization across Models 1-4. This model consists of family size and knowledge/attitude about pregnancy and prenatal care. Both remain significant when excluding all other agency, structural, control, and risk health behavior variables. The results show that a one standard deviation increase in family size is associated with a 31.3% increase in the odds of late prenatal care utilization. Also, a one standard deviation increase in knowledge/attitude is associated with a 22.5% decrease in the use of late prenatal care utilization. These results continue to support Hypotheses H1 and H2. The pseudo R^2 in this model is relatively low (.050).

Model Fit

I also compared the model fit for Models 1-3. Comparing Models 1 and 3, the -2LLog likelihood decreased across models by 2.195 on three degrees of freedom which shows that there is no significant improvement of model fit for Model 3 over Model 1. In comparing Model 2 to Model 3, the -2LLog likelihood decreases across models by 14.746 on three degrees of freedom which shows that there is significant improvement of model fit for Model 3. Lastly, I compared Model 3 to Model 5. I found that the -2LLog likelihood decreased across models by 5.459 on five degrees of freedom which shows that there is significant improvement in the parsimonious model (Model 5). In comparing the models, Model 5 is the best model in predicting late prenatal care utilization.

Table 5.1 Estimates of Late Prenatal Care Utilization Regressed on Agency and Structure Factors and Health Risk Behavior Based on Logistic Regression (N=331)

Late Prenatal Care Utilization					
	Model 1	Model 2	Model 3	Model 4	Model 5
	O.R. (CI)	O.R. (CI)	O.R. (CI)	O.R. (CI)	O.R. (CI)
Agency Factors					
Family Size	1.335* (1.041- 1.713)		1.325* (1.029- 1.708)	1.277 (.974-1.674)	1.313* (1.027- 1.678)
Knowledge/Attitude	.760* (.594- 973)		.753* (.587- .966)	.787 (.598- 1.035)	.775* (.608- 989)
Church Support	1.192 (.948- 1.498)		1.166 (.921- 1.477)	1.171 (.920- 1.489)	
Neighborhood Support	1.117 (.880- 1.419)		1.120 (.880- 1.425)	1.158 (.902- 1.486)	
Structural Factors					
Financial Strain		1.058 (.844- 1.327)	1.021 (.808- 1.289)	1.028 (.811- 1.303)	
Private Insurance		1.062 (.846- 1.332)	1.087 (.859- 1.375)	1.110 (.867- 1.421)	
Stigma		1.085 (.864- 1.362)	1.102 (.867- 1.401)	1.155 (.902- 1.479)	
Control Variables					
Age				1.076 (.795- 1.457)	
Single				.970 (.761- 1.236)	
High School Graduate				.922 (.727- 1.171)	
Risk Health Behavior					
Risk Health Behavior				.904 (.717- 1.139)	
Constant (Intercept)	1.972***	1.924***	1.987***	1.948***	1.958***
R^2	.063	.004	.064	.069	.050
-2 Log likelihood	410.729	423.280	408.534	400.427	413.993

$^{+}$ p <.10 * p < .05 ** p < .01 *** p <.001 Key: O.R. - Odds Ratio (Confidence Interval (CI)

Prenatal Care Compliance

In Table 5.2, I present OLS linear regressions of prenatal care compliance to examine the effects of agency, structural, control, and risk health behavior variables in predicting prenatal care compliance. Through this analysis, I hope to uncover possible explanations for variance in levels of prenatal care compliance. From an agency prospective, I expect that various levels of social support, knowledge/attitudes and family size, would have an effect on prenatal care compliance. I also expect the same for structural variables and risk health behavior. By better understanding why this group of women is generally noncompliant in seeking all recommended prenatal care services, policy makers can better understand what the barriers are and can work to improve access, and quality of care to improve prenatal care compliance.

Analysis and Finding

Agency Factors

Model 1 introduces the agency variables. This model will allow for a better understanding of agency factors on prenatal care compliance before other variables are added to the model.

I expected that family size would play a role in predicting prenatal care compliance. This expectation is based on previous studies that show that family size plays a role in women seeking prenatal care and compliance with recommended prenatal care services (Kim et al 2006; Fiscella, 1996; Haas et al 1996). However, in this analysis, family size was not effective in predicting prenatal care compliance among this study population. This did not lend support to Hypothesis 8 that women who are a part of a large family structure will comply with recommended prenatal care services.

The results of this analysis also did not support Hypothesis H9, women who have more knowledge/attitude about pregnancy and prenatal care will be more complaint. Also, trust may play a role in women of low socioeconomic status not attending and adhering to all the recommended clinic visits. Distrust, as discussed in the introduction, is deeply rooted in the black community. This distrust is generated from historical events such as the Tuskegee Syphilis Experiment and the Henrietta Lacks (HeLa) cells story. This distrust can lead to limited clinic visits. For women who have been pregnant more than once, they may feel that they know enough from their previous experiences and knowledge about child birth and prenatal care that they can avoid the medical system all together. Once again, this non significance may be due to the lack of variation with such a small sample size.

When examining social support, church support was significant in this model. Church social support reaches significance with a b= .124. This result shows that every one standard deviation increase in church social support women are more likely to reach prenatal compliance. This supports Hypothesis 10 that women with church support will be more compliant with recommended prenatal care services throughout their pregnancy. On the other hand, neighborhood support did not reach significance in Model 1. The pseudo R^2 for Model 1 is .025 which indicates that 2.5% of the variances in predicting prenatal care compliance are explained by the variables in this model.

These findings contradict previous qualitative research studies. Perhaps these findings show that neighborhood support is not consistent support that this group of women can depend on. These women are constantly moving from place to place, constant means of communication changes or are no longer available. There are a number of different reasons that may provide answers as to why neighborhood support was not significant in this model. Although these

women move around, in the black community, a church “home” (a place where a person has church membership) is constant. The church is a stable influence in their lives and most black people remain committed to a single church home because of strong friendships and fellowship with the pastor and other church members.

Since most of the previous research on examining timing of prenatal care utilization and prenatal care compliance is qualitative, researchers should take a closer look at the results and consider that the majority of the results are self-reported in the form of focus group discussions and key informant interviews that cannot or should not be generalized among all black women. The results of this study clearly show that the majority of previously identified barriers do not apply to this study population.

Structural Factors

In the next set of models, I will examine structural factors and their effect on prenatal care compliance. These models include financial strain, private insurance, stigma, and control variables. Model 2 includes financial strain, private insurance, and stigma. The results show that there are no significant associations between structural factors and prenatal care compliance. The results do not lend support to Hypotheses H11-H13. For this group of women, the structural conditions are almost the same with little variation. Almost all the women suffer from financial strain, are on Medicaid, and having been stigmatized; faced some criticism about their lifestyle and the number of pregnancies that they have had from healthcare providers.

Agency and Structural Factors

Model 3 combines both agency and structural factors in a single model. Only church support is significant in this model. Net of structural factors, Church social support remains significant (b= .116). This result shows that for every one standard deviation increase in church social support women are .116 more complaint with prenatal care guidelines. These results continue to support Hypothesis H10. The pseudo R^2 in this model is relatively low (.003). This indicates that only 0.3% of the variances in late prenatal care utilization are explained by combined agency and structural factors.

Agency Factors, Structure Factors and Risk Health Behavior

Model 4 presents estimates from OLS regression on prenatal care compliance examining the effects of agency and structural factors, controls, and risk health behavior. None of the variables reach significance in this model. Church social support (b= .106) loses its significance when agency, control, and risk health behavior are added to the model. The introduction of the control variables and risk health behaviors have added to much noise to the model and thus, church support is no longer significant.

Parsimonious Model

In Model 5, I created a parsimonious model consisting of significant predictors of prenatal care compliance across Models 1-4. This model consists only of church social support (b=.128). The results show that a one standard deviation increase in church social support increases prenatal care compliance by .128. These results continue to support Hypotheses H10.

The pseudo R^2 in this model is relatively low (.016). This indicates that only 1.6% of the variances in late prenatal care utilization are explained by church social support.

In comparing model fit for Model 1 and Model 5, I found that the -2LLog likelihood decreased across models by 2.722 on three degrees of freedom which shows that there is significant improvement in the parsimonious model (Model 5). In comparing the models, Model 5 is the best model in predicting prenatal care compliance.

Table 5.2 Estimates of Prenatal Care Compliance Regressed on Agency and Structure Factors and Health Risk Behavior Based on OLS Regression (N=331)

Prenatal Care Compliance					
	Model 1	Model 2	Model 3	Model 4	Model 5
	b (S.E.)	b (S.E.)	b (S.E.)	b (S.E.)	b (S.E.)
Agency Factors					
Family Size	.087 (.058)		.086 (.063)	.086 (.066)	
Knowledge/Attitude	-.024 (.061)		-.016 (.062)	-.037(.068)	
Church Support	.124* (.061)		.116* (.060)	.106^{+} (.061)	.128* (.058)
Neighborhood Support	.003 (.059)		.000 (.060)	-.022 (.062)	
Structural Factors					
Financial Strain		.056 (.055)	.022 (.059)	.024 (.060)	
Private Insurance		-.019 (.056)	-.050 (.059)	-.086 (.063)	
Stigma		-.070 (.056)	-.048 (.062)	-.058 (.064)	
Control Variables					
Age				-.059 (.075)	
Single				.027 (.064)	
High School Graduate				-.100^{+} .060	
Risk Health Behavior					
Risk Health Behavior				.081 (.059)	
Constant (Intercept)	7.607	2.836	8.966	15.723	4.885*
R^2	.025	.009	.030	.053	.016

$^{+}$ p <.10 * p < .05 ** p < .01 *** p <.001 Key: O.R. – Unstandarized Coefficients (b) (S.E.)

Discussion

Family Size

The results show that family size is a significant predictor of late prenatal care utilization. These findings support previous research that found that the majority of low income black women living in urban areas tend to have large family units. Large family sizes consist of two or more children, extended family members that include grandmothers, aunts and uncles, cousins and sometimes friends. However, the one thing that is often missing from these large family units is the father of the unborn child (Ruggles, 1994; Lane, 2003; Levy & Sidel, 2006; IOM, 1988; IOM, 2007; Braveman, 2000). Low income black women in large family units are less likely to utilize prenatal care if they are in households where they are surrounded by extended family members (Olds et al, 1986). This is an interesting finding because in other racial or ethnic groups, such as Hispanics, large family units provide support, childcare, and other forms of support to increase the use of prenatal care services (Moss & Hensleigh, 1990; Collins et al, 1993; Harley & Eskenazi, 2006; Martinez-Schallmoser et al, 2006). However, in this study population a large portion of the family unit consist of children.

Black women who are unmarried oftentimes lives with their mothers. The mothers in most cases do not provide additional support. The addition of mothers, aunts, and other authority figures bring about conflict instead of support. If the unborn child's father is also living in the home, there is additional conflict. This additional conflict brings on another level of maternal stress in an already stressful situation (Cole et al, 1998; Olds et al, 1986; Braitwaite et al, 2010; IOM, 2007; Lane, 2003). This stressful home environment can lead to late or no prenatal care use and possibly adverse birth outcomes.

Based on previous experiences, grandmothers, aunts, and other older women living in the household may discourage younger women from seeking prenatal care. This could be for two reasons. One reason is that the older women may have had bad experiences at the local clinic or health center where they received prenatal care services. Another reason could be that they have previous experience giving birth to babies and feel that they have all the knowledge need to aid the young mother in give birth to a healthy baby.

As mentioned earlier, a large number of the family unit are children. These children require care and support leaving the mother little time to seek prenatal care services. These additional children also add maternal stress, financial strain, and other barriers that inhibit the use of early prenatal care. Women with additional children, who have not reached the age to attend school, are in need of childcare and cannot afford it. The lack of childcare services limits a woman's ability to seek prenatal care services early and remain compliant throughout the pregnancy.

Knowledge/Attitudes

Knowledge/attitude about pregnancy and prenatal care was also significant in predicating late prenatal care utilization. Women with more knowledge about signs and symptoms of pregnancy and positive attitudes about being pregnant and seeking prenatal care are less likely to seek late prenatal care. As mentioned previously, this could be because multiparious women often feel that they know all there is to know about prenatal care from their past experience (Hong & Ruiz-Beltran, 2007; Bhutta et al, 2005). Knowledge is a significant factor in determining the prenatal care use on both ends of the spectrum of both late and early prenatal care use.

Studies have shown that younger women (18-25) have limited knowledge about the signs and symptoms of pregnancy. For those that know they are pregnant and do not know how, when and where to seek prenatal care services (Hogue et al, 2007; Daniels et al, 2006; Lane, 2003; IOM, 2007). This younger group of women also experiences feelings of denial or pregnancy unwantedness that inhibit them from seeking early prenatal care. Younger women often time contemplate abortions, or participate in risky health behavior in hopes of losing the baby (Daniels et al, 2006; Lane, 2003; Riley et al, 2003; LeVeist, 2005).

In some cases, black women who received early prenatal care and were complaint with all recommended services also experienced adverse outcomes. Their experiences lead to anger and distrust of the doctors and other healthcare providers. This distrust leads to late or no prenatal care for additional pregnancies (Braitewaite et al, 2006; Daniels et al, 2006; Lane, 2003).

Church Social Support

When examining the predictors of prenatal care compliance, church social support was the only significant predictor of prenatal care compliance. Women who had increased social support from the church were more likely to attend all their prenatal care visits, eat health, gain limited amounts of weight, and take their nutritional supplements. This is not surprising as government entities have started to use the black church and other faith based organizations to improve health outcomes, education, and other social issues that plague our society.

Traditionally, the black church has been the foundation of the black community. Sociologists, such as Cornel West, and other black leaders from all disciplines, used the black church to launch the “State of Black America Initiative.” This initiative uses the black church as

the meeting place and platform to disseminate information of healthcare and other social issues across the country. Because religious leaders, such as Martin Luther King, Jr., and others have often been the voice of the black community, using the church to education the black community about healthcare issues has been shown to improve health outcomes such as adverse birth outcomes, diabetes, hypertension, and cardiovascular disease (Mayberry et al, 2003; Orr, 2004; Cristales, 2009).

In addition, the black church offers support systems through health ministries, prayer groups, and other forms of support to reduce the stressful issues of pregnancy. These services provides free or reduced daycare services, financial assistance for medication and other health services, transportation, and individual counseling sessions and emotional support groups. All these issues have been previously identified as barriers to prenatal care and prenatal care compliance (Daniels et al, 2006; Houge et al, 2007; Lane, 2003; Orr, 2004).

Although the results of this analysis did not support the majority of the postulated hypotheses, there are some significant findings. Agency factors, family size and knowledge/attitude are direct predicators of late prenatal care utilization and church social support is a direct predictor of prenatal care compliance. In this analysis, structural factors did not play a role in predicting timing of prenatal care utilization nor prenatal care compliance. These limited findings can possibly be explained by the limited variation among this within group study population of low income black women in the South.

CHAPTER 6

FACTORS AFFECTING BIRTH OUTCOMES: PRETERM BIRTHS AND LOW BIRTH WEIGHT

In this chapter, I will analyze factors that affect birth outcomes; preterm births and infants born with low birth weight, among black women in the South. In the first half of the chapter, I will regress agency factors (neighborhood social support, church social support, family size, and knowledge/attitude), structural factors (financial strain, stigma, and private insurance), control variables (age, currently single (marital status), and education), risk health behavior, timing of prenatal care utilization and prenatal care compliance on the dependent variable preterm birth. In the second half of the chapter, I will examine these same factors using low birth weight as the dependent variable.

Examining birth outcomes among the study population is extremely important because infant mortality rates are used as the health indicator of a nation (NVS, 2009). The primary and secondary reasons for infant mortality are preterm births and low birth weight respectively. The literature is bombarded with studies that compare the black-white gap for birth outcomes, but very little research has examined birth outcomes within low income, African Americans. I expect to find that lack of compliance with prenatal care will be associated with adverse birth outcomes, as well as, all identified maternal stressors, risk health behavior, and prenatal care compliance will play role in predicting birth outcomes.

Analysis and Findings

Preterm Births

Table 6.1 presents estimates from logistic regression analysis examining preterm births versus termed births regressed on factors representing agency factors such as church and neighborhood social support, family size, and knowledge/attitudes about pregnancy and prenatal care and prenatal care compliance. Although none of the variables reached significance for preterm birth, the models are shown at the end of the chapter to show that the model strategy for both preterm birth and low birth weight were the same.

Prenatal Care Compliance

In Model 1, I add prenatal care compliance because it has been shown to reduce adverse birth outcomes such as preterm birth and low birth weight (Gonzalez-Calvo et al, 1998; Conde-Agudelo et al, 2006; Guillory et al, 2003). Since the bivariate analyses show very weak associations between prenatal care timing and compliance with the adverse birth outcomes, timing was left out and only compliance was tested. However in this analysis, the results show no relationship between prenatal care compliance and preterm births.

Perhaps this can be explained by multiple factors including time of prenatal care utilization. Prenatal care compliance depends a timing of prenatal care utilization. Women who have planned pregnancies often time seek early prenatal care and receive all recommended services before delivery. Among this study population, there was little variation in the percentage of women who delivered preterm births. Over 72% of this study population delivered babies prematurely.

Agency Factors, Structural Factors, Risk Health Behavior

In Model 2, social support (church and neighborhood), family size and knowledge/attitude are added to the model however none are significantly associated with preterm delivery. The pseudo R^2 in this model is extremely low (.020). In Model 3, none of the structural variables are significant either. The pseudo R^2 in this model is extremely low (.020). In the remaining models, when adding controls and risk health behavior, again, no variables are significantly associated with preterm births. A parsimonious model was not created in this set of models because none of the variables reached significance.

For preterm births, none of the postulated hypotheses were supported by this analysis. Also, model fit was not examined due to the lack of significance across all models. These results show that although the agency barriers, structural barriers, and risk health behavior that were introduced in these models have been show to predict preterm births among different racial groups; it does not explain preterm births when examining within group differences.

Table 6.1 Estimates of Preterm Births Regressed on Agency and Structure Factors, Risk Health Behavior, and Prenatal Care Compliance Based on Logistic Regression (N=331)

Preterm Births					
	Model 1	Model 2	Model 3	Model 4	Model 5
	O.R. (CI)	O.R. (CI)	O.R. (CI)	O.R. (CI)	O.R. (CI)
Prenatal Care Compliance	1.281 (.973- 1.686)	1.296 (.980- 1.713)	1.277 (.974- 1.675)	1.289 (.972- 1.708)	1.296 (.978- 1.719)
Agency Factors					
Family Size		1.031 (.797- 1.335)		1.050 (.795- 1.388)	1.059 (.800- 1.402)
Knowledge/Attitude		1.063 (.822- 1.375)		1.105 (.832- 1.467)	1.106 (.832- 1.469)
Church Support		1.081 (.846- 1.382)		1.069 (.828- 1.379)	1.066 (.825- 1.375)
Neighborhood Support		1.092 (.846- 1.409)		1.113 (.853- 1.452)	1.116 (.855- 1.457)
Structural Factors					
Financial Strain			.961 (.751- 1.230)	.925 (.716- 1.193)	.928 (.718- 1.198)
Private Insurance			.897 (.690- 1.165)	.851 (.639- 1.132)	.856 (.642- 1.140)
Stigma			1.071 (.840- 1.364)	1.046 (.807- 1.357)	1.042 (.803- 1.352)
Control Variables					
Age				1.037 (.757- 1.420)	1.029 (.751- 1.410)
Single				.928 (.707- 1.218)	.930 (.709- 1.221)
High School Graduate				.898 (.698- 1.155)	.896 (.696- 1.153)
Risk Health behavior					
Risk Health Behavior					.922 (.722- 1.176)
Constant (Intercept)	2.704***	2.711***	2.714***	2.736***	2.741***
R^2	.015	.020	.020	.033	.035
-2 Log likelihood	374.943	373.761	382.230	370.890	370.469

$^{+}$ p <.10 * p < .05 ** p < .01 *** p <.001 Key: O.R. - Odds Ratio (Confidence Interval (CI))

Low Birth Weight

Table 6.2 presents estimates from logistic regression analysis examining low birth weight (<2500 grams) versus normal birth weight (≥ 2500 grams) regressed on factors representing agency factors such as social support, family size, and knowledge/attitudes about pregnancy and prenatal care, and prenatal care compliance on the dependent variable low birth weight.

Prenatal Care Compliance

In Model 1, I add prenatal care compliance because of previous association because on previous research in the literature discussed earlier. In this model prenatal care compliance does not reach significance. The pseudo R^2 in this model is extremely low (.010). This indicates that only 1.0% of the variances in predicting preterm births are explained by prenatal care compliance. Perhaps the reasons can be explained by the same explanation given for preterm births.

Agency Factors

In Model 2, social support (neighborhood and church), family size and knowledge/attitude are all associated with low birth weight however none reach significance. The pseudo R^2 in this model is extremely low (.028). This indicates that only 2.8% of the variances in predicting low birth weight are explained by social support, family size, and knowledge/attitudes.

Hypothesis 22 was not supported by the results in Table 6.2. These results do not support previous literature that has shown that social support is influential in predicting low birth weight

(Hogue et al, 2007; Rowley et al, 2007). Hypothesis 23 was not supported by the results. In examining the ability to predict low birth weight, the results show that family size does not significantly predicts low birth weight.

Hypothesis 24 was also not supported by the results. Knowledge/attitude does not have an influence on low birth weight. Once again these findings do not support previous research findings that women who are knowledgeable about signs and symptoms of pregnancy and prenatal care often seek early prenatal care which leads to positive birth outcomes.

Structural Factors

Model 3 provides the results of structural variables regressed on low birth weight. Once again, none of the structural variables reach significance. Financial strain was not significant in this model. The results do not lend support to Hypotheses 25. The ability to pay for healthcare services has been shown to have a direct effect on adverse birth outcomes but not among this study population. Private insurance does not support H26 in predicting low birth weight. Stigma does not have a significant effect on predicting preterm births. Although this is an identified barrier in the literature, the findings do not support Hypothesis 27. The pseudo R^2 in this model is extremely low (.027).

Agency Factors, Structural Factors, and Control Variables

In Model 4, I combined both agency and structural factors and add control variables (age, single, education). Once again prenatal care compliance and agency variables do not reach significance. However, private insurance is significantly associated with low birth weight. The results show that if a woman has private insurance the chance of delivering an infant born with

low birth weight is reduced by 25.2%. Previous research has shown that women with private insurance have better birth outcomes when it comes to low birth weight than women with no insurance or Medicaid (Schwartz, 1990; Vhor et al, 2002; Joyce et al, 2005). The pseudo R^2 in this model is extremely low (.055). I do not compare model fit across Models 2 and 3 to Model 4 because there are no significant variables for agency and structural factors in those models.

Agency Factors, Structural Factors, Risk Health Behavior

In Model 5, I add risk health behavior. Private insurance remains significant across Models 4 and 5. No other variables in this model reach significance. The pseudo R^2 in this model remains extremely low (.057). I also compare model fit across Models 4 and 5.
In comparing Model 4 to Model 5, the -2LLog likelihood decreases across models by 0.6 on one degree of freedom which shows that there is no significant improvement of model fit for Model 5 in comparison to Model 4.

Parsimonious Model

In Model 6, I created a parsimonious model consisting of significant predictors of low birth weight across Models 1-5. This model consists of only private insurance. The results show that alone private insurance loses its significance. Perhaps this loss of significance can be explained by the suppression effect brought on one of the agency factors. The pseudo R^2 in this model is relatively low (.015). This indicates that only 1.5% of the variances in low birth weight are explained by private insurance. In comparing Model 6 to Model 4, the -2LLog likelihood decreases across models by 17.851 on ten degree of freedom which shows that there is significant improvement of model fit for Model 4 in comparison to Model 6.

Table 6.2 Estimates of Low Birth Weight Regressed on Agency and Structure Factors, Risk Health Behavior, and Prenatal Care Compliance Based on Logistic Regression (N=331)

	Low Birth Weight					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	O.R. (CI)	O.R. (CI)	O.R. (CI)	O.R. (CI)	O.R. (CI)	
Prenatal Care Compliance	1.212 (.946- 1.554)	1.225 (.952- 1.577)	1.200 (.937- 1.536)	1.228 (.951- 1.587)	1.236 (.956- 1.597)	
Agency Factors						
Family Size		1.030 (.807- 1.314)		1.085 (.833- 1.413)	1.094 (.839- 1.428)	
Knowledge/Attitude		1.072 (.841- 1.366)		1.058 (.809- 1.384)	1.059 (.810- 1.385)	
Church Support		.962 (.760- 1.218)		.928 (.726- 1.186)	.924 (.723- 1.182)	
Neighborhood Support		1.259 (.985- 1.609)		1.256 (.972- 1.624)	1.262 (.975- 1.633)	
Structural Factors						
Financial Strain			1.091 (.869- 1.369)	1.072 (.847- 1.358)	1.077 (.850- 1.364)	
Private Insurance			.795 (.613- 1.030)	.748* (.563- .994)	.753* (.566- .997)	.788 (.609- .1.019)
Stigma			1.048 (.833- 1.320)	1.055 (.823- 1.351)	1.050 (.819- 1.345)	
Control Variables						
Age				.909 (.679- 1.216)	.901 (.673- 1.207)	
Single				.996 (.774- 1.281)	.999 (.776- 1.285)	
High School Graduate				1.046 (.815- 1.342)	1.044 (.813- 1.340)	
Risk Health behavior						
Risk Health Behavior					.911 (.721- 1.151)	
Constant (Intercept)	1.973***	1.987***	2.009***	2.021***	2.029***	1.994***
R^2	.010	.028	.027	.055	.057	.015
-2 Log likelihood	410.557	406.405	414.938	400.010	399.410	417.861

$^{+}$ p <.10 * p < .05 ** p < .01 *** p <.001 Key: O.R. - Odds Ratio (Confidence Interval (CI))

Discussion

My original hypotheses regarding agency factors, structural factors, and risk health behavior , and prenatal care compliance on adverse birth outcomes preterm births and low birth weight was not generally supported. Only private insurance was a significant predictor of low birth weight. These results support previous research that shows that women who have private insurance less are likely to deliver infants with low birth weight.

Private Insurance

The results of this study found that women who had private insurance were less likely to deliver babies with low birth weight. This is surprising as I thought that the same results would be found for preterm births but the results were different. Studies have shown that having medical insurance during pregnancy and childbirth can affect the chances of adverse birth outcomes and even infant survival (Hogue, 2007; Orr, 2004; Blanche, 1999). Low birth weight is associated with infant morbidity and mortality. Infants whose deliveries are self pay are nearly twice as likely to die as those whose deliveries were paid by Medicaid and over three times as likely to die as those whose deliveries were covered by private insurance. Babies covered by Medicaid were more than 60 percent more likely to die than those paid by private insurance (Alabama Dept of Health, 2009).

In addition, women who do not have private health insurance also tend to live in neighborhoods that have limited access to foods with high nutritional value. In a population where obesity rates have risen substantially, obese pregnant women have a higher rate for adverse pregnancy outcomes (Beaten et al, 2001). The higher a woman's BMI the greater the risk for premature deliver which can lead to low birth weight.

These outcome differences reflect the different socioeconomic and cultural risk factors of mothers as well as the amount and quality of health services received by mothers with different methods of payment for delivery. Finding ways to increase the number of women with insurance should greatly reduce the number of mothers with late or no prenatal care and improve pregnancy outcomes by reducing the incidence of low birth weight babies and infant mortality. Identified factors which had a bearing on method of payment for delivery include level of education, maternal age and marital status (McDonald and Coburn, 1988).

Women who have private insurance are often married, older than 25, educated, and are employed full time. These women often have insurance through their job or their husband place of employment. These women have better birth outcomes than women who receive healthcare services for free or self pay. Although the results of this analysis does not link stigma to low birth weight among this study population, studies have shown that stigma inhibits a woman from seeking early prenatal care services and can lead to adverse birth outcomes (Daniels et al, 2006; Stout, 1997; Lang & Iams, 2009; Lu & Halfon, 2003; Luo et al, 2006). With the passing of the health care reform bill, it will be interesting to reevaluate this study population in a few years to see if insurance will reduce the adverse birth outcomes in this population.

Perhaps the most significant finding for both preterm births and low birth weight was not related to specific hypotheses or based on statistical significance at all but the overall assumption that both these adverse birth outcomes are influenced by agency factors, structural factors, and risk health behavior within low income black women in the South. The R^2 values for all models in Tables 6.1 and 6.2 were relatively low with the high value being .057 (Table 6.2 Model 5). This means that almost 95% of the variance for preterm birth and low birth weight is not

explained by these variables which are a contradiction to previous research reported in the literature.

My original hypotheses regarding agency factors, structural factors, and risk health behavior on adverse birth outcomes preterm births and low birth weight was not generally supported. Only private insurance was a significant predictor of low birth weight. These results support previous research that shows that women who have private insurance are less likely to deliver infants with low birth weight. These limited findings can possibly be explained by the limited variation among this within group study population of low income black women in the South.

CHAPTER 7

SUMMARY AND CONCLUSIONS

Discussion

The ultimate goal of this study was to build models examining the effects of agency and structural factors that influence timing of prenatal care utilization, prenatal care compliance, and adverse birth outcomes (preterm births and low birth weight) for a sample of low-income Southern African American women. The nine months during a woman pregnancy is the most important time for a developing fetus. Timing of prenatal care utilization and prenatal care compliance have long been thought of as the primary defenses against pregnancy complications and adverse birth outcomes such as preterm births, low birth weight, and ultimately infant mortality (Alexander & Kotelchuck, 1995; Alexander &Cornely, 1987; Bell et al, 2006; Braveman et al, 2000; Braveman, 2005; Chandler, 2002; Daniels et al, 2006; Gazmararian et al, 1999; Goldhagen et al., 2005; IOM, 2005; Lane, 2005; Lu & Halfon, 2003). By placing both the agency and structural barriers into a sociological framework as well as a public health model, it is possible to describe the predictors that contribute to barriers to timing of prenatal care utilization and compliance and their affect on adverse birth outcomes among low income black women in the south.

Some primary criticism of previous research on identifying barriers to early use of prenatal care and compliance are that they only examine differences between racial groups and that they are mostly qualitative. Despite the advances in identifying barriers to prenatal care utilization and compliance and their affect on birth outcomes, there has been little research done in examining those identified barriers within the population with the worse use, compliance, and adverse birth outcomes. By focusing on a within group study population, this study contributes

to our understanding of why low income black women receive late prenatal care, are not compliant, and have the highest rates of adverse birth outcomes.

Since the early 1980's, this area of study has been limited to the public health arena with limited, if any, theoretical structure. This study was undertaken utilizing two theoretical frameworks: intersectionality framework and the Health Belief Model. The intersectionality framework contents that there are many social factors that interact together to explain why certain issues exist for marginalized groups. For this study population, race, class, and gender are all interacting as a preexisting barrier that has an impact on both agency and structure factors. This intersection creates a "matrix of domination" that gives this group of women an unfair disadvantage in understanding, maneuvering, and surviving the healthcare system during a critical time in their lives. This within group study focus on low income black women and the agency barriers and structural barriers that they face on a day-to-day basis that may inhibit them from seeking early prenatal care, complying to recommendations of their physician, and delivering babies who are premature and underweight.

The Health Belief Model (underpinned by Rational Choice Theory) is also equally important in examining one's preferences and behaviors to examine the constraints and barriers that are based on performance and utility of healthcare associated with lack of resources, barriers and other structural constraints. The health belief model is crucial in examining how one's knowledge or desire to learn and how an individual's attitude is shaped toward a specific health issues. By testing these two frameworks through a series of hypotheses, it could provide further insight into how low income black women are influenced (or not) by agency and structural factors that can lead to late prenatal care utilization, non-compliance in the use of prenatal care services, and adverse birth outcomes.

Timing of Prenatal Care Utilization

These results have particular consequences for the intersectionality framework when examining barriers to timing of prenatal care utilization and compliance. If the assumption can be made that race, class, and gender are all intersecting as a preexisting barrier to this within group population and the estimated models are correct, then the results indicate a causal link between preexisting social factors and agency factors that have been identified in previous research. Low income black women who are a part of a large family unit, living in the south are more likely to seek late or no prenatal care and are less likely to adhere to recommendation of their doctor to seek prenatal care services throughout their pregnancy.

In examining family size, the results show that the larger the family size, the more likely it is that a woman will not seek out prenatal care in a timely fashion. These findings support previous research that found that women were more likely to underutilize prenatal care if they are embedded in strong-tie, non-disperse networks where most members were immediate family or relatives (Olds et. al, 1986). This is an interesting finding because additional family members could provide extra support in terms of child care for other children, financial support, and other factors that could increase a woman's ability to seek early prenatal care. However, this is not the case among this population because the large networks in this case consist of children.

This position finds support from previous research that shows that there is both support and conflict within large families that could inhibit early prenatal care use. And although there may be a large family unit that does not necessarily mean that these women have additional support. Single mothers in this study population live with their mothers. Studies have shown that there is more conflict between mothers and grandmothers creating a stressful childrearing environment than women who live with their husbands or boyfriends (Cole et al, 1998;

Furstenburg & Crawford, 1978; Olds, 1997; Robinson et al, 1997; Geeraert et al, 2004; Olds et al, 1999; Balaji et al, 2007). This stressful home environment can lead to late prenatal care use and possibly adverse birth outcomes.

Another possible reason for this finding is that these women have additional children that need to be cared for. Additional children add additional layers of stress on an oftentimes single mother with many other responsibilities. These mothers often cannot afford childcare and often have to take their children with them wherever they go. This includes going to the doctor for prenatal care visits. In addition to the prenatal care visits, women who have given birth more than once oftentimes feel like they do not need any additional prenatal care because of the knowledge they have gain from previous pregnancies. The long wait times that has been associated with inner-city healthcare facilities in impoverished neighborhoods, are not a place where a mother with several kids in tow wants to send her day. This leads to late or no prenatal care utilization because they do not have the time or resources to seek early continuous care.

Another reason for these results, are that women who live in large households often are the caregivers for others in living in their household. This group of women often lives with older parents and extended family that need constant healthcare due to the large incidence and prevalence rates of chronic disease such as diabetes, hypertension, cardiovascular disease, etc. This additional responsibility hinders early prenatal care utilization and possibly compliance.

Not only does the significance of this study have an impact on the intersectionality framework, the results also have implications for the Health Belief Model. Knowledge and attitudes are key factors that shape one's health beliefs. A woman's health beliefs are shaped by a number of factors. These factors can be either agency or structural factors and oftentimes both. In examining agency factors verses structural factors, the results show that agency factors such

as family size, social support and knowledge/attitudes have an effect on prenatal care use and compliance. These are all individual factors that affect each woman individually. Some may argue because they are individual factors that they can be easily changed. However, changing one's health beliefs and behavior is not something that is easily done or sustainable over time (LaVeist, 2005).

In addition to family size, knowledge/attitude also plays a role in predicting late prenatal care utilization. Women with more knowledge about signs and symptoms of pregnancy and positive attitudes about being pregnant and seeking prenatal care are more likely to seek early prenatal care. However, increased knowledge and positive attitudes were very limited among this group of women. Knowledge is a significant factor in determining the prenatal care use on both ends of the spectrum for both late and early prenatal care use.

In this study, women who were younger had limited knowledge about the signs and symptoms of pregnancy. This lack of knowledge led to late prenatal care utilization. The results infer that low income black women living in the south are directly impacted by the lack of knowledge and negative attitude about pregnancy and prenatal care. Women with more knowledge about signs and symptoms of pregnancy and positive attitudes about being pregnant and seeking prenatal care are more likely to seek early prenatal care. This late prenatal care use may also be explained by multiparious (women who have given birth more than once) mothers who have gone through the prenatal care process before. These women feel that they have all the knowledge needed from previous pregnancies to delivery healthy babies without seeking medical care (Daniels et al, 2006; Hugue et al, 2007; Rowley et al, 2004; Alexander & Korenbrot, 2002).

Attitudes about pregnancy and prenatal care also play a huge role in the timing of prenatal care. Women who have a desire to be pregnant and/or have a planned pregnancy are

more likely to seek early prenatal care. They are more knowledgeable because they have planned for their pregnancy. Women who do not plan or experience feelings of "pregnancy unwantedness" often do not seek early prenatal care. Based on previous qualitative research among this study population, women who did not want to be pregnant wished for adverse events to happen so they did not seek prenatal care. These adverse events included hoping that they baby would be born stillborn, have miscarriages, etc. (Daniels et al, 2006; Gazmararian et al, 1999; Goldhagen et al., 2005; IOM, 2005; Lane, 2005; Lu & Halfon, 2003).

For women who wanted their babies, they were upset with the health care system because after receiving early prenatal care for previous pregnancies, they had experienced babies being born with disabilities and felt as if prenatal care no longer served a purpose for them. The literature shows that women who have had adverse birth outcomes after seeking early prenatal care and have received all the services tend not to seek prenatal care services for additional pregnancies (Hogue, 2007).

The attitudes of this population are also heavily influenced by tradition, culture, and extended family households (LeVeist, 2005; Braithwaite et al, 2010). This is a population that has been deeply rooted and influenced by slavery, racial discrimination and other historical events that has been past down from generation to generation. This distrust of the healthcare system has a major impact on whether or not women will seek prenatal care or any other type of care unless it is emergency care (LeVeist, 2005; Braithwaite et al, 2010).

Prenatal Care Compliance

While agency was predictive of prenatal care utilization, structural support (agency factor in this study because it is a personal choice) was associated with prenatal care compliance. The

analysis of prenatal care compliance revealed a significant association with church social support. This association can be explained by the strong connection that black people have to the black church. The black church has always been the voice of the black community. The black church has served as an agent for social welfare and leaders in community medicine and health (Wilson, 1978; West, 1999). Through health ministries, support groups, community outreach, and faith-based initiatives, the black church has become a new vehicle to improve health outcomes.

The results of this study show that church social support is instrumental in predicting and improving prenatal care compliance. Although women may not put much faith in health care providers, they do put a lot of faith in the advice of their pastors and church elders. It is this faith that aids in shaping their health beliefs. Because of this, there has been a massive push to improve the health of the black community using the black church to lead the movement. Researchers and activists, from many disciplines, have come together to examine the structural and social factors that lead to poor health including late prenatal care, compliance and adverse birth outcomes.

The black church is also influential is shaping attitudes about politics, social issues, and healthcare. Women who had increased social support from the church were more likely to attend all their prenatal care visits, eat healthy, gain limited amounts of weight, and take their nutritional supplements. This is not surprising as government entities, such as the President's Faith Based Initiative, were created to use faith based organizations to improve healthcare, education, and other social issues that plague society.

Based on tradition, the black community often times turns to the church for support and guidance. Many churches have developed health ministry's that focus on improving healthcare

among the members of their church. Religious leaders have traditionally been the voice of the black community. If the church says it, then it must be true no matter what my own beliefs may be. New studies are examining the role of the pastor's wife or “First Lady” (term coined by the African American church) as a significant and visible figure, as co-pastor and community advocate. In 2008-2009, knowledge of the intricate role of the First Lady in the black church prompted Healthy Mothers, Healthy Babies-Healthy Start to collaborate with a group of First Ladies to reduce infant mortality and improve birth outcomes (Cristales, 2009). This initiative has been able to educate the faith community on various maternal and child health topics while supporting these lessons with passages from the Bible thereby increasing their knowledge and shaping their attitudes (Cristales, 2009).

In addition, the church offers support in dealing with life events that may cause stress that limits a woman’s ability to be compliant when seeking prenatal care. These services may include, coping classes for women who are single and pregnant, financial assistance to help cover monthly bills or emergency situation, and offer day care services at reduced prices for women who have additional children.

If we go back to the work of Durkheim, in the 1800s, we find discussions on how social integration and how it promotes health, where as social isolation is harmful to one’s health (Ellis, 2006; Eriksson, 2010; Kusher & Sterk, 2005; Durkheim, 1951). The church offers a place to fellowship and seeks solace from the stressors of society. The church has always been a place of support and help to the black community. Women who attend church regularly often feel less stressed than women who do not (Orr, 2004). The results of this study provide a link between church social support and prenatal care compliance and can be used as a stepping stone in examining stress and its effect of prenatal care compliance.

Adverse Birth Outcomes

Preterm Birth

In examining predictors of preterm birth, the results infer that neither agency nor structural barriers are predictors among this study population of low income black women. Perhaps this can be explained by the lack of variation among this study population. This within group study had a high percentage of women who delivered babies prematurely (72.8%). Although this study did not support any of the hypotheses about agency and structural factors predicting preterm birth, it is important in that it examined other issues that go beyond the "typical" route of exploration. Previous perinatal research has oftentimes focused on racial disparities, even though no known or postulated genetic or physiological factors linked to skin color have been identified that increase risk for preterm birth. Furthermore, racial groups in the United States tend to contain a highly heterogeneous mix of genetic traits (Krieger et al, 1993) which suggests that socioeconomic, environmental, and behavioral factors underlie racial disparities.

Studies that have examined racial differences in preterm birth and other adverse birth outcomes often have focused on differences in income, education, health behaviors, and access to prenatal care as possible explanatory mechanisms (Adams et al, 1993; Collins et al, 1997; Collins et al, 1993; Kleinman et al, 1987; Mangold et al, 1991; McGrady et al, 1992; Rich-Edwards et al, 2001; Shiono et al, 1986; Shiono et al, 1986b). However, these models have not completely explained the higher risk experienced by African Americans. These studies show that although different barriers an facilitators have been identified in examining the black-white gap in timing of prenatal care and compliance and birth outcomes that these findings do not explain the within group differences among this study population. This study shows that previous findings are not

“a one size fit all” and that there are other factors that intersecting that affect this population of black women of low socioeconomic status in the South.

Low Birth Weight

In addition to timing of prenatal care utilization and compliance, the results for predictors of low birth weight can also have consequences for intersectionality framework. The results show that women who have private insurance are more likely to deliver babies of a healthy birth weight. If the assumptions can be made that women who are well educated, live in suburban neighborhoods (instead of the inner city), and have job stability, then the results indicate a link between private health insurance and low birth weight. This could be because women with private insurance have better access to quality healthcare than women who do not. Oftentimes women who can afford private insurance have better living conditions, more educational attainment and better job satiability. This is timely information with the passing of the new health reforms that that will hopefully provide access to health insurance to patients who would not normally be able to afford healthcare. The exploration of the effect of private insurance on birth outcomes should be reexamined in a few years to see if private insurance has actual improved birth outcomes.

This low income group of black women living in the south oftentimes does not have access to quality education, choices for living conditions, and job stability. For this group of women, studies have shown that low birth weight has been linked to poor nutritional habits including not taking prenatal care vitamins, limited access to prenatal care services, risky health behavior such as alcohol use or smoking, late prenatal care, and noncompliance to recommended prenatal care services (Collins et al, 2004; HRSA, 2005; Goldenberg et al, 2007; Borders et al,

2007; Reichman, 2005; Bada et al, 2005). All which are constant issues in the everyday lives of the study population.

The results of this study do not fully support the newly developed model fully, but it does provide a stepping stone for examining many factors that act separately and together to create conditions that are not optimal for early prenatal care utilization, prenatal care compliance, and improved birth outcomes. Within this population, these agency and structural factors are constant and problematic and therefore do not all predict timing of prenatal care, compliance or birth outcomes. The findings of this study can also provide a foundation for further exploring pre-identified barriers quantitatively and not just qualitatively.

Study Limitations

A major limitation of this study was not examining stress as a predictor of timing of prenatal care utilization, prenatal care compliance and adverse birth outcomes. Stress levels were not evaluated on the administrative forms or the cross-sectional survey. The stress levels of this study population of low income black women in the South can be attributed to financial barriers, family issues, neighborhood barriers, health issues, etc. High levels of stress have been linked to late or no prenatal care utilization, lack of compliance, and adverse birth outcomes (LaVeist, 2005; Braveman, 2005; Williams et al, 2008; Lu Halfon, 2003). Not measuring stress among this within group leaves out a major barrier previously identified in the literature.

Another limitation of the study is the data sources utilized. It is a small nonrandomized sample size (n= 331) of self reported data on the cross sectional questionnaire from women who only received prenatal care. As stated earlier, this limited variation in the sample could explain the limited findings in this study.

In addition, the lack of a control group in this study is a major study limitation. By not having a control group in this study, there is no way to eliminate alternate explanations of the study results. Since the majority of the women in this study received late prenatal care and was non-compliant in receiving all recommended prenatal care services, a possible control group would be women who received early prenatal care and all recommended services within the same geographical location and same socioeconomic status as the study population.

Although there are several limitations, this study offers many opportunities for sociologists, public health professions and clinicians to gain increased understanding of why low income black women may seek late prenatal care, may not comply with prenatal care recommendations, and have increased adverse birth outcomes. Possible suggestions for future research in this area are described later in the chapter.

Study Strengths

Regression modeling on the independent effects of agency factors, structural factors, risk health behavior, on the likelihood of prenatal care utilization and compliance and on adverse birth outcomes contributes to a better understanding of the determinants of health disparities among this study population. Most studies surrounding prenatal care use, compliance, and birth outcomes have been limited to comparing racial groups. Now that we know that there is clearly a difference between racial groups based on previous research, this study examines within-group differences. This within-group design explores the diversity of perceptions, experiences, and attitudes among black woman on issues surrounding prenatal care use, compliance, and birth outcomes. These results show that the relationships between agency and structural factors are not homogeneous and require more specificity in investigation. None of the identified studies

researching community levels of prenatal care use and birth outcomes have utilized this approach.

This research expands upon existing studies of the association between family size, social support, knowledge/attitude, and private insurance on prenatal care use and compliance and birth outcomes. Studies previously investigated racial differences for prenatal care use and birth outcomes but little investigation has been done to examine prenatal care compliance. Prenatal care compliance, as a whole, is virtually unexplored in its effects on birth outcomes.

This study also sheds light on the unique experience of pregnancy and perinatal outcomes among only low income black women living in the South. Study results indicate that only agency factors contributed to late prenatal care utilization and prenatal care compliance, while structural factors contribute to low birth weight. The findings infer that the effects of these factors are unique to the population studied.

Future Research

To rectify the study limitation in future research, I would make several changes. Although I would still do a within group study, I would examine variations between geographic locations (i.e. urban, suburban, rural), different age groups (18-25 vs 26-41), different income level or class levels, and examine women who have given birth for the first time vs women who have given birth multiple times, examine education levels (some school, high school graduate vs college graduate), marital status (although it is important to note that standard marital status categories may not apply to this study population) , family structure, and examine the level of stress by conducting a behavioral assessment to examine their affects on prenatal care utilization, compliance and adverse birth outcomes.

The health disparities that persist for the majority of health outcomes in the United States demonstrates the need for future investigation on prenatal care use, compliance and adverse birth outcomes among black women in the South. Because previous research findings, which usually focus on racial differences between black and white women, are not supported in this study, it is important that future research focus on within group examinations. Some things that may explain why this group of women seeks late prenatal care, do not comply with prenatal care recommendations, and have adverse birth outcomes may be linked to the mother's childhood environment and residential segregation.

Previous studies have shown that when comparing the birth outcomes of U.S. born black women sub-Saharan African- born blacks (purest racial ancestry), and U.S born whites, the study found that regardless of socioeconomic status, the U.S. born black women still had the worse birth outcomes (Davis & Collins, 1997). This provides evidence that there is something in the environment, whether it is childhood or adulthood (often time among this study population the environment remains the same) that has an effect on choices made during pregnancy and birth outcomes. It is important that this environment is examined to identify possible causes to prenatal care use and compliance and adverse birth outcomes.

Residential segregation is another possible factor that can be explored to examine timing of prenatal care utilization and compliance. The literature is full of studies that examined the association of residential segregation and infant mortality, preterm birth, and low birth weight. However, the effects of residential segregation and its effect on timing of prenatal care utilization and prenatal care compliance are almost nonexistent. Residential segregation can create environmental stressors that have not been clearly identified. These stressors can be both acute and chronic and can be linked to real-life experiences and perceptions (McLean et al, 1993).

Some of examples of these stressors are violent communities and perception of neighborhood. Since late prenatal care use and noncompliance has been linked to adverse birth outcomes, it is plausible that residential segregation could have an effect on late prenatal care utilization and lack of prenatal care compliance. This future research could provide answers as to why black women have increase adverse birth outcomes when all other indentified barriers are absent.

In addition, with the passing of the new health reform bills for universal healthcare, it will be important to evaluate if these adverse birth outcomes persist in the future. If private insurance is the key, then we should see a decrease in adverse birth outcomes and a decrease in infant mortality rates among this population and the United States as a whole.

Another area of interest would be to examine the effects of abortion on the timing of prenatal care utilization. Studies have shown that while women contemplate abortion if they do not seek an abortion the timing of prenatal care is late. Also during that contemplation phase, the women tend to wait too late and cannot have an abortion which can also lead to late prenatal care utilization. This contemplation is due to a number of issues such as pregnancy unwantedness, and denial. Although there is some stigma associated with abortions in the black community, there has not been enough research done to examine whether or not increased rates of abortions would lead to decreased rates of late prenatal care utilization.

Conclusion

The issues surrounding prenatal care utilization, prenatal care compliance, and birth outcomes among black women have been debated for decades. However, the web remains complex and confusing. Previously identified barriers and facilitators of prenatal care use and compliance still do not fully explain the health disparities between racial groups as well as within

them. In order to gain additional explanations for the determinants and pathways to prenatal care use and compliance and adverse birth outcomes, additional research is needed. Further studies are needed on within group populations to examine the association between social factors and health and how they intersect to affect health outcomes.

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APPENDIX

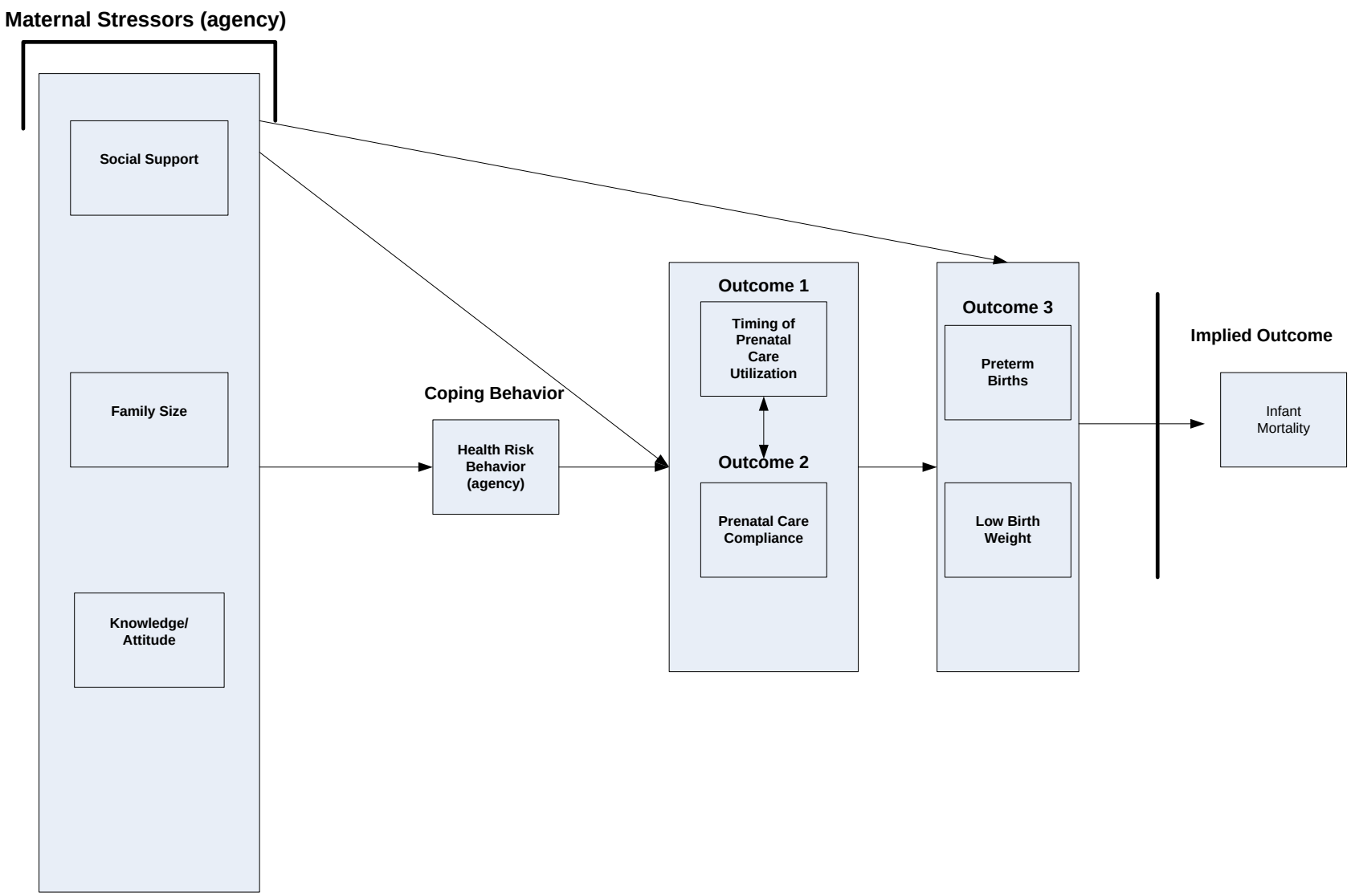

Figure A.1 Health Belief Conceptual Model: Agency Barriers to Prenatal Care Utilization and Adverse Birth Outcomes

The order in this model is random- there are no assumptions made by about structure or agency

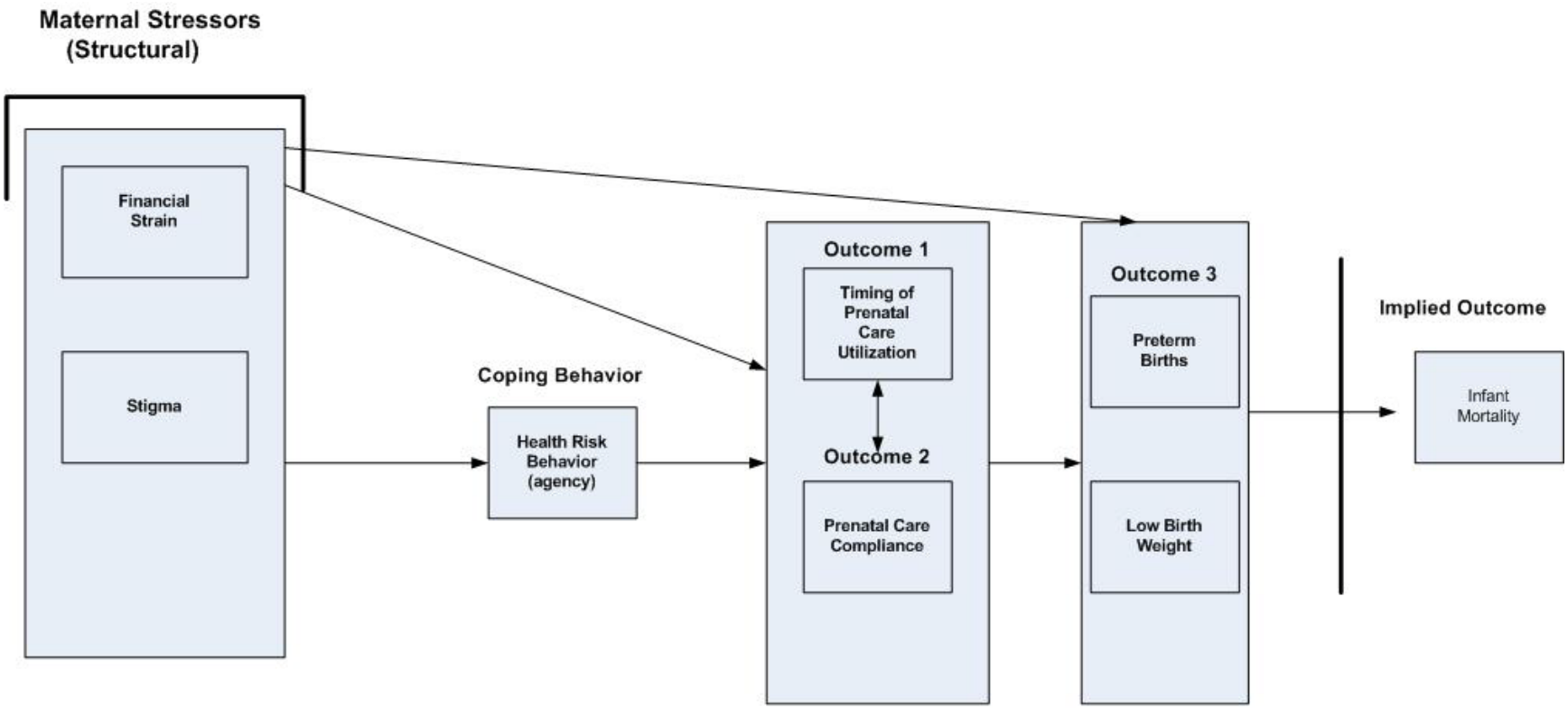

Figure A.2 Health Belief Conceptual Model: Structural Barriers to Prenatal Care Utilization and Adverse Birth Outcomes

The order in this model is random- there are no assumptions made by about structure or agency

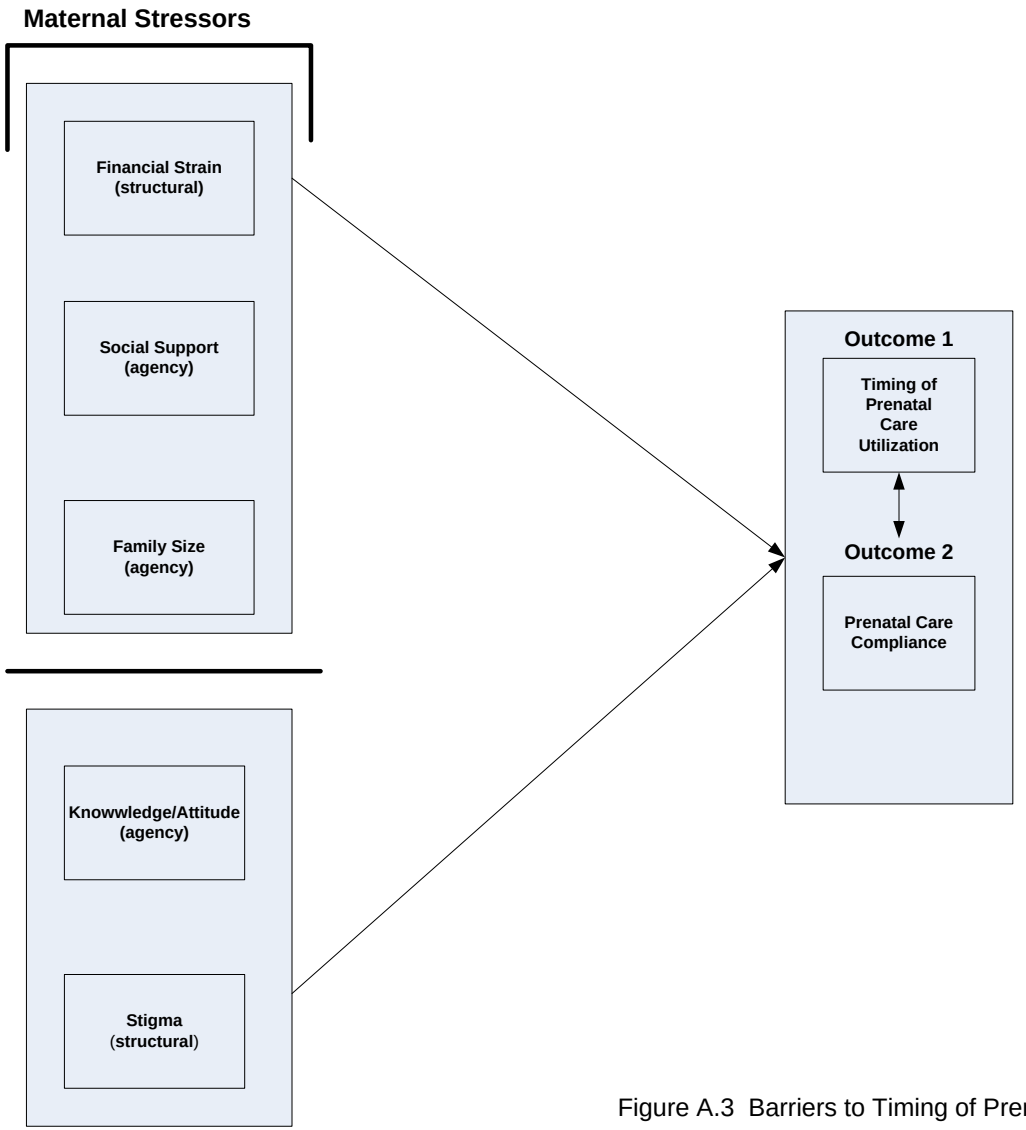

Figure A.3 Barriers to Timing of Prenatal Care Utilization

The order in this model is random- there are no assumptions made by about structure or agency

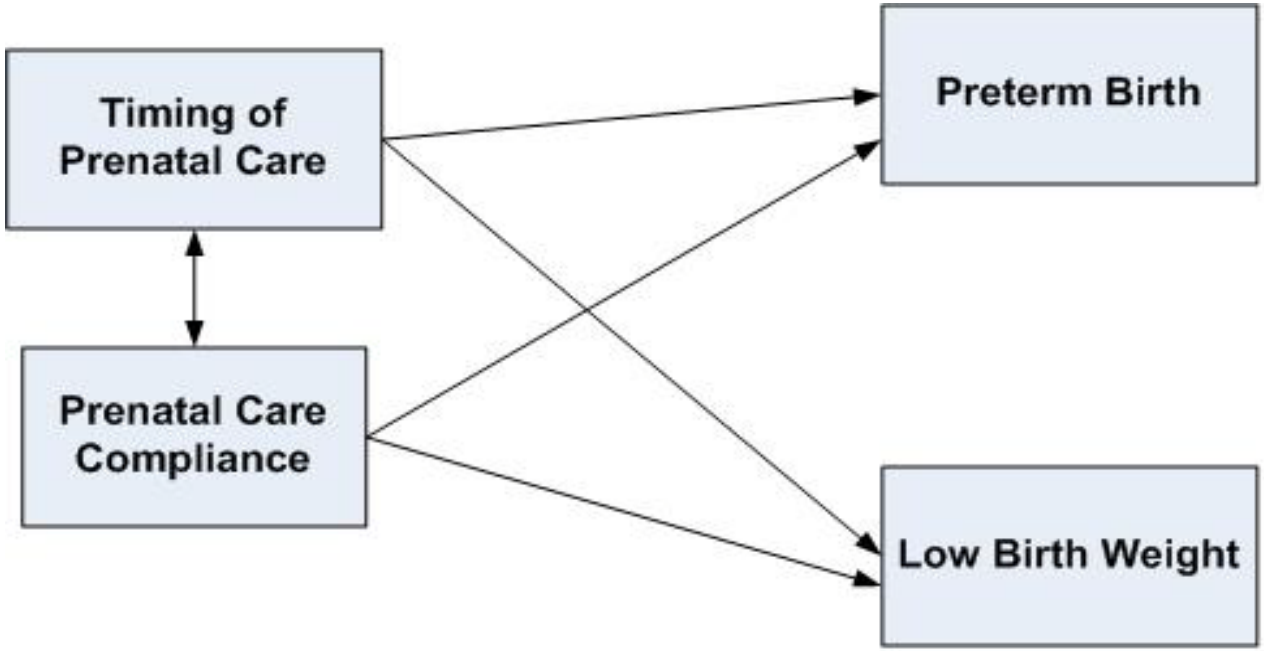

Figure A. 4 Timing of Prenatal Care and Its Effect on Birth Outcomes