The Resource Mothers Program: How Community Health Workers Can Reduce Low Birth Weight among African-American Clients in WIC Programs

DISSERVATION

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By

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* * * *

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Abstract

With a two-fold excess prevalence among African-American infants, low birth weight is arguably the most important contributor to the United States’ persistently large difference in infant mortality between African Americans and whites. The purpose of this research was to understand whether and how the Resource Mothers Program, a component of the Women, Infants, and Children (WIC) clinic at Southside Medical Center, influenced birth outcomes among low-income African-American women. The Resource Mothers Program implemented the following strategies to reduce low birth weight among its’ WIC clients: (1) improved access to and quality of prenatal care; (2) reduced prenatal smoking, drinking, and substance abuse; (3) prevented pregnancies among adolescent mothers and reduced pregnancies among women age 35 years and over; and (4) improved nutritional status. This research was conducted by investigating the differences between infants born to African-American women at two similar WIC clinics in Atlanta, Georgia, one with the Resource Mothers Program and the other without such a program. Both quantitative and qualitative research methods were utilized in this study.

Quantitative data for this study were obtained from the state of Georgia’s WIC Program, for fiscal years 1999 and 2000. Included in the data were 361 clients from Southside Medical Center’s WIC Program, and 152 clients from Grady Memorial
Hospital’s WIC Program. Results were also compared to data for all 49,558 WIC clients in the state of Georgia. Two types of data were used for the qualitative portion of the dissertation: (1) interviews with four resource mothers; and (2) interviews with 40 clients.

The qualitative data enhanced the study by providing information pertaining to the resource mothers, and their responsibilities in the clinic as well as their relationship with the clients, and by clarifying quantitative findings regarding the patients in both clinics. Overall, the analyses showed that in most categories the women at Southside (exposed to resource mothers) had lower rates of infants born with low (or very low) birth weight, than those at Grady (unexposed to resource mothers). After adjusting for age, marital status, family income, nutritional risk, alcohol use, cigarette use, and street drug use, the logistic regression analysis, found that mothers at Southside were one-third as likely as those at Grady to have a low birth weight baby (OR=.34; 95% CI = 0.16, 0.73). When excluding the education and alcohol variables from the model (because of substantial missing data for education, and because there were no alcohol users reported at Grady), clients of the Resource Mothers Program were still only half as likely to have a low birth weight baby (OR = 0.53, 95% CI = 0.30, 0.94). Of the potential mediating mechanisms, nutritional education and social support (informational, instrumental, emotional, and appraisal) were most important to the success of the Resource Mothers Program. According to the clients and resource mothers, the Resource Mothers Program was an asset to the WIC program. Both the clients and resource mothers benefited from the program.
Dedication

Dedicated to my mother
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CHAPTER 1

1. Introduction

1.1 Research Questions

This study aimed to investigate whether and how the Resource Mothers Program (a lay health advisor program) reduced low-birth weight among low-income African-American women. The study used both qualitative and quantitative research to answer seven research questions.

1. Does the Resource Mothers Program work?
2. Does the Resource Mothers Program increase access to care?
3. Does the Resource Mothers Program reduce tobacco use?
4. Does the Resource Mothers Program reduce alcohol use?
5. Does the Resource Mothers Program improve nutritional status?
6. Does the Resource Mothers Program provide social support?
7. Was the Resource Mothers Program effective for women at all ages?

These types of data collection were used for the qualitative portion of the dissertation: interviews with the resource mothers, interviews with their clients, observations of client-resource mother interactions at Southside, RAP sessions and staff meetings. The study examined the roles of the clinics and their effectiveness in improving low birth weight among infants born into the programs. The study also looked
at maternal behaviors and experiences that may influence birth outcomes before and during the pregnancy of women enrolled in the program.

1.2 Quantitative Research Hypotheses

Quantitative research hypotheses were designed for this study. This study was designed to test the following null hypotheses at the 0.05 level of significance between pregnant women who participated in the Southside Medical Center’s WIC Program where there was a Resource Mothers Program and the pregnant women who participated in the Grady Memorial Hospital’s WIC Program where there was no Resource Mothers Program. Data from the entire statewide database were used to examine the same questions with a larger population group. The variables that were used for this study were as follows: resource mothers, maternal age, maternal race, maternal income, family size, mother's marital status, mother's alcohol use, mother's cigarette use, mother's street drug use, mother’s education, mother’s migrant status, mother’s high risk status. Some of these variables were excluded from the final regression model because they were not actual confounders in the data set.

These quantitative research hypotheses were combined for fiscal years 1999 and 2000. The research hypotheses for this study were as follows:

1. There was no difference in the birth weight of infants born to mothers at Southside’s WIC clinic who were below the age of 20 years and those born to mothers at Grady Memorial’s WIC clinic who were below the age of 20 years.

2. There was no difference in the birth weight of infants born to mothers at Southside’s WIC clinic who were between the ages of 20 to 34 years and those
born to mothers at Grady Memorial’s WIC clinic who were between the ages of 20 to 34 years.

3. There was no difference in the birth weight of infants born to mothers at Southside’s WIC clinic who were 35 years or more and those born to mothers at Grady Memorial’s WIC clinic who were 35 years of more.

4. There was no difference in the birth weight of infants born to mothers who were baseline users of cigarettes versus those born to mothers who were non-users at the Southside and Grady Memorial WIC clinics.

5. There was no difference in the birth weight of infants born to mothers who were baseline users of street drugs versus those born to mothers who were non-users at the Southside and Grady Memorial WIC clinics.

6. There was no difference in the birth weight of infants born to mothers who were at high nutritional risk at baseline versus those born to mothers who were at normal risk at the Southside and Grady Memorial WIC clinics.

1.3 **Quantitative Analytic Strategy**

Logistic regression was used to perform the statistical analysis. The potential confounding of the association of “exposure to resource mothers” and “low-birth weight” was controlled by the following characteristics of the mothers: age, education, family income, family size, marital status, cigarette use, street drug use, and nutritional risk
status. The magnitude of the association between substance use, nutritional status, and low-birth weight was lower among Southside mothers.

1.4 Qualitative Data Analytic Strategy

The qualitative data consisted of in-depth interviews conducted with the resource mothers and clients in both WIC programs. Observations were made pertaining to the activities in the clinics, staff meetings with the resource mothers, client visits with the resource mothers, and the RAP sessions. These analyses clarify how the Resource Mothers Program was successful in helping to decrease low-birth weight among the pregnant women in the Southside Medical Center who utilize their services; and whether the program was instrumental in helping clients to continue their care at the facility. The interview guides for the resource mothers and the clients at Southside Medical Center can be found in the appendices (see Appendices, Tables A.2 and Table A.3).

Data analysis for the qualitative data was conducted by using EX-Text software. The analysis consisted of reducing the data, displaying the data, and drawing conclusions from the data. The intent was to determine what aspects of the program work well; what aspects of the program did not work well; to examine the role that the resource mothers played in the program, and to determine if the resource mothers had the same opinions towards the clients.

1.5 Description of the Dissertation

This dissertation consists of six chapters. Chapter one includes the introduction; chapter two includes the review of literature; chapter three includes the methodology; chapter four includes the quantitative results; chapter five includes the qualitative results
and chapter six includes the summary, conclusions and recommendations. The appendices and a bibliography are also included.

Chapter one, the introduction, consists of the problem statement, the research questions, the hypotheses, description of the dissertation, the need for the study, justifications regarding the need for the study, methods, and limitations of the study. Chapter two, the literature review, consists of a review of literature that describes the variables for the study, the theoretical framework for low-birth weight, risk factors utilized for the study, and prevention strategies. The methodology described in chapter three, gives details of the research design, the subject selection, the outcome measures and the data analysis. Chapter four, the results section, consists of the findings relative to the problem for the quantitative analysis, a description of missing data, a summary of the data, a summary of the analysis, tests of significance, and a summary. Chapter five, the qualitative analysis, consists of a summary of the analysis, citations from the resource mothers and clients, and a summary of the chapter. Lastly, chapter six discusses the implications of the study, conclusions, recommendations for practice, and future recommendations for research.

1.6 Need for the Study

Low-birth weight is the single most important factor affecting neonatal mortality, and is a determinant of postneonatal mortality. It accounts for half of all infant deaths and marked long-term morbidity for many of the survivors. Given that the improved survival of low-birth weight babies has chiefly been tied to expensive recent developments in perinatal medicine, health care dollars would be saved and later
complications would be prevented if fewer births resulted in low-birth weight (N.C.H.S., 1995).

Low-birth weight is a major concern for African-American infants. With a twofold excess prevalence among African-American infants, low-birth weight is arguably the most important contribution to the United States’ persistently large difference in infant mortality between African Americans and whites (Hogue and Yip, 1989). The vast majority of births under 1500 grams are associated with preterm delivery – the leading cause of death among African-American infants in the United States (Rauh, Andrews, and Garfinkel, 2001). Despite technological advances and improvements in science, black mothers at all ages are more likely than mothers of whites and other racial/ethnic groups to deliver low-birth weight (less than 2,500 grams) and very low-birth weight (less than 1,500 grams) babies. Why low-birth weight rates are highest for black infants is an unanswered question of intense public health interest (CDC, 1997).

The prevention of low-birth weight can yield marked reductions in perinatal morbidity and mortality, as well as reductions in developmental deficits and health problems later in childhood (N.C.H.S., 1995). Although there may be debate over the specific mechanisms, there is general consensus that the most effective means of reducing rates of low-birth weight, among African Americans, would include the following strategies: (1) improving access to and quality of prenatal care; (2) reducing prenatal smoking, drinking, and substance abuse; (3) preventing pregnancies among adolescent mothers and reducing pregnancies among women age 35 years and over; and
(4) improving nutritional status (N.C.H.S., 1995). In addition, providing social support is an overarching approach that relates to all these strategies.

1.7 Low-Birth Weight Trends

The annual incidence of low-birth weight (LBW) has raised from 6.8 per 100 live births in the mid-1980s, to 7.9 per 100 live births in 2003, a rise that has been linked in part to the increased multiple birth rates. The percent of LBW infants was unchanged from 1999 to 2000 at 7.6 percent. However, the percent of LBW infants rose from 7.8 percent in 2002 to 7.9 percent in 2003 (Hamilton, Martin, and Sutton, 2004). The percent of very-low-birth weight (VLBW) infants was 1.43 percent for 2000, essentially unchanged from 1999 (1.45 percent) (Martin, Hamilton, Ventura, Menacker, and Park, 2002). In 2002, the percent of VLBW infants was 1.5 percent; while the percent (1.4) decreased in 2003 (Hamilton, Martin, and Sutton, 2004).

These data, however, hide great variation across ethnic groups. This risk of LBW for Hispanic births is similar to that of non-Hispanic whites and about half that of black infants. Trends in Hispanic LBW have been comparatively stable. Overall LBW for births to Hispanic mothers rose moderately from 6.1 to 6.4 percent, and singleton LBW from 5.3 to 5.4 percent between 1990 and 2000. Among the Hispanic subgroups, LBW levels ranged from 6.0 percent for Mexican to 9.2 percent for Puerto Rican births between 1990 and 2000. For 2000, low-birth weight levels were unchanged from 1999 for non-Hispanic white births (6.6 percent), but declined slightly among black births (13.2 to 13.0 percent) (Martin, Hamilton, Ventura, Menacker, and Park, 2002). However, statistics show that the overall percent of VLBW black infants was down, from 3.14 to 3.07 percent for 1999-2000, the first decline in this rate since at least 1981. Despite this
encouraging trend, black mothers at all ages continue to be more likely than mothers of other racial/ethnic groups to deliver LBW or VLBW babies, (Martin, Hamilton, Ventura, Menacker, and Park, 2002).

1.8 Consequences of Low-Birth Weight Infants

The birth weight of an infant is the single most important determinant of its chances of survival, healthy growth and development. It is the single most important factor affecting neonatal mortality and is a determinant of post neonatal mortality (OMH, 1999). Advances in neonatal medicine have resulted in the increased survival of infants at lower birth weights (Hack, Klein, and Taylor, 1995). Because of these great advancements in medical technology to save the lives of many tiny infants at birth, there are serious questions regarding the development of these infants and whether they can live normal and productive lives.

Low-birth weight children are not a homogeneous group, but they have a broad spectrum of growth, health and developmental outcomes. While the vast majority of low-birth weight children have normal outcomes, as a group they generally have higher rates of subnormal growth, illnesses, and neuro-developmental problems. The lower a child’s birth weight, the more likely these problems are to occur. With the exception of a small minority of low-birth weight children with mental retardation and/or cerebral palsy, the developmental sequelae for most low-birth weight infants include mild problems in cognition, attention, and neuro-motor functioning (Hack, Klein, and Taylor, 1995).

1.9 Cost of Low-Birth Weight

The national costs associated with poor birth outcomes appear to be substantial. Direct medical expenditures for low-birth weight were estimated at between $15,000 and
A cost-effectiveness study of low-birth-weight infants using vital records and health statistics records estimated low-birth-weight costs at more than $38 million for one state (Gorsky and Colby, 1989). One study estimated the nationwide average cost of low-birth weight and preterm infants at $14,000 to $30,000 in 1988, with lifetime costs ranging as high as $400,000 (Chollet, Newman, and Sumner, 1996).

Although the overall cost of low-birth weight for African-American babies is not known, some rough calculation can help estimate this expense. In 2000, the excess low-birth weight rate for African Americans was 5.4 percent (African-American low-birth weight rate minus overall low-birth weight rate, 13.0 - 7.6). The excess of African-American low-birth weight babies for that same year was 33,620 (the percentage of excess of low-birth weight African-American babies times the total number African-American births - 5.4% of 622,598 = 33,620). In 2000, the total dollar cost of African-American disparity in low-birth weight was $504 million in 1988 dollars (excess of low-birth weight African-American babies times direct dollar costs per each low-birth weight baby - 33,620 x $15,000). Even if these are only rough calculations, the cost of racial disparities in low-birth weight is undeniably substantial (LeClere and Soobader, 2000).

1.10 Race, Class, and Birth Outcomes
It is not clear whether low-birth rates among African-American infants are the result of socioeconomic status (SES); caused by a greater preponderance of known risk factors, such as hypertension among African-American women; or are the result of differences in factors, such as psychosocial status, housing, or maternal infections, that have not been well studied, or cannot be explained by the factors enumerated. The association between
lower SES and poor birth outcomes has been well documented in the United States (Pearl, Braveman, and Adams, 2001). Women with lower levels of income have worse health than their economically favored counterparts (Williams, 2002).

Another possible contributing factor is stress which is a very complex phenomenon. Differences exist in individuals’ capacity to withstand stress, and some are more reactive than others to a stressful stimulus. Women of all races and ethnicities are exposed to gender-related stress, but minority women are exposed to additional sources of stress (Hogue and Vasquez, 2002). Racial and ethnic populations are among the fastest growing of all communities in America. Yet, blacks, Hispanics, American Indians/Alaska Natives, Asian Americans, Native Hawaiians and other Pacific Islanders in many respects, have poorer health and remain chronically underserved by the health care system (O.M.H., 1999). Differences in accessibility, utilization, quality of care, and benefits derived from medical care are factors contributing to inequality. However, an increase in economic inequality between SES groups (and the continued association of SES and ethnicity) is the driving force behind the rise in health disparities (O.M.H., 1999).

The need for health care providers and health care practitioners to find other mechanisms to promote changes in risk behaviors and health practices becomes essential in eliminating health disparities among racial and ethnic populations. In order to improve the birth outcomes among African-American women, public health advocates and officials must investigate innovative strategies and public health interventions that target these groups of people. These strategies and interventions must meet the diverse needs of minority women and be targeted toward risk factors that are prevalent in these groups.
Resource mothers or other types of lay health advisor intervention types may serve as a source for helping to eliminate poor birth outcomes among this population group (Rauh, Andrews, and Garfinkel, 2001).

Although African-American women carry a disproportionate burden of individual risk factors, such as unmarried status and late entry into prenatal care, racial differences in the distribution of such risks do not explain the disparity in birth outcomes, nor are interventions based on these factors likely to reduce the racial gap. Some individual risk factors operate differently across racial/ethnic groups (Rauh, Andrews, and Garfinkel, 2001). Therefore, it is important to target intervention strategies towards each individual ethnic group.

Several studies have suggested that African Americans may be more attuned or receptive to social support interventions than other groups. For instance, a survey of St. Louis residents conducted as a basis for evaluation of the Neighbors for a Smoke-Free North Side project found differences between African Americans and whites in their responses to an item asking “how important would the support of your family and friends be to you in quitting smoking”? After controlling for age, education, income, and smoking status, African-American respondents indicated greater importance of social support for quitting than did whites (N.I.H, 1992). Further analysis of surveys of St. Louis residents also reflected the pattern of African Americans to rely more on their extended kin network for social support than do whites. Different social environments can account for differences in health status. As John Cassel noted, aspects of the social environment are capable of producing profound effects on host susceptibility to disease. One measure of psychosocial stress during pregnancy is lack of social support, which has
been fairly consistently associated with adverse pregnancy outcome (Rowley, Hogue, Blackmore, Ferre, Hatfield-Timajchy, Branch, and Atrash, 1993). Studies have also shown that social support is particularly influential in helping women cope with serious medical problems (Hurdle, 2001).

1.11 Risk Factors for Low-Birth Weight

This study uses a conceptual model that includes the following maternal risk factors for reducing low-birth weight among African-American infants: (1) access to and quality of prenatal care; (2) prenatal smoking, drinking, and substance abuse; (3) pregnancies among adolescent mothers and women age 35 years and over; (4) nutritional status and (5) social support.

These risk behaviors and health practices have proven resistant to change (Spencer and Logan, 2002). According to Health, United States, 2000, a larger proportion of health disparities still exist among African Americans than any other population group. These statistics show little or no improvement from year to year. Interventions to increase birth weight in disadvantaged groups have been largely unsuccessful (Paneth, 1995), and although the mean birth weight has increased (Alberman and Botting, 1991) the rate of change is slow and the gradient remains unchanged (Spencer and Logan, 2002).

1.11.1 Lack of Access to and High Quality Prenatal Care

There is a consistent relationship associating the absence of prenatal care with increased risk for preterm birth, low-birth weight, and perinatal mortality. Despite increased government financing and repetitive calls for increasing access and use of prenatal care, the relationship of prenatal care to pregnancy outcome continues to be a
topic of considerable debate. Numerous studies have documented the barriers to prenatal care, including poor access because of financial constraints, inadequate system capacity, complicated procedures required to access the health care system (i.e., not user friendly), denial or lack of awareness of gestation, personal attitudes or beliefs about the importance of prenatal care, and social isolation (Gregory and Davidson, 1999).

Access to prenatal care and high quality care allows for ongoing screening and treatment for medical disorders, such as nutritional abnormalities, weight gain, infectious diseases, hematological disorders, fetal growth disturbances, diabetes, and preeclampsia. Typical demographic factors such as extreme age (being old or young), marital status of single, lower SES, and lower educational achievement are strongly correlated with poor pregnancy outcomes and low-birth weight. Although these risk factors are very difficult to modify, women with these risk factors may benefit the most from prenatal care. Prenatal care practitioners can also obtain information regarding smoking history, to monitor and reinforce efforts to quit smoking, and to advise patients on specific pregnancy-related complications and the benefits of smoking cessation. The same strategy would be helpful to those mothers who drink alcoholic beverages and also those who use illegal drugs (Gregory and Davidson, 1999).

1.11.2 Prenatal Smoking, Drinking, and Substance Abuse

Smoking during pregnancy has deleterious health consequences for the unborn child as well as the mother. These adverse effects include low-birth weight for the unborn child, sudden infant death syndrome (SIDS), respiratory syncytial virus bronchiolitis, asthma exacerbations, perinatal death, spontaneous abortion, abruptio
placentae, premature rupture of membranes, and childhood respiratory disorders (Hutchison, Stevens, and Collins, 1996).

Smoking rates during pregnancy are lower among black women than white women after controlling for socioeconomic status. However, black women who smoke have higher rates of low-birth weight and other pregnancy complications. Studies suggest that cotinine concentrations may be higher among blacks than whites even after adjustment for number of cigarettes smoked (Caraballo, Giovino, Pechacek, Mowery, Richter, Strauss, Sharp, Eriksen, Pirkle, and Maurer, 1998).

Smoking among pregnant African-American women may be attributed to the fact that the tobacco industry donates hundreds of thousands of dollars a year to African-American community groups. Black and Hispanic neighborhoods have significantly more tobacco and alcohol outdoor advertising than white or Asian-American neighborhoods (Carballo, Giovino, Pechacek, Mowery, Richter, Strauss, Sharp, Eriksen, Pirkle, and Maurer, 1998).

Minority women may use alcohol during pregnancy because they are unaware of its effects. Because of environmental conditions and poverty, some people may live in conditions where alcohol use is common. As discussed earlier with smoking, African-American women may drink during pregnancy because highly segregated areas are characterized by concentrated poverty, inadequate health care, substandard housing, crime, violence, and other stressors. The lack of a strong social support system may also contribute to smoking during pregnancy. Also, minority women, especially,
African-American women, may drink because of myths in the community that supports
drinking during pregnancy (Solomon, 2002).

The increased use of drugs and alcohol in the United States is particularly
alarming in view of the current data that indicate use may be increasing faster in women
than in men, and that the overwhelming majority of drug-using women are of
childbearing age. Although pregnant women reported lower use rates of alcohol and
other drugs than nonpregnant women, the use levels of alcohol and other drugs among
pregnant women remain disturbingly high (Curet and Hsi, 2002). In 2002, 3 percent of
pregnant women aged 15 to 44 used illicit drugs in the past month, 3 percent reported
binge alcohol use, and 17 percent reported smoking cigarettes in the past month
(SAMHSA, 2002).

Most pregnant African-American women who use drugs, do not get pregnant and
then start using drugs; rather they are already drug abusers who get pregnant. Women
substance abusers have high levels of depression, anxiety, feelings of powerlessness and
low levels of self-esteem and self-confidence. A prenatal drug screen at Southside
Medical Center in Atlanta, Georgia, (one of the clinics in this study) found that
approximately ten percent of the pregnant mothers were using street drugs. In addition,
in 1994, a cocaine drug study conducted by the State of Georgia concluded 2% of infants
tested positive for cocaine use in Fulton County (Southside Healthcare, Inc., 1999).

1.11.3 Nutritional Status

Women with poor nutritional habits are at increased risk for delivering preterm
infants and infants with low-birth weights. It has also been proposed that maternal under
nutrition at critical stages of gestation can affect fetal growth and body shape. A study
conducted in 1999, proved that poverty negatively affected nutrition and thus pregnancy outcome. In the study, the increased incidence of growth restriction was caused by significantly reduced nutrition. Pregnant women living in poverty are more likely to eat less and to eat foods that are nutritionally inadequate (Symonds, Budge, and Stephenson, 2000).

The Women, Infants, and Children (WIC) program is a federally funded program for the purpose of improving low-birth weight among low-income women. It aims to achieve this goal by improving the nutritional status of pregnant women and mothers; and increasing access to high quality prenatal care. This program has been helpful to those women who use it (Hunter, Wulu, Thomas, Davis, Williams, and Smith, 1998). The WIC program and other intervention strategies could also contribute to the fact that among low-income African-American women living in the same neighborhood, some have better pregnancy outcomes than others. Some low-income African-American pregnant women may have poor nutritional habits because they are accustomed to eating foods that have high fat content. Some pregnant women lack the necessary knowledge regarding the proper nutritional habits needed during pregnancy. Educational attainment is a factor that plays a major role in the health behaviors of low-income African-American women that contributes to their nutritional habits and other health behaviors.

1.12 Efforts to Improve Birth Outcomes

In order to improve the birth outcomes of African-American women, public health advocates and officials must investigate innovative strategies and public health interventions that target these groups of people. There are a few intervention strategies that target maternal behaviors and low-birth weight. One effort of the federal
government to provide nutritional education and supplemental foods to low-income families across the United States is the Special Nutritional Program for Women, Infants, and Children (WIC). WIC increases rates of early prenatal care and reduces the frequency of low-birth weight infants (Kendal, Peterson, Manning, Xu, Neville, and Hogue, 2002). Another strategy the federal government is using calls for the expansion of eligibility criteria for Medicaid coverage for maternity care. An intervention strategy, which consists of a prematurity prevention program, was performed by Group Health Incorporated, a staff model health maintenance organization, and Park Nicollet Medical Center, a large multispeciality group practice, both with offices located in Minneapolis and St. Paul, Minnesota. The program consists of several components, including increased intensity of contact with the prenatal care provider and enrollment of high-risk patients in a prematurity prevention class (Fangman, Peter, Pratt, Conway, Healey, Oswald, and Uden, 1994). This program addresses the three strategies related to the WIC study because it addresses the issue of improving access to and quality of care; it consists of intervention strategies to reduce prenatal smoking, drinking, and substance abuse; and it promotes good nutritional habits.

Another program targeted towards preventing, reducing, and eliminating maternal smoking, drinking and illegal drug use, is an individualized smoking cessation counseling intervention conducted by a trained counselor at the University of Vermont. This program is for pregnant women who smoke one or more cigarettes per day (England, Kendrick, Wilson, Merritt, Gargiullo, Zahniser, 2001). Few interventions have addressed alcohol and illegal drug use for pregnant women. This program addresses one of the
major strategies of this study for reducing low-birth weight; reducing maternal smoking, drinking, and illegal drug use.

1.13 Lay Health Advisor Models/Resource Mothers Programs

One strategy to improve the low-birth weight of African Americans is to utilize lay health workers from the same communities who are trained to reduce cultural barriers to care, educate patients on healthy behaviors and practices, and implement strategies to improve access to care. These intervention strategies may serve as vehicles to improve health care and health outcomes among racial and ethnic populations. All of these factors play an important role in decreasing low-birth weight among infants.

Another strategy to improve low-birth weight was the establishment of Resource Mothers Programs in 1987 throughout the United States by the National Commission to Prevent Infant Mortality. Through the project, the commission has developed training and implementation guides and provides technical assistance to help communities establish their own or strengthen existing Resource Mothers Programs. Since this initiative that represents a federal commitment to home visiting began, many home visiting programs using paraprofessionals (lay health advisors) from participating communities have been established to visit pregnant women. However, many of these Resource Mothers Programs use nurses as home visitors; and only a few of these programs are targeting low-birth weight among African-American women. Also, only a few of these programs have been published or evaluated (The Future of the Children, 1993).

Currently, there are a few published accounts of lay health advisor interventions and Resource Mothers Programs that target low-birth weight infants among pregnant
African-American women or women in general. One intervention, a Resource Mothers Program in South Carolina employed paraprofessionals (lay health advisors) to visit pregnant women and children. One of the goals of the resource mothers was to improve birth outcomes. The resource mothers serve as mentors to the expectant mothers throughout their pregnancy, delivery, and the first year or more of the child’s life (Olds and Kitzman, 1993).

Another intervention strategy was a Resource Mothers Program in Norfolk, Virginia. The purpose of the study was to determine if higher rates of prenatal care helped to improve the low-birth weight rate among teenagers. The study used lay health advisors who were similar in race and socioeconomic status as the pregnant teenagers in the study. Clients in the study were age 17 years and younger. The results of the programs showed that the clients had a higher incidence of early prenatal care and a higher birth rate (Julnes, Konefal, Pindur, and Kim, 1994).

The Missouri Volunteer Resource Mothers Program is a mentoring program for pregnant and parenting teens. One of the goals of the program is to improve the health of the teen mothers and her infant. Pregnant teens are matched with trained volunteer mentors (resource mothers) who agree to spend a specified amount of time each week providing information, support and friendship until the baby is at least one year old. Potential mentors are recruited by word of mouth and local media. Teens and mentors are interviewed separately and then matched based on their interests, preferences, lifestyles and scheduled. Teens and mentors may attend parenting classes, access
community services, prepare for childbirth or participate in recreational activities (Pike, 2001).

1.14 The Resource Mothers Program

In 1997 the Resource Mothers Program was established, after the director of Southside’s WIC clinic applied for a grant with the State of Georgia’s Women’s Health Program. The director felt the need for clients to obtain more help in the form of social support, social services, counseling, and training. Initially, the goals for the program were to focus on the benefits and importance of early prenatal care and breast-feeding of infants. In recent years, as stated in the program grant proposal, the goals of the program changed and are now to increase the knowledge and awareness of women about the benefits of breast-feeding, prenatal care, and learning parenting skills; to increase the number of women who decide to breast-feed and seek prenatal care during their first trimester; to provide support by increasing access to the healthcare system and reducing socio-cultural barriers; to reduce the number of repeat pregnancies in the teen population; and to develop a strong male mentorship within the program in order to increase the father’s role within the family. Of particular interest to the present study are the goals of addressing access to prenatal care and reducing infant mortality (Southside Healthcare, Inc., 1999).

Resource mothers were recruited for the program from the clients who participate in the WIC clinic or either the Breast-Feeding Incentive Program, from the community, and by word of mouth. The resource mothers were volunteers and received no compensation for their services. Each volunteer received training in confidentiality, communication techniques, self-esteem building, pregnancy and prenatal care, labor and
delivery, postpartum care and planning, caring for the baby, child and growth
development, managing home visits, safety and case management. These women were
between the ages of 30 to 60 years, and were all African American.

The resource mothers were an addition to the WIC staff. They identified areas of
need, provided a link between the nutritionist and the client, promoted good nutrition and
stressed the importance of learning parenting skills to the outreach communities. These
outreach workers helped with special activities geared towards different populations
within the community. The clients were provided with continuous follow-up from the
resource mothers by making periodic home visits, telephoning the clients, and writing
letters to the clients who had no telephones. Other services that were provided by the
resource mothers were transporting the clients to appointments or referrals; serving as
mentors and sounding boards; educating the clients on poor pregnancy outcomes and the
effects of using alcohol, tobacco and illegal drugs, providing feedback to the clients and
allowing clients to evaluate themselves.

These resource mothers bonded with the clients, as if they were members of their
families. This bond helped link young women and mothers to the healthcare system. As
members of the community, the resource mothers may be able to assist health care
providers and health care practitioners in successfully implementing health promotion
and health behavior initiatives in communities where previous strategies have failed.
Consistent with the other lay health advisor programs, the Resource Mothers Program
may be a successful strategy for helping to reduce low-birth weight among low income
African Americans. The goal of this study is to determine whether and how the Resource Mothers Program worked.

1.15 Methods

In order to answer the research questions and hypotheses, this study examined data from the Southside Medical Center’s WIC Program and another WIC clinic in the Atlanta area, that serves a comparable population. The resource mothers at Southside and clients at both clinics were also interviewed.

1.15.1 Overview of the Grady Memorial Hospital

Grady Memorial Hospital is located in the heart of downtown Atlanta, where it had been established in 1892 (see Appendices, Table A.1). For several decades the hospital has been the primary teaching hospital for the Emory University School of Medicine and Morehouse School of Medicine. Grady is the primary hospital for inner city and medically indigent populations in the Atlanta metropolitan area. Grady is a 953 bed institution operated by Fulton and Dekalb counties providing primary care to indigent patients in the Atlanta metropolitan area. The Grady Health System maintains its commitment of offering medical services to the underserved, including governmental sponsored programs (Grady Health System, 2004).

The nucleus of Grady’s service area is Fulton county (718,336) and Dekalb County (589,796) populations. Hospital services are contracted to provide health care to the medically uninsured and under-insured populations. This provides Grady with a patient base from a predominantly urban, inner-city environment which encompasses a customer base of 1.3 million residents which is approximately 73 percent African American.
American, 22 percent white, 3 percent Hispanic, 1 percent Asian American, and 1 percent other ethnic groups (Grady Health System, 2004).

The Grady Memorial Hospital runs WIC clinics on site and at three other WIC facilities in Atlanta: Hugh Spaulding Children’s Hospital, Lindbergh Center, and Ponce De Leon Center. These WIC clinics (collectively referred to as “Grady”) serve mostly African Americans and Hispanic clients. In 1998, the Grady Memorial Hospital served 3,614 women and 3,647 infants and children. Currently, the Grady’s WIC clinic serves 4,969 patients. Patients at Grady Memorial Hospital utilize the clinical setting approach. Patients are referred by the hospital or are walk-ins. Most of these clients are between the ages of 15 and 44. At Grady, patients come from all parts of the Atlanta metropolitan area seeking services. The clients at Grady receive their counseling, education, and services mostly from nutritionists on staff within the clinic. Unlike the Southside Medical Center, this WIC clinic does not utilize the services of community health workers such as the Resource Mothers. However, most mothers who attend Grady’s WIC clinic also deliver their babies at the Grady Memorial Hospital. After the babies are delivered, most of the mothers and babies are referred to other WIC programs (Grady Health System, 2004).

1.15.2 Overview of Southside Medical Center

Southside Medical Center, founded in 1968, is a non-profit health organization (See Appendices, Table A.1). The goals of this clinic are to provide healthcare services to impoverished neighborhoods. The organization’s service areas are primarily poor neighborhoods in Southside Atlanta, specifically through Fulton, Dekalb, and Clayton counties, including the Thomasville Heights area adjacent to a federal prison. This
service area includes eight public housing complexes where most of the citizens have limited access to routine medical services. Twenty-three of the 41 census tracts served are federally designated as both medically under-served and as health manpower service shortage areas. An additional eight census tracts have been federally designated as solely a health manpower shortage area (Southside Healthcare, Inc., 1999).

There are approximately 198,000 individuals residing in the Southside Atlanta area; almost 70% are African American. Currently, 53% of all clients receiving care at Southside Healthcare, Inc., have incomes at or below poverty level. In addition, 85% of the clientele receive Temporary Assistance for Needy Families (TANF) (Southside Healthcare, Inc., 1999).

In 1996, there were more than 32,936 individuals receiving medical services at Southside, and 10,977 receiving prenatal care. The Southside Medical Center provided prenatal care to 977 of these women. Of those 977 women, 128 were between the ages of 10 and 19 years. Patients at the Southside Medical Center mostly consist of community residents who live in the surrounding area. They are referred by the community center or physicians, or are walk-ins. The resource mothers and nutritionists provide services to the clients at Southside. The nutritionists provide counseling, education, nutritional support, and other services to the patients. The resource mothers serve as mentors to the patients and see patients in their homes as well as at the clinic (Southside Health Care, Inc., 1999).

1.15.3 Data for the Study

Both quantitative and qualitative data were used to ensure the confirmation and corroboration of the information gathered, and to enhance the scope of the study by
synthesizing multiple data sources. The combination of data sources limits the study bias. The quantitative data provided an overview of the two clinics and background information on the clients to ensure comparability of the clients in both clinics and to assess birth outcomes. The qualitative data enhanced the study by providing information pertaining to the resource mothers and their responsibilities in the clinic and their relationship with the clients, by clarifying quantitative findings regarding the patients in both clinics. Two types of data were used for the qualitative portion of the dissertation: (1) interviews with the resource mothers, and (2) interviews with the clients.

Quantitative data for the study were obtained from the State of Georgia’s WIC Program. Subjects were clients from two WIC clinics in Atlanta, Georgia, the Grady Memorial Hospital’s WIC clinic and the Southside Medical Center’s WIC clinic. Data for this study were obtained from the State of Georgia’s WIC Program, for fiscal years 1999 and 2000. Included in the data were 361 clients from Southside Medical Center’s WIC Program, 152 clients from Grady Memorial Hospital’s WIC Program. The State of Georgia data set included information on 49,215 clients.

The data for the clients were collected when the clients entered the program and when their babies were born. It was expected that there were no differences in risk factors (or that Southside was worse off because resource mothers increased access to care and thereby attracted clientele who otherwise would not show up in the Grady data). The Resource Mothers Program was effective to the extent that the relationship between

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the risk factors at intake and the likelihood of a low-birth weight baby was less among women exposed to the Resource Mothers Program.

1.15.4 Overview of the Georgia WIC Program

In 1972, the WIC program was established by Congress to improve birth outcomes and early childhood education among high-risk populations. WIC is a special nutrition program for low-income pregnant, postpartum and breast-feeding women and children up to the age of 5 years. To receive WIC services, program participants must meet income guidelines, state residency requirements and be determined to be at nutritional risk. The two types of nutritional risk recognized by WIC eligibility guidelines are medical risk and dietary risk. Medical risks include conditions and factors such as anemia, metabolic disorders, maternal age, history of pregnancy complications, or poor pregnancy outcomes. Dietary risk refer to inadequate dietary patterns, such as missing any food group based on the recommended daily serving’s chart, failure to meet the recommended number of servings for two food groups and the use of two inappropriate food practices based on the inappropriate food practices list. The program provides nutritious foods, breast-feeding promotion and support, and referrals to other health services. The Georgia WIC program is 100 percent federally funded and serves families with incomes up to 185 percent of the federal poverty level (Hunter, Wulu, Thomas, Davis, Williams, and Smith, 1998).

The Georgia WIC Program is the nation’s seventh largest WIC program. On average, the Georgia WIC Program provides benefits to 259,992 participants each month. Children are the largest category of WIC participants. WIC services are provided through nineteen health districts and two contract agencies. Services are provided at over
267 health clinics including: 19 hospitals, 8 Divisions of Family and Children Services, and via in-home certifications. There are over 1800 authorized food retailers that participate in the WIC food delivery system (Hunter, Wulu, Thomas, Davis, Williams, and Smith, 1998).

WIC gives pregnant women, new mothers, and their children vouchers for basic foods including milk, cheese, eggs, cereal, dried beans, peanut butter, fruit juices and (for those who do not breast-feed) infant formula. Tuna and carrots are included in the food packages prescription for women who exclusively breast-feed. WIC foods are high in protein, calcium, iron and vitamins A and C. These nutrients are frequently lacking in the diets of the low-income targeted population.

WIC staff encourages women to breast-feed and counsels patients about nutrition. Staff identifies affordable prenatal care and encourages patients to apply for Medicaid, food stamps, TANF, immunization and other services. Georgia WIC spent $113 million in federal funds during fiscal year 1999 (Hunter, Wulu, Thomas, Davis, Williams, and Smith, 1998).

Nationally, over 71.4 million people receive WIC benefits each month. Participation has risen steadily since the program began. During 1998, the Georgia WIC Program served over 220,000 participants, across 159 counties via 21 local agencies. The state-wide agency consists of 19 district health departments and two contracted health
agencies. All of the local WIC agencies are governed by the State of Georgia’s WIC Program (Hunter, Wulu, Thomas, Davis, Williams, and Smith, 1998).

1.16 Summary

This study was conducted using both qualitative and quantitative research methods to examine the roles of the clinics and their effectiveness in improving low birth weight among infants born into the programs. Qualitative research questions were designed for the study as well as quantitative research hypotheses. Interviews with resource mothers and clients were conducted to examine the role and effectiveness of the Resource Mothers Program. The analyses of the interviews clarify how the Resource Mothers Program was successful in helping to decrease low-birth weight among the pregnant women at the Southside Medical Center’s WIC clinic who utilized the services; and whether the program was instrumental in helping clients to continue their care at the facility. Data analysis for the qualitative data was conducted using EX-Text software for coding, codebook developing, and to identify common themes among the clients and resource mothers.

The quantitative research hypotheses were designed to test the significance between pregnant women who participated in the Southside Medical Center’s WIC Program where there was a Resource Mothers Program and the pregnant women who participated in the Grady Memorial Hospital’s WIC Program where there was no Resource Mothers Program. Logistic regression was used to perform the multivariate analyses. The cross-sectional data analyses was conducted using low-birth weight as the dependent variable, exposure to the Resource Mothers Program (attendance at Southside
or Grady) as the primary predictor variable of interest, and the other variables in the study as potential confounders or effect modifiers.

Low-birth weight is a major concern for infants born to African-American women. The prevention of low-birth weight can yield marked reductions in perinatal morbidity and mortality. This study used a conceptual model that included the following maternal risk factors for reducing low-birth weight among African-American infants: (1) access to and quality of prenatal care; (2) prenatal smoking, drinking, and substance abuse; (3) pregnancies among adolescent mothers and women age 35 years and over; (4) nutritional status and (5) social support. The literature showed that there was general consensus that these maternal risk factors were the most effective means of reducing rates of low-birth weight.
CHAPTER 2

2. Review of Literature

2.1 Introduction

Each year, more than four million families in the United States, bring home from the hospital a healthy baby who has all of the potential for a full and productive life. But one family in 100 will suffer the loss of their child soon after birth. Nearly 40,000 babies die each year. More than three-quarters of infant deaths are caused because babies are born too small or too early. The occurrence of these infant deaths is highly correlated with size at birth and length of gestation; the proportion of deaths increases with decreasing birth weight and gestation. The underlying cause of infant mortality and childhood morbidity is low-birth weight (Shiono and Behrman, 1995).

Low-birth weight is, at once, a public health problem of the first rank and a scientific problem of immense interest. As a public health problem, its high priority stems from the facts that it is the major determinant of infant mortality in developed countries and that it contributes substantially to the overall burden of low-birth weight among infants. Low-birth weight is more common in the United States than in most other Western European nations and it along with preterm delivery (usually referring to birth prior to 37 completed weeks of gestation), are the differences that account for the United States’ relatively high rate of infant mortality (Paneth, 1995).
Chapter two, the review of literature, discusses issues pertaining to low-birth weight. This chapter is divided into six sections. Those sections include: 1) the introduction; 2) the definition of low-birth weight; 3) cognitive and neurological functioning; 4) the theoretical model; 5) race and socioeconomic status, 6) risk factors for low-birth weight (access, diet, smoking, substance use, social support); and 5) prevention strategies.

2.1.1 Definition of Low-birth weight Infants

Low-birth weight is not a diagnosis, but serves as a convenient label to identify a group of babies with similar types of risks. Low-birth weight (LBW) infants (see Appendices, Table A.1) are the percentages of live births in which infants weigh less than 2500 grams (5.5 pounds or less at birth) (OMH, 1999).

Birth weight is a useful indicator of maternal nutrition and fetal growth. It is also a powerful predictor of growth, morbidity, and survival of the newborn (Walraven, Mkanje, van Asten, van Roosmalen, van Dongen and Dolmans, 1997). Low-birth weight infants consist of two major groups: those who experience normal growth but are born too early (preterm) and those who are born at term but have inadequate fetal growth (intrauterine growth retardation) for gestational age. Preliminary data from the National Center for Health Statistics show that 13.0 percent per 1,000 live births of African-American infants were low-birth weight. In 2000, 7.7 percent per 1,000 live births from all races were born with low-birth weight (C.D.C., 2002).

There are two other categories of low-birth weight babies. Those categories are very-low-birth weight (VLBW) infants and extremely low-birth weight (ELBW) infants. Very-low-birth weight infants are those infants born weighing less than 1500 grams (3.3
pounds) (Gould, Benitz, and Liu, 2000). Extremely low-birth weight (ELBW) infants are those infants who weigh less than 1000 grams at birth (2 pounds and 3 ounces), (Gould, Benitz, & Liu, 2000). Very-low-birth weight infants and ELBW infants, have a high risk of death, serious illness, and permanent disabilities. ELBW infants are at significant risk of neurological abnormalities, developmental delays, and functional delays at 18 to 22 months (Vohr, Wright, Dusick, Mele, Verter, Steichen, Simon, Wilson, Broyles, Bauer, Delaney-Black, Yolton, Fleisher, Papile, and Kaplan, 2000).

2.2 Cognitive and Neurological Functioning

During the 1960s, the introduction of neonatal intensive care methods, lead to a marked decrease in the rates of cerebral palsy and neurodevelopmental handicap. Survival continued to improve during the 1970s and the 1980s; however with few exceptions, rates of cerebral palsy and neurodevelopmental handicap in early childhood among very-low-birth weight children remained essentially unchanged (Wojtulewicz, Alam, Brasher, Whyte, Long, Newman, and Pearlman, 1993). As a result of these trends, there has been an increase not only in the absolute number of surviving children with normal development but also in the number of children with handicapping conditions (Bhushan, Paneth, and Kiely, 1993).

2.2.1 Mortality

Birth outcomes determine infant mortality in industrialized countries, and a society’s overall health is directly related to the incidence of low-birth weight. Low-birth weight is, in fact, so directly related to neonatal mortality that the relative position of each state’s neonatal mortality rate can be predicted with reasonable accuracy from the proportion of low-birth weight infants among live births. Very-low-birth weight infants
are virtually always born preterm and their mortality is considerable even in the presence of intensive care. Low-birth weight and/or preterm delivery are factors in most neonatal deaths in the United States (Paneth, Qiu, Rosenbaum, Saigal, Bishai, Jetton, den Ouden, Broyles, Tyson, and Kugler, 2003).

2.2.2 Growth

Birth weight related differences in mean weight, height, and head circumference are more common with lower birth weight. Poor growth attainment is seen in both preterm and full term children who are small for age following intrauterine growth failure. It is also seen in preterm children who have normal intrauterine growth but fail to grow after birth, because of severe neonatal complications of prematurity such as chronic lung disease (Hack, McGrath, McGrath, Jones, Fanaroff, 1984).

2.2.3 Cognitive and Neurological Outcomes

Low-birth weight infants are found to have poor neurosensory outcomes, poor cognitive and neuropsychological outcomes, problems with behavior and social competence, poor school performance and academic achievement, and adverse health outcomes as well as problems with poor growth attainment. Cerebral palsy is the most common major neurological abnormality in low-birth weight children. Other neurosensory outcomes for low-birth weight infants are hydrocephalus, microcephaly, blindness, deafness, and seizures, the overall rates of these conditions are remarkably consistent and range from approximately 20% for children with birth weights of less than 1,000 grams (2 pounds, 3 ounces) to 14% to 17% for children with birth weights of 1,000 to 1,500 grams (from 2 pounds, 3 ounces to 3 pounds, 5 ounces) and 6% to 8% for children with birth weights of 1,500 to 2,499 grams (from 3 pounds, 5 ounces to 5
pounds, 8 ounces). In comparing low-birth weight children with normal birth rate children, rates below 5% are reported for children of normal birth weight (The Scottish Low-birth weight Group, 1992).

Findings by Hack and her colleagues suggest a relationship between the degree of low-birth weight and the neuropsychological outcome (Hack, Taylor, Klein, and Eiben, 1994). Extremely low-birth weight children performed more poorly on an extensive battery of neuropsychological tests than did infants born either at higher weights (between 750 and 1,499 grams) or at term. For several of the outcome measures, differences between the very low-birth weight infants and the term infants were twice as large as differences between the children with birth weights between 750 and 1,499 grams and the children in the full-term group (Hack, Klein, and Taylor, 1995).

2.2.4 Child Behavior

A majority of studies on behavior and social competence in low-birth weight children pertain to very low-birth weight and extremely low-birth weight outcomes. Using parent and/or teacher ratings, these studies document an increased risk of behavioral problems (Brandt, Magyary, Hammond, and Barnard, 1992), especially among boys (Sommerfelt, Ellertsen, and Markestad, 1993). McCormick (1990) and Petersen (1990) found greater rates of behavioral problems with lower birth weight. Behavioral problems have mainly been described in children with cognitive deficits and neuromotor dysfunction, suggesting brain injury as a cause of these problems. The types of behavioral problems reported in low-birth weight children include conduct disorder, (Teplin, Burchinal, Johnson-Martin, Humphry, and Kraybill, 1991), hyperactivity, (Brandt, Magyary, Hammond, and Barnard, 1992) and attentional weaknesses (Szatmai,
Saigal, Rosenbaum, Campbell, and King, 1990). Using parent and teacher behavior ratings, Szatmari and colleagues (Szatmari, Saigal, Rosenbaum, Campbell, and King, 1990) diagnosed attention-deficit hyperactivity disorder (ADHD) in 16% of the children born with birth weights of less than 1,000 grams (2 pounds, 3 ounces) compared with 6.9% of the children in a matched control group (Hack, Klein, and Taylor, 1995).

Learning problems among low-birth weight children have been documented by teacher or parent ratings of school performance and direct assessments of academic skills in clinical settings. McCormick and others (1990) analyzed data from the National Health Interview Survey of 1981 and found an increased rate of parent-reported learning problems with decreasing birth weight. Additional studies suggest similar results (Sommerfelt, Ellertsen, and Markestad, 1993). Levels of achievement in reading, spelling, and math are also lower for very low-birth weight children than for full-term children (Ross, Lipper, and Auld, 1990).

2.3 A Theoretical Framework for Low-birth weight

The theoretical framework consists of four categories of risk factors that are associated with low-birth weight. These categories are the individual, environmental, behavioral, and biological/medical factors (see Figure 2.1). These maternal characteristics of the mother consist of individual risk factors (see Figure 2.1) for low-birth weight that influences an infant being born with low-birth weight. Individual risk factors are composed of sociodemographic and socioeconomic predictors of low-birth weight. African-American women with low socioeconomic status are at increased risk for delivering low-birth weight babies, whether socioeconomic status is defined by income, occupation, or education. Education may also have independent
effects, above and beyond income, because more highly educated mothers may know more about family planning, access to care, and healthy behaviors during pregnancy. Marital status disparity may reflect either the greater likelihood of unmarried mothers to be poor or characteristics that vary by marital status. The teenage mothers are vulnerable to becoming pregnant because of peer pressure, neighborhood characteristics, social norms, and living conditions. Also, many teen pregnancies are unplanned, unwanted, or discovered late, and pregnant teens are more likely to be poor, to be undereducated, or lack access to resources or services – all in themselves, risk factors for low-birth weight. On the other hand, according to the literature review, African-American women who give birth in their late thirties or older are also at increased risk of having low-birth weight babies. Older women also have more unintended pregnancies, which is also a risk factor for low-birth weight.

Environmental risk factors are the physical environmental factors that effect low-birth weight. For African-American mothers, environmental risk factors (see Figure, 2-1) appear to have a independent effect on the birth weight of babies. Living in a poor neighborhood may pose health risks associated with individual poverty. Houses and other buildings in poor neighborhoods tend to be older and in poor condition; environmental toxins tend to be high; and access to medical care and other services tend to be limited. Occupational exposures before conception may affect infant health. Environmental risk factors such as stress, racism, and politics are heavy burdens on pregnant women, especially African-American women. Lack of social support and social
networks often cause stress among African-American women and are found to be risk factors for low-birth weight.

Behavioral risk factors (see Figure 2.1) are practices that can be prevented and are changeable. Behavioral risk factors are directed towards specific behaviors of pregnant women. These risk factors include personal factors that are modifiable or controllable at the individual or community level. For instance, interventions strategies can help to reduce cigarette smoking, alcohol use, and drug use. Better nutrition can improve birth weight.

Medical risk factors/complications (see Figure 2.1) of labor and delivery present the greatest risk for low-birth weight. Pregnant women who experience these conditions

![Risk Factors for Low Birth Weight]

Figure 2.1: Risk Factors for Low-birth weight
are more likely to have a low-birth weight baby. These conditions occur relatively infrequently when compared with individual, environmental, and behavioral risk factors. Eliminating or reducing these risk among pregnant African-American women would significantly reduce the low-birth weight rate overall. Individual risk factors are often interrelated with environmental risk factors, which influence a person’s behavior. The combination of individual, environmental, and behavioral risk factors often cause biological/medical risk factors (complications) for low-birth weight. Individual, environmental, behavioral, and biological/medical risk factors all contribute to an infant being born with low-birth weight.

2.4 Race and Socioeconomic Status

Low-birth weight is strongly associated with race and socioeconomic status, such that rates of low-birth weight decrease with improvements in socioeconomic status (SES), (Rich-Edwards, Krieger, Majzoub, Zierler, Liverman, and Gillman, 2001). Race and low SES position are two social categories that lead to the differential distribution of health risks and thus to variation in the rates of disease in society (Williams, 2002). Understanding the differential distribution of health outcomes across racial/ethnic and socioeconomic groups requires attention to how historical, social, economic, political, and cultural structures and processes shape health-damaging and health enhancing factors that are typically measured at the level of the individual. Historically and today, most
programs and policies directed at low-birth weight prevention attempt to address the individual health consequences of economic and social disadvantage.

2.4.1 Race and Birth Weight

Race, social, and environmental disadvantages clearly have an affect on the long-term developmental outcomes of low-birth weight children, whether measured in terms of maternal education, or social class (Hack, Breslau, Aram, Klein, and Borawski, 1992). Racial discrimination is experienced by people of color across social class. It is hypothesized that racial discrimination has effects that are both independent of and interacting with socio-economic position. Evidence is growing that the experience of racial discrimination may increase the risk of preterm delivery (Rich-Edwards, Krieger, Majzoub, Zierler, Lieverman, and Gillman, 2001) that accounts for most low-birth weight babies. For most low-birth weight children, social risk factors have a far greater effect on long-term cognitive outcomes than do biological/medical risk factors. There is also evidence that the cognitive deficits specifically associated with social or environmental risks become more pronounced over time (Hack, Breslau, Aram, Klein, Borawski, 1992). Socioeconomic status is a term conventionally used for reference to an individual’s or group’s location in the structure of society that determines differential access to power, privilege, and desirable resources. SES is typically assessed by income, education, or occupational status (Williams, 2002).

An example of what may be a psycho physiological response to racism is pregnancy outcome. Although there is a significant gap in mortality rates between the infants of all white and African-American mothers, there is an even greater gap between the infant mortality rates of white and black mothers of higher socioeconomic status.
Mortality rates for infants born to college-educated African-American parents (from 1983 to 1985) were 90 percent higher than the rates among infants born to college-educated white parents. This excess mortality was due primarily to higher rates of death associated with premature delivery and low-birth weight of the babies (N.C.H.S., 2002).

### 2.4.2 Socioeconomic Status and Birth Weight

Social factors define a range of social, cultural, and economic circumstances that are shared by people with similar levels of financial and educational resources. Social factors and disease are undeniably linked. Women who live in poverty, who have low levels of education, who work in low-wage jobs, and who have few other social resources are more likely to suffer adverse birth outcomes than are more advantaged women. College educated African-American women are more likely to deliver very low birth weight infants than college-educated white mothers (Reichman and Pagnini, 1997).

The association between low-birth weight and socioeconomic status persists across various measures, including the occupation of the mother and/or father, income, and education. At the individual level, a major study conducted in Great Britain found the risk of preterm delivery to be 50% higher and the risk of a term low-birth weight delivery to be 95% higher among women in lower social classes. In the United States, women on lower socioeconomic levels have been found to be at significantly higher risk of preterm delivery, even when controlling for other known risk factors such as prepregnant weight, weight gain, alcohol and tobacco consumption, race, parity, and source of prenatal care. At the geographic level, several studies have found that,
for any defined area, the more socioeconomically disadvantaged the population, the higher the incidence of low-birth weight (Davis and Collins, 1997).

In recent years, several studies have reported an association between measures of neighborhood socioeconomic deprivation and poor birth outcomes, even after accounting for personal socioeconomic characteristics of mothers. These studies support a growing literature demonstrating increased risk of adult mortality, long-term illness, self-related health, cardiovascular disease, and smoking associated with poorer socioeconomic conditions of neighborhoods. Such studies highlight the importance of the social environment, in addition to individual socioeconomic standing, in shaping individual behaviors and health outcomes (Pearl, Braveman, and Abrams, 2001).

2.4.3 International Findings

In many foreign countries, birth weights tend to reflect socio-economic conditions, in particular with regard to low-birth weight, which is repeatedly reported as being related to factors such as maternal education, the mothers’ cohabiting status and social position. This relationship appears to hold true at population level, as indicated by recent studies from former communist countries of Central and Eastern Europe on the impact of major social and political changes on birth weight distribution (Nolte, Koupilova, and McKee, 2002).

Recent studies from former communist countries of Central and Eastern Europe show that the impact of major social and political changes has an impact on birth weight distribution. In the Czech Republic, for instance, mean birth weight declined immediately after the fall of communism in 1989, attributed mainly to a decline in living standards during this period. Although increasing again after 1991, further analyses
indicated a slight worsening of the birth weight distribution with an increase in the proportion of very low-birth weight (Nolte, Koupilova, and McKee, 2002).

In the developing world, low-birth weight stems primarily from socioeconomic conditions caused by poor economy. Low-birth weight in these countries is linked with the mother’s poor health and nutrition. The three factors that have the most impact on low-birth weight are the mother’s poor nutritional status before conception, short stature (due mostly to under nutrition and infections during childhood), and poor nutrition during the pregnancy. Inadequate weight gain during pregnancy is particularly important since it accounts for a large proportion of fetal growth retardation. Moreover, diseases such as diarrhea and malaria, which are common in many developing countries, can significantly impair fetal growth if the mother becomes infected while pregnant. Existing data on low-birth weight from developing countries (such as Sub-Saharan Africa) is limited because many infants are not weighed at birth (United Nations International Children’s Emergency Fund, 2003).

2.5 Risk Factors Utilized for this Study

There are many risk factors for low-birth weight. However, this study evolved on behavioral risk factors and environmental risk factors to determine the status of low-birth weight among clients in the WIC program. Those risk factors are 1) access to and quality of prenatal care; 2) prenatal smoking, drinking, and substance abuse, 3) nutritional status of the pregnant women in the program and 4) social support received by the clients. These specific risk factors were selected for the study because they are preventable and amenable to change. These risk factors are also the targets of change for
the WIC program at Southside Medical Center. It is also necessary to discuss the role of race and SES in understanding low-birth weight.

2.5.1 Access to and Quality of Prenatal Care

Prenatal care is one of the most widely used preventive health care services in the United States. Prenatal care has long been endorsed as a means to identify mothers at risk of delivering a preterm or growth-retarded infant and to provide an array of available medical, nutritional, and educational interventions intended to reduce the determinants and incidence of low-birth weight (Alexander and Korenbrot, 1995). Access to health care includes both access to health insurance coverage, access to providers, and access to facilities that render services (N.C.H.S., 2002). Some researchers have suggested that women at greatest risk of poor pregnancy outcomes had less improvement in their access to and use of prenatal care (Misra and Guyer, 1998).

Nevertheless, the evidence for the effectiveness of prenatal care remains equivocal, and health care and public health professionals are not in single accord regarding its primary purpose and effects. Research studies have found a relationship between prenatal care and low-birth weight. The mothers who initiate prenatal care early are likely to have a lower risk of very low-birth weight births, as they are approaching full term (Alexander and Kotelchuck, 2001).

2.5.2 Smoking

Babies born to mothers who smoke during pregnancy are at greatly elevated risk of low-birth weight, a finding documented in birth certificate data as well as in numerous other studies. Cyanide found in cigarette smoke adversely affect maternal-fetal hemodynamics. Intrauterine growth retardation (IGR) is the primary cause for low-birth weight
weight infants exposed to maternal smoking (Curet and Hsi, 2002). Smoking is a major preventable risk factor for low-birth weight (IOM, 1985).

Some studies have suggested that smoking may be under-reported on birth certificates due to a variety of factors, including the lack of a specific time reference for smoking status, variations in the source of this information for each birth, and the growing stigma associated with smoking. Nevertheless, trends in maternal smoking based on the birth certificate are generally consistent with those reported for recent years from the National Survey of Family Growth and more recently from the Centers for Disease Control and Prevention’s (CDC) Behavioral Risk Factor Surveillance System (BRFSS), (Martin, Hamilton, Ventura, Menacker, and Park, 2002).

A report of the Surgeon General concluded that maternal smoking during pregnancy reduces birth weight by an average of two grams, doubles the chance of an infant having low-birth weight, and is responsible for 17% to 26% of low-weight babies (less than 2500 grams). Cigarette smoking has been identified as the single largest modifiable risk factor for low-birth weight (Ringle and Evans, 2001).

For most women, the decision of whether to continue to smoke is made early in the pregnancy. Studies have shown that approximately 39% of women who smoked before pregnancy quit smoking while they are pregnant, with nearly 70% of this group stopping as soon as they find out they are pregnant (Ringel and Evans, 2001).

In 1998, 12.0 percent of births to smokers compared with 7.2 percent of births to nonsmokers weighed less than 2,500 grams (5 lbs, 8 oz) (Ventura, Martin, Curtin, Park, and Park, 2000). Cigarette smoking during pregnancy declined in 1998, to 12.9 percent. The overall rate has fallen steadily since 1989. However, tobacco use by pregnant
teenagers continued to increase in 1998. Sizeable increases were reported for non-Hispanic black teenagers. Overall smoking rates remain lowest for non-Hispanic black, Hispanic, and Asian or Pacific Islander women. Cyanide found in cigarette smoke adversely affect maternal-fetal hemodynamics. Intrauterine growth retardation (IGR) is the primary cause for low-birth weight infants exposed to maternal smoking (Curet and Hsi, 2002).

In a study performed by Ventura and others, it was shown that smoking rates by maternal educational attainment continue to be highest for women with 9-11 years of education, 26 percent in 1998, and lowest for women with 4 years or more of college, 2 percent. Even among women aged 20 years and over, smoking rates were highest for mothers who attended but did not graduate from high school - 29 percent overall and 16.2 percent of non-Hispanic white women and 9.6 percent for African-American women (Ventura, Hamilton, Mathews, and Chandra, 2003). In 2003, the rate of smoking for non-Hispanic white women during pregnancy was 14.5 percent; and 8.5 African-American women (Hamilton, Martin, Sutton, 2004).

2.5.3 Prenatal Drinking

Pregnancy and birth outcome can be jeopardized by maternal alcohol use during pregnancy. Even low to moderate alcohol use has been shown to jeopardize birth outcome, independent of other risk factors such as tobacco use and other maternal risk factors (Ventura, Martin, Curtin, Menacker, and Hamilton, 2001). Perinatal alcohol exposure increases the risk of low-birth weight, developmental and behavioral abnormalities, spontaneous abortion, and stillbirth (Ventura, Martin, Curtin, Menacker, and Hamilton, 2001). Intake of one or more alcoholic drinks per day during pregnancy,
has consistently been shown to be associated with preterm birth and intrauterine growth restriction. Still, the question of whether there is a safe level of drinking during pregnancy remains controversial (Kesmodel, Wisborg, Olsen, Henriksen, and Niels, 2002). The Behavioral Risk Factor Surveillance System (B.R.F.S.S) found that approximately 10 percent of women used alcohol during pregnancy in 2002, and approximately 2 percent engaged in binge drinking or frequent use of alcohol (MMWR, 2004).

Alcohol use during pregnancy is substantially under reported on the birth certificate. According to birth certificate data, alcohol use declined again in 1998 to just 1.1 percent of mothers reporting any alcohol use compared with 1.2 percent in 1997 and 4.1 percent in 1989, the first year this information was reported on the birth certificates (Ventura, Martin, Curtin, Park, and Park, 2000).

Chasnoff and others (Chasnoff, Neuman, Thornton, and Callaghan, 2001) found that despite concern over the consequences of the adverse outcomes of pregnancy, alcohol was one of the most frequently missed diagnoses in perinatal medicine. Alcohol is mostly missed because legal, social, and attitudinal barriers often restrain open communication between physician and patient. Physicians’ reluctance to screen pregnant women for alcohol use steams from a number of factors which include the physicians’ concerns and misconceptions about the liability and risks associated with treating pregnant alcohol users, a lack of knowledge about addiction and referral options, and a lack of physician confidence in treatment programs. In many cases, screening does not
occur because physicians assume that alcohol use is not prevalent among their patients (Chasnoff, Neuman, Thornton, and Callaghan, 2001).

2.5.4 Prenatal Substance Abuse

Substance abuse remains a public health problem in the United States among pregnant women. The impact of substance abuse on the health of women and pregnancy has only recently received adequate attention (Curet and Hsi, 2002).

A statewide study conducted in New Mexico by the Department of Health, showed that women of childbearing age reported high levels of marijuana use (14%) and hard drugs (7%) (Curet and Hsi, 2002). In another study, the Maternal Lifestyle Study (MLS), a multicenter, prospective, observational study initiated to better define the effects of exposure to illicit drugs during pregnancy of the mother, fetus and infant, confirmed many of the reported adverse social and serious medical perinatal complications of mothers exposed to cocaine or opiates during pregnancy (Bauer, Shankaran, Bada, Lester, Wright, Krause-Steinrauf, Smeriglio, Finnegan, Penelope, and Verter, 2002).

Low-birth weight, preterm delivery, and abruptio placentae occur more frequently among pregnant women who use cocaine. Other perinatal outcomes associated with maternal cocaine use include intestinal anomalies, intrauterine growth retardation, microcephaly, structural central nervous system abnormalities, urogenital malformations, and malformations of extremities, primarily related to the vasoconstrictive effects of cocaine on the fetal circulation. Impaired mother and orientation regulation, abnormal
sleep patterns, poor sucking behavior, and increase tremors are common in the newborn period (Curet and Hsi, 2002).

As evidenced in the literature, pregnant women often continue to smoke, drink, and use other drugs. Stopping these risky health behaviors before the third trimester is most often accompanied by normal fetal growth. However, most women continue these habits because advice to cut down or to stop is often given when most women are unable to quit or are unwilling to do so. There are not many health or substance programs or public health interventions that target these behaviors. African-American women are often confronted with many stressors in life, and turn to risky health behaviors in order to cope with their day to day activities and responsibilities.

2.5.5 Nutritional Status of Pregnant Women

It has long been recognized that pregnant and lactating women form one of the most vulnerable segments of the population from a nutrition point of view. The ill effects of maternal malnutrition affect not only the mother but also her offspring. Pregnant and lactating women have to meet their own nutrition requirements and also supply nutrients to the growing fetus and the infant; poor dietary intake in these women will have adverse effects on the health and nutritional status of both mother and her infant.

Maternal nutrition, encompassing maternal dietary intake, circulating concentrations, uteroplacental blood flow, and nutrient transfer across the placenta, influences birth weight (Stephenson and Symonds, 2002). Some studies indicate that nearly 30% of women who deliver babies with a low-birth weight suffer from eating disorders (Stephenson and Symonds, 2002). Pregnant women receive nutrition education messages from health care providers, family members, and popular magazines, all of
which encourage them to eat healthy diets (Stephenson and Symonds, 2002). However, data on the foods women consume are lacking also in the literature, because of the small numbers of pregnant women who are included in national surveys and the limited amount of dietary information that is collected in most large epidemiologic studies. In reviewing the literature on pregnancy and nutrition, it was found that of the pregnancy outcomes that might be affected by maternal nutrition, the one encountered most often in the review of research is low-birth weight. Maternal nutrition consists of factors such as prepregnancy weight-for-height and gestational weight gain, as well as the intake of protein, vitamins and minerals.

In humans, little is known about how nutrient intake in early pregnancy is related to placental and fetal size. Whereas, nutrient intakes in late pregnancy have been reported to have inconsistent effects on fetal size, the relation to placental size is largely unknown (Godfrey, Robinson, Barker, Osmond, and Cox, 1996).

In 1996, a study by Godfrey and others, examined how the nutrient intakes in the pregnancy of an unselected group of mothers delivering at term are related to placental and fetal size at birth. A food frequency questionnaire was administered to assess nutrient intakes over the first trimester and repeated in late pregnancy. It was found that placental and fetal size at birth was associated with the mother’s intake of carbohydrates and protein. However, carbohydrate intakes in early pregnancy were associated with low placental weights and birth weights (Godfrey, Robinson, Barker, and Osmond, 1996).

In late pregnancy, low intakes of dairy protein in relation to carbohydrate were also associated with low placental weight. In a follow-up study pertaining to this research, it was found that babies in this survey, now 40 years old, showed that low
maternal intakes of animal protein in relation to carbohydrates led to decrease placental size. It was also found that low intakes of meat protein in late pregnancy were associated with lower birth weight. High protein intakes in late pregnancy have been associated with both positive and negative effects on birth weight (Godfrey, Robinson, Baker, Osmond, and Cox, 1996).

A study was performed using data from a prospective cohort study of risk factors for preterm birth, using lower to middle income women from four prenatal care clinics in two North Carolina settings. The purpose of the study was to identify foods that contributed most to nutrient and fiber intake during pregnancy. Dietary information during the second trimester was collected with the use of a food frequency questionnaire. The study found that overall, low nutrient-dense foods were major contributors to energy, fat, and carbohydrates, whereas fortified foods were important sources of iron, folate, and vitamin C. The median dietary intakes of iron were below the recommended levels. African-American women consumed more calories on average. After energy adjustments, white women consumed greater amounts of protein, iron, folate, and fiber (Siega-Riz, Bodnar, and Savitz, 2002).

2.5.6 Social Support

In this model, the resource mothers at Southside Medical Center’s WIC Clinic are helping the young mothers to improve and acquire social support and social networks to help them deal with their pregnancies and the responsibilities of being a mother. This social support and social networks ensures the mothers that they are not alone and someone is always there for them to provide emotional support (the provision of empathy, love, trust, and caring); instrumental support (the provision of tangible aid and
services that directly assist a person in need); informational support (the provision of advice, suggestions, and information that a person can use in addressing problems); and appraisal support (the provision of information that is useful for self-evaluation purposes and constructive feedback). These types of support are the basic components of the social networks and social support described by Heaney and Israel, 1997.

According to Israel (1982) and Israel and Rounds (1987), the term social network refers to a person-centered web of social relationships. Social support is always intended by the sender to be helpful, thus distinguishing it from intentional negative interactions. Whether or not the intended support is perceived or experienced as helpful by the receiver is an empirical question, and indeed, negative perceptions and consequences of well-intended interpersonal exchanges have been identified (Heaney and Israel, 1997).

Social Support also helps young mothers build self-esteem and self-efficacy, while reinforcing and modeling behavior. Many behaviors can be learned through modeling. According to Bandura (1977) four conditions are necessary before an individual can successfully model the behavior of someone else: (1) attention; (2) retention; (3) motor reproduction; and (4) motivation. Modeling teaches new behaviors, influences the frequency of previously learned behaviors, may encourage previously forbidden behaviors; and increases the frequency of similar behaviors (Bandura, 1977).

A person’s self-efficacy develops as a result of history and achievement in a particular area, from the observation of others successes and failures, from the persuasions of others, and from one’s own physiological state (such as emotional arousal, nervousness, or anxiety) while performing a behavior (Bandura, 1977). Social comparison of one’s own performance with the performance of others, especially peers or
siblings, also serves as a strong source of self-efficacy. In addition, if a person feels they are capable of achieving a goal, they are likely to work harder and give up less easily compared to a person who has low self-efficacy. A person’s self-efficacy for a given behavior dramatically affects their self-motivation (Bandura, 1986).

2.6 Barriers to Care

Low-income families face barriers to the health care system because of poverty, stress, and inadequate living conditions. Barriers to access may be due to an inability to afford medical care (financial barriers), the way health care is organized (structured barriers), and patients’ inability to use health care services effectively (personal barriers) (Margolis, Lannon, Stevens, Harlan, Bordley, Carey, Leininger, Keyes, and Earp, 1996).

Access to health care is limited also by the availability of primary care physicians, and by the systems used by medical offices to provide preventive services. For example, the division of health care into well-child visits and short-term visits may lead to missed opportunities to provide preventive services. Personal barriers to health care include deficits in families’ knowledge and attitudes about health, and impediments to their ability to obtain needed health care; and services (Margolis, Lannon, Stevens, Harlan, Clayton, Bordley, Carey, Leininger, Keyes, and Earp, 1996).

Poor African-American women with less education have been highlighted as specific groups for which trends toward more favorable prenatal care use have lagged, particularly for intensive utilization of care. Furthermore, one report has suggested that the discrepancy of African Americans being late in seeking prenatal care; or not seeking
prenatal care at all has not changed over the last decade, a period when racial disparities in infant mortality continued to grow (C.D.C., 2000).

Access to health insurance is another problem that hinders African-American women from utilizing the health care system. In 1995, for each of the subpopulations of minority groups, women were more likely than white women to be uninsured. At least 30 percent of all groups of minority women, (expect Hispanics) reported direct, private, employer-based insurance coverage in 1990. Only 12 percent of black women 18 to 53 years of age reported indirect private health insurance coverage through a spouse. Thirty-seven percent of black, non-Hispanic women reported direct health insurance coverage. There were 40 percent of women who reported using public health insurance coverage (Margolis, Lannon, Stevens, Harlan, Bordley, Carey, Leininger, Keys, and Earp, 1996).

2.6.1 Access Issues for Hispanics

In comparing another racial and ethnic population, the Hispanic population faces greater access barriers to health care services than the rest of the United States. Half of the Hispanic population has no usual source of care as compared with 35% of Black, non-Hispanics and 25% of white, non-Hispanics (Quinn, Schoen, and Buatti, 2000). Thirty-one percent of Hispanics have not visited a doctor during the past year and 41% have not received any preventive care in the past year (Kemper, Cohen, and Dombkowski, 2004). From 1987 to 1998 the number of uninsured Hispanics doubled, reaching 11.2 million or one-fourth of all America’s uninsured (Quinn, Schoen, and Buatti, 2000). Currently 3.5 million Hispanic immigrants illegally reside in the United States. This population is less likely to seek medical care and/or health insurance
coverage for fear of deportation. Cultural barriers also affect Hispanics’ access to and use of medical care services. Language difficulties are considered to be a major barrier to medical care and threaten the quality of medical services when they are obtained (Ku and Matani, 2001).

2.6.2 African-American Beliefs and Health Care

The intergradations of primary care providers, community-based health organizations, and human service organizations have been a much larger issue. However, for African Americans, the problem is much greater. Trust is one of the central features of patient-physician relationships. Distrust by African Americans is thought to stem from the history of racial exploitation in the United States (Corbie-Smith, Thomas, and St. George, 2002). Among the African-American populations there exist perceptions and misperceptions of the health care system. These groups of people have good reasons to distrust the health care and public health systems. Trust is a defining element in any interpersonal relationship, but is particularly central to the patient-physician relationship (Pearson and Raeke, 2000)

The Tuskegee Syphilis Study continues to cast its long shadow on the contemporary relationship between African Americans and the biomedical community. Numerous reports have argued that the Tuskegee Syphilis Study is the most important reason why many African Americans distrust the institutions of medicine and public health. Such an interpretation neglects a critical historical point; the mistrust pre-dated public revelations about the Tuskegee study (Gamble, 1997).

African Americans’ fears about exploitation by the medical profession date back to the antebellum period. During that period of time, slaves and free African-American
people were used as subjects for dissection and medical experimentation (Savitt, 1982). Although physicians also used poor whites as subjects, they used African Americans far more often. It is not known to what extent African Americans continued to be used as unwilling subjects for experimentation and dissection in the years after emancipation. However, an examination of African-American folklore at the turn of the century makes it clear that African-American people believed that such practices persisted. Folktales are replete with references to night doctors, also called student doctors and Ku Klux Klan doctors. During a 1983 trip to the United States, French visitor Harriet Martineau found that African-American people lacked the power even to protect the graves of their dead. “In Baltimore the bodies of colored people exclusively are taken for dissection,” she remarked, “because the whites do not like to take their own, and the coloured people cannot resist” (Gamble, 1997). In her book, Night riders in Black Folk History, anthropologist Gladys-Marie Fry writes, “The term ‘night doctor’ (derived from the fact that victims were sought only at night) applies both to students of medicine, who supposedly stole cadavers from which to learn about body processes, and to professional thieves, who sold stolen bodies-living and dead-to physicians for medical research.” According to folk belief, these sinister characters would kidnap African-American people, usually at night and in urban areas, and take them to hospitals to be killed and used in experiments (Gamble, 1997).

Links have been made between Tuskegee, AIDS, and genocide. In September 1990, the article “AIDS: Is it Genocide?” appeared in Essence, a popular magazine for African-American women. The author noted: “As an increasing number of African Americans continue to sicken and die and as no cure for AIDS had been found some of
us are beginning to think the unthinkable: Could AIDS be a virus that was manufactured to erase large numbers of us? Are they trying to kill us with this disease?”

In other words, some members of the African American community see AIDS as part of a conspiracy to exterminate African Americans (Gamble, 1997).

African Americans’ distrust in the health care system and beliefs that their lives are devalued by the white society also influence their relationships with the medical profession. They perceive, at times correctly, that they are treated differently in the health care system solely because of their race, and such perceptions fuel mistrust of the medical profession (Gamble, 1997). There are many, many more stories about the mistreatment of African Americans in the health care and public health arena. However, with the past and current treatments received by African Americans in the health care and public health fields, no wonder so much distrust and fears are exhibited.

2.7 Prevention Strategies

The problem of low-birth weight is multifaceted; but from a public health perspective, the key goal is prevention of preterm birth. This goal cannot be achieved without a much better understanding what is known currently of the determinants of preterm delivery (Paneth, 1995). Low-birth weight can be addressed more reasonably by considering research and strategies that unite the individual, environmental, social and behavioral components of the low-birth weight equation.

2.7.1 Lay Health Advisor Programs

The Resource Mothers Program at Southside Medical Center is similar to the programs that utilize Community Health Workers, Outreach Educators, Community Health Advocates, Health Promoters, and others. Another term for the Resource Mother
is the Lay Health Advisor (LHA), who is an individual that is indigenous to the community and consents to be a link between community members and the service delivery system (Eng, Parker, and Harlan, 1997).

Theoretically, prevention efforts should influence the three key risk factors in this study. The three key risk factors for the study are preventable and amendable to change, those risk factors are 1) access to and quality of prenatal care; 2) prenatal smoking, drinking, and substance abuse, and 3) nutritional status of the pregnant women in the program. Prevention efforts are designed to enhance protective factors and move toward reversing or reducing known risk factors. Protective factors are those elements which reduce the potential for unhealthy health behaviors. The prevention strategies include general life skills training and training in skills to resist making unhealthy lifestyle choices. Most of the prevention strategies were designed with the critical areas for prevention: 1) family relationships; 2) peer relationships; and 3) the community environment. There are many intervention strategies for community health workers/lay health advisors. However, community health worker/lay health worker type intervention strategies for low-birth weight were not found.

There have been some successful lay health advisor programs. One strategy for the Lay Health Advisors (LHAs) was the North Carolina Breast Cancer Screening Program (NC-BCSP). The LHAs were a group of older, rural, African-American women who helped establish a countywide partnership with health care providers, agencies, and local communities. The purpose of the program was to increase the proportion of African American women reporting screening mammography, by enhancing the delivery of local screening services, reducing health system access barriers, and building on the efforts of
natural helpers. As a result of the LHA initiative, the local commissioners in one county pronounced October as Breast Cancer Awareness Month and read a proclamation on the county courthouse steps in a ceremony attended by 25 LHAs and approximately 50 African-American and white male and female citizens, including the mayor and county commissioners, local physicians, and courthouse workers (Earp, Viadro, Vincus, Altpeter, Flax, Mayne, and Eng, 1997).

The faculty at the University of North Carolina, School of Public Health, in partnership with agencies and individuals in a rural town in eastern North Carolina used the LHA model for Sexually Transmitted disease prevention through community involvement. The purpose of this program was to train African-American women to initiate discussion throughout the community and offer assistance according to a person’s stage of change; seeking care for STD symptoms; seeking screening for asymptomatic infections; and condom use. By building on the community’s strengths rather than its weaknesses, the program was able to sustain meaningful behavioral and social changes (Thomas, Eng, Clark, Robinson, and Blumenthal, 1998).

The Lay Health Advisors have also been utilized in an intervention strategy in the East Side Village Health Worker Partnership, Detroit, Michigan. The LHAs were used to improve individual and community health through social networks. Accomplishments were not limited to changes in individual-level behaviors. Village health workers described changes in individual-level behaviors; changes in existing organizations and the development of new organizations (Schulz, Israel, Becker, and Hollis, 1997).

The Camp Health Aide Program (CHAP), a lay health promotion program for migrant farm workers, was developed and has been implemented by the Midwest Migrant
Health Information Office (MMHIO) since 1985. To date, more than 250 migrant farm workers have been trained as camp health aides (CHAs) to provide health education, basic first aide, referrals for health and social services, and translation services for their friends, neighbors, and coworkers. CHAs are recruited from migrant labor camps and farm worker communities. CHAP has been able to increase farm worker access to primary health care, while facilitating leadership development and empowerment of individual farm workers through the experience of a lay health promoter (Booker, Robinson, Kay, Najera, and Stewart, 1997).

2.7.2 The Supplemental Food Program

Established in 1972, the Special Supplemental Food Program for Women, Infants, and Children (WIC) provides pregnant women with food vouchers, nutritional education, and referrals to other health and social services. This program increases rates of early prenatal care and reduces the frequency of low-birth weight infants (Kendal, Peterson, Manning, Xu, Neville, and Hogue, 2002). WIC is a federally funded food and nutritional education program for low-income and nutritionally at-risk pregnant, breastfeeding, and postpartum women, and children under age 5. The effects of the WIC program have been extensively evaluated, and the results have been mixed (Kendal, Peterson, Manning, Xu, Neville, and Hogue, 2002).

The purpose of the WIC is to improve the health of participants during critical times of growth and nutrition. WIC provides participants with nutrition screening and counseling, breastfeeding support, and referrals for health care, and social and community services. The WIC program increases rates of early prenatal care and reduces the frequency of low-birth weight infants. Health care cost savings for pregnant women
exceed the costs of their WIC benefits. WIC can refer clients to other programs. Cross-referrals with Medicaid for services and sharing of records are specifically encouraged. Also, WIC can refer clients to other programs. Cross-referrals with Medicaid for services and sharing of records are specifically encouraged (Kendal, Peterson, Manning, Xu, Neville, and Hogue, 2002).

A study on the WIC program incorporating data on children born between 1990 and 1996 to women taking part in the National Longitudinal Survey of Youth was performed. The study sought to estimate the impact on the birth weight of maternal participation in the program. In this study, the researchers controlled for bias by eliminating unmeasured characteristics affecting both program participation and birth outcomes. The results of the study revealed a significant positive association between WIC participation and birth weight (Kowaleski-Jones and Duncan, 2002).

The 1998 National Maternal and Infant Health Survey was used to consider the endogenous and exogenous deaths among infants of women participating in WIC and Medicaid during pregnancy and the infant’s first year. The results of the study showed that it is important to consider the net effect of WIC and Medicaid participation and to differentiate both the timing of program receipt and cause of death. Evidence suggests that WIC and Medicaid programs have beneficial effects for poor women and their infants (Moss and Carver, 1998).

In another study, data was used from linked Medicaid enrollment, Medicaid paid claims, and WIC participation files to birth certificates for children born in North Carolina in 1992. The purpose of the study was to examine the relationship of child participation in WIC to Medicaid costs and use of the health care services in North
Carolina. The study found that the health care needs of low-income children who participate in WIC may be better met, than those of low-income children not participating in WIC (Buescher, Horton, Devaney, Roholt, Lenihan, Whitmire, and Kotch, 2003).

WIC subjects whose infants were delivered at Wishard Memorial Hospital over 18 months, were reviewed with respect to age, education, race, substance habits, and trimester of entry into prenatal care, maternal weight gain, and status in the program. The purpose of the program was to compare the birth outcomes of pregnant women in the program. Nutritional and non-nutritional benefits to participation in the WIC program were confirmed. Women enrolled in the program were less likely to deliver a low birth weight infant. Multiple variables likely contribute to the poor outcomes for nonparticipants (Brown, Watkins, and Hiett, 1996).

In 1989 to 1995, a study was conducted not using WIC data, but the Natality Detail Files to conduct an analysis to assess the impact of taxes on smoking among different subpopulations. The study was used to determine if higher cigarette taxes would reduce smoking rates among pregnant women. The goal of the study was to introduce a tax hike of $0.55 per pack of cigarettes to help reduce maternal smoking by about 22%. Overall, the study found that a 10% increase in price would reduce smoking rates by 7%. Estimates for subpopulations suggested that nearly all would be very responsive to tax changes, including the subpopulations with the highest smoking rates.
The results of the study found that smoking rates among pregnant women are responsive to tax hikes (Ringel and Evans, 2001).

2.7.3 The Medicaid Program

Even though access to health care is a problem in the United States, there are some health care programs for low income disadvantaged individuals and families. The Medicaid Program, also referred to as Title XIX of the social security program, was enacted in 1956 to finance health care for the indigent. Medicaid is the primary source of health insurance for poor women of reproductive age (Shi, Singh, Samuels, Cochran, and Glover, 1998).

2.7.4 The Medicare Program

The Medicare Program, also referred to as Title XVIII of the Social Security Act, finances medical care for (1) persons 65 and over, (2) disabled individuals who are entitled to Social Security benefits, and (3) people who have end-stage renal disease (Shi, Singh, Samuels, Cochran, and Glover, 1998). The Medicaid and Medicare programs are now known as the Centers for Medicare and Medicaid Services (CMS).

2.7.5 The Military Health Services System

The United States Department of Defense operates the Military Health Services System (MHSS) to provide medical services to the active and retired members of the armed forces and their dependents. The Department of Veterans Affairs (VA) is an executive department of the United States government (Shi, Singh, Samuels, Cochran, and Glover, 1998). It includes the largest health services system under a unified management structure in the United States (Williams and Collins, 1995) with more than 173 hospitals, 501 clinics, and 133 nursing homes (Iglehart, 1996). The VA health care
system was originally established to treat veterans with war-related injuries and to help rehabilitate past servicemen with war-related injuries; and to help rehabilitate past servicemen with war-related disabilities. However, the system has been increasingly used by poor veterans with medical conditions unrelated to military service (Iglehart, 1996).

2.7.6 The State Children’s Health Insurance Program (CHIP)

The State Children’s Health Insurance Program (CHIP) was established in 1997, as Title XXI of the Social Security Act, and launched in 1998. The objective of the program is to reduce the number of uninsured children in the United States. The program grants to help create and expand insurance programs for low-income children (Shi, Singh, Samuels, Cochran, and Glover, 1998).

2.8 Summary

Low-birth weight is a public health problem that contributed to infant mortality more common in the United States than in most Western European nations. Most nations use low-birth weight as an indicator of growth, morbidity, and survival of the newborn. Some low-birth weight babies have poor neurosensory outcomes, poor cognitive and neuropsychological outcomes, problems with behavior and social competence, poor school performance and academic achievement, and adverse health outcomes as well as problems with poor growth attainment.

The theoretical framework for this study consists of individual, environmental, behavioral, and biological/medical risk factors. These risk factors contribute greatly to low-birth weight among infants. However, this study evolves around certain individual, environmental, and behavioral risk factors for low birth-weight. Those risk factors are
(1) access to and quality of prenatal care; (2) prenatal smoking, drinking, and substance abuse; (3) nutritional status of pregnant women in the program; and (4) social support received by the clients. These risk factors were selected because they are preventable and amenable to change.

Lay health advisor programs are prevention efforts designed to enhance protective factors and move towards reversing or reducing known risk factors. The literature shows that there have been some successful lay health advisor type programs. African Americans seem to adhere to programs of this nature.
3. Methodology

3.1 Research Design

The purpose of this research was to understand whether and how the Resource Mother’s Program influenced birth outcomes among low-income African-American women. This research was conducted by investigating the differences between low-birth weight infants born among African-American women who were unexposed to the Resource Mothers Program and those born to women who were exposed to the Resource Mothers Program in the Women, Infants, and Children (WIC) Program in Atlanta, Georgia. Both quantitative and qualitative research methods were utilized in this study. This chapter describes the methods for each type of data.

3.2 Quantitative Data

The quantitative research data was collected from two WIC clinics that were located at the Grady Memorial Hospital and the Southside Medical Center. The data used for the quantitative analysis was retrospective because the study compared the presence of a reported risk factor obtained from preexisting records. Stratified purposeful sampling was used for this portion of the research.

For this portion of the analysis, clients at the Southside WIC clinic represented those who were exposed to resource mothers, while clients at the Grady Memorial WIC clinic represented those who were not. Data used for this study were combined from
fiscal years 1999 and 2000. The fiscal years began in October and ended in September of each year. There was a total of 361 clients from the Southside Medical Center; and a total of 152 clients from the Grady Memorial Hospital WIC clinic. In all, the total population group analyzed for this study was 513. During this time period, all clients at Southside Medical Center were eligible to utilize the services of the resource mothers.

Data is submitted by each WIC clinic to a central office for processing and analysis. There are trained intake workers in each Georgia WIC location to collect information on the clients.

The data were housed in raw data files, which contained information on each WIC client, (using a WIC identification number) in the state of Georgia. Each clinic also had a unique identifier. The data files were named DU110General (records from Southside Medical Center); DU120General (records from Grady Memorial Hospital); and the StateGeneral (records from WIC clients all over the State of Georgia). There were many variables found within these three files (see Appendices, Table 3.2).

The DU110 files prepared by the state of Georgia’s WIC program identified all records submitted from the Southside Medical Center WIC Program. All records submitted by the Grady Memorial Hospital WIC Program were identified by the number DU120. The individual WIC clinic number for Southside Medical Center is 698. However, since Grady has more than one clinic, there were five numbers that identified patients seen at those clinics. Those numbers are 694, 695, 696, 697, 699, and 999. These numbers identify the clinic in which these patients were enrolled. In reviewing the state’s records, all those clients in DU110 data file and DU120 data file that had enrolled in other clinics were dropped from the analysis. Also, if a DU110 client was enrolled in
clinic DU120, they were dropped from the list, and the same procedure was followed for the DU120 clients. There were about 110 clients dropped from the list who were enrolled in another clinic. Of the 110 clients dropped from the list, 36 were from Southside, and 74 were from Grady. This represented 9.1% of the total number of clients at Southside; and 32.7% of the total number of patients at Grady, respectively.

3.2.1 Hypotheses for the Study

This study was designed to test the following null hypotheses. The level of significance for this study was established at priori a p<0.05. Consistent with the study’s research questions (see page 1) quantitative research hypotheses for this study were as follows:

1. There was no difference in the birth weight of infants born to mothers at Southside’s WIC clinic who were below the age of 20 years and those born to mothers at Grady Memorial’s WIC clinic who were below the age of 20 years.

2. There was no difference in the birth weight of infants born to mothers at Southside’s WIC Clinic who were between the ages of 20 to 34 years and those born to mothers at Grady Memorial’s WIC clinic who were between the ages of 20 to 34 years.

3. There was no difference in the birth weight of infants born to mothers at Southside’s WIC clinic who were 35 years or more and those born to mothers at Grady Memorial’s WIC clinic who were 35 years or more.

4. There was no difference in the birth weight of infants born to mothers who were baseline users of cigarettes versus those born to mothers who were non-users at the Southside and Grady Memorial WIC clinics.
5. There was no difference in the birth weight of infants born to mothers who were baseline users of street drugs versus those born to mothers who were non-users at the Southside and Grady Memorial WIC clinics.

6. There was no difference in the birth weight of infants born to mothers who were at high nutritional risk at baseline versus those born to mothers who were at normal risk at either the Southside Medical Center or Grady Memorial Hospital WIC clinics.

Data for this study were obtained from the state of Georgia’s WIC Program. All data regarding WIC patients in each clinic throughout the state of Georgia were collected utilizing a standardized form called the “Georgia WIC Program Turnaround Document” (see Appendices, Table C.1). The forms used to collect this information were the same for each clinic throughout the state of Georgia.

3.2.2 Review of Records

The researcher reviewed patient records at the Southside Medical Center’s WIC program, to determine if additional information could be recovered. There were two sets of records found at this clinic. One set of client records was housed in the file room for the entire WIC clinic, while the other set of records was stored in separate file boxes in an office for those patients being seen by resource mothers. Each resource mother had her own set of records stored in separate file boxes; these records were called the “resource mothers’ charts”.

In March, 2001, the researcher reviewed all records at the Southside Medical Center. This review of records called for reviewing each page in the client files. The researcher matched the records of the patients who were seen by the resource mothers
with the clinic’s WIC records and the state of Georgia’s raw data. It was found that 211 of the 361 Southside Medical Center WIC patients had medical charts that were designated for the resource mothers, for fiscal years 1999 and 2000. The records indicated that almost all of the 361 clients had some type of contact with the resource mothers. Every time a resource mother made contact with a client, that contact was noted in the client’s medical record. The data in the resource mothers’ charts and in the file room at Southside matched the records included in the WIC data set.

The data prepared by the State of Georgia’s WIC program was no different than the data found in the patients records. Also, after reviewing the charts kept by the resource mothers, it was difficult to determine exactly how many visits or contacts the clients had with the resource mothers. The records did not document exactly how many times the clients had seen the resource mothers.

The patients’ records at Southside were examined to collect quantitative data that might help to (1) better determine which clients were actually exposed to the resource mothers, and (2) to learn anything else about the setting that might help explain the quantitative findings from the WIC data set. It was found that some clients at Southside among other age categories had also received some type of assistance or had some contact with the resource mothers. When the Resource Mothers Program first began, the resource mothers were allowed to see all patients that came into the clinic regardless of their ages. Therefore, it was impossible to group the Southside clients into two categories for analysis (Southside WIC clients who were exposed to the Resource Mothers and Southside WIC clients who were unexposed to the Resource Mothers), during years 1999
and 2000. As such, being a client at Southside served as a proxy for being exposed to the Resource Mothers Program.

### 3.2.3 Variables for the Study

The main dependent variable was whether a mother gave birth to a normal or low (including very low) birth weight baby. The main predictor variable was maternal prenatal exposure to the Resource Mothers Program at the Southside Medical Center’s WIC program. Independent variables were race/ethnicity, age, education, family size, family income, marital status, nutritional risk, alcohol use, cigarette use, street drug use.

Variables that were unavailable were preterm birth, intrauterine growth retardation, timing of prenatal care (started early in TI), low pre-pregnancy weight, low weight gain (BMI-specific targets), vaginal infections, domestic violence, short inter-pregnancy interval, psychosocial stress, and chronic conditions. The study did not use the variable multiple gestation because the analysis was limited to singleton births. A list of variables included in the data set were clinic number, lagency (Southside or Grady), low birth weight, WIC identification, WIC type (type of service being received), year, pregnancy outcome, priority (reason the client was certified to be eligible)

### Variables

<table>
<thead>
<tr>
<th>(Obtained from the WIC files)</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resource Mothers</td>
<td>1</td>
<td>(Exposed to Resource Mothers)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>(Unexposed to Resource Mothers)</td>
</tr>
<tr>
<td>Age</td>
<td>1</td>
<td>(Less than 20 years)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>(20 - 34 years)</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>(35 + years)</td>
</tr>
<tr>
<td>Race</td>
<td>1</td>
<td>(Black-Non Hispanic)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>(Hispanic)</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>(All Others)</td>
</tr>
</tbody>
</table>

70
<table>
<thead>
<tr>
<th>Variable</th>
<th>Value 1</th>
<th>Value 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>High School or Less</td>
<td>Some College or More</td>
</tr>
<tr>
<td>Financial Status</td>
<td>&lt;$1,500 per month</td>
<td>&gt;$1,500 per month</td>
</tr>
<tr>
<td>Family Size</td>
<td>1 - 3 in Family</td>
<td>4 + in Family</td>
</tr>
<tr>
<td>Marital Status</td>
<td>Married</td>
<td>Not Married</td>
</tr>
<tr>
<td>Alcohol Use</td>
<td>No Alcohol</td>
<td>Any Alcohol</td>
</tr>
<tr>
<td>Cigarette Use</td>
<td>No Cigarettes</td>
<td>Any Cigarettes</td>
</tr>
<tr>
<td>Street Drug Use</td>
<td>No Street Drugs</td>
<td>Any Street Drugs</td>
</tr>
<tr>
<td>Nutritional Risk</td>
<td>High Risk</td>
<td>Low Risk</td>
</tr>
</tbody>
</table>

Figure 3.1: Independent variables used for the Study

for the program), low birth weight, infant weight, race, sex, weight, age, education, the program), low birth weight, infant weight, race, sex, weight, age, education, family size, family income, marital status, nutritional risk, cigarette use, alcohol use, and drug use. The variables were renamed and recoded into the SAS data set. The variable age was recoded as age 20 years and below, 20 to 34 years, and 35 years and older. Race was recoded as black/non-Hispanic, Hispanic and all others. Educational level was recoded as high school graduate or less and some college or more. Income was coded as $1,500 per month and below and $1,500 per month and higher. Family size was recoded as 1 to 3 members in the family and more than 4 members in the family. Marital status was recoded as married and not married. Alcohol use was recoded as no alcohol and any alcohol. Cigarette use was recoded as no cigarettes and any cigarettes. Drug use was
recoded as no street drugs and street drug use. Nutritional status was recoded as high risk (malnutrition) and normal risk (no malnutrition).

The patients’ records at the WIC clinics were used as the baseline for all the variables. The variables were obtained from an existing data set obtained from the State of Georgia’s WIC Program. The variables for this study are listed on page 74.

3.2.4 Preparation of Data

In order to prepare for the data analysis with the data set established from the state of Georgia’s data files, access software tables had to be converted into the SAS software files. Three access tables for each year of the analysis had to be converted (imported) into a SAS data set. The SAS data set had to be recoded into interim data sets, and merged into new files. The access tables that had to be recoded and merged were the state medical access raw data sets, the state infant access raw data sets and the state general access raw data sets for years 1999 and 2000. A SAS format library had to be created to label variable values in the output using SAS programs. Descriptive tables of risk factors and pregnancy outcomes had to be created using SAS programs.

3.2.5 Missing Data among State Records

In preparing the data sets from the raw WIC data, it was found that there were missing data for some of the variables in the study (see Appendices, Table D.2). The variables that contained missing data were education, alcohol use, and tobacco use. There were 71 missing responses from Grady for education; and 136 missing responses for Southside. Grady had 8 missing responses for alcohol use, and 8 missing responses for cigarette use (see Appendices, Table D.2). Two clients at Southside reported that they used alcohol; while there were no reports of alcohol use at Grady (see Appendices,
Table D.5). As a result it was necessary to perform the multivariate analyses with and without the education variable to ascertain whether missingness was reflected in the results.

3.3  **Quantitative Data Analysis**

The quantitative data analysis consisted of univariate, bivariate, and multivariate analyses. These analyses are described below.

3.3.1  **Univariate Analysis**

Frequency distributions were prepared for all variables, shown in Table D.5. These distributions were designed to provide an overall assessment of the demographic features of the Southside, Grady, and entire Georgia populations; and the frequency of key behavioral risks in these populations that may affect birth weight.

3.3.2  **Bivariate Analysis**

An analysis of bivariate relationships of potential risk factors (including main exposure variable-resource mothers at Southside Medical Center) was performed for low-birth weight and normal-birth weight. Also, an analysis of bivariate relationships of potential risk factors was also performed for Grady (unexposed to resource mothers) that included low-birth weight and normal-birth weight.

The contingency tables were created to examine the relationship between the unadjusted mean infant weight among Black mothers who were exposed and unexposed to resource mothers by all the other variables and characteristics shown in Table D.9. The contingency tables provided a description of the WIC data set for Southside Medical Center, Grady Memorial Hospital and the entire state of Georgia. The contingency tables also provided an assessment of the potential risk factors for low birth weight. The
Yates-Corrected Chi-Square test for a 2 x 2 contingency table was performed. The Phi-Coefficient was used to measure the strength of the relationship between the variables. The Mantel-Haenszel chi-square was conducted to assess the association between birth weight and the exposure variable. The Fisher’s exact test computed the exact probability for each table and the p-value.

3.3.3 Multivariate Analysis

Logistic regression was used to study the effect of exposure to the Resource Mothers Program on the birth weight of infants among mothers at Southside, compared to the birth weight of infants at Grady whose mothers were not exposed to the Resource Mothers Program, while assessing the effects of all the other variables shown in Table D.13. The Statistical Analysis Software program (SAS), version 8-e for Windows, was used to perform the statistical analysis. The following data analysis was preformed on two subpopulations (low and normal birth weight). The analysis was conducted using exposure to resource mothers (Southside Medical Center) and unexposure to resource mothers (Grady Memorial Hospital). Data for years 1999 and 2000 were combined.

Logistic regression was used because the clients at Southside Medical Center and Grady Memorial Hospital WIC clinics and the other State WIC clinics were being classified into one of two populations (low plus very low birth weight and normal birth weight) and to decide which characteristics among those listed in Table D.13 were predictive of low birth weight. The analysis was applicable for any combination of discrete and continuous variables.

Logistic regression required knowledge of both the dependent (and outcome) variable and the independent (or predictor variables) (Rosner, 1995). The logistic
regression model included the exposure of interest, being born with low birth weight, and each potential confounding variable. These variables were screened in the logistic regression analysis using the frequency output to determine which ones were associated with the dichotomous outcome variable. The chi-square test of association was used to screen these variables to assess this association.

3.4 Qualitative Data Analysis

The qualitative analysis consisted of two types of data, interviews with the resource mothers and interviews with the clients. These observations were important, in helping to understand the roles and responsibilities of the resources mothers, how they relate to the patients, and more importantly if the resource mothers are an asset to the program.

Data analyses for the qualitative data (resource mother’s interviews, and client interviews) were conducted by utilizing a deductive approach. The researcher was interested in how the resource mothers and clients would respond during the interview. For the resource mothers, the intent was to determine what aspects of the program work well; what aspects of the program did not work well; to examine the role that the resource mothers played in the program, and to determine if the resource mothers had the same opinions towards the clients. These were the categories that were discussed during the interview: 1) how the resource mothers became involved in the program; 2) the resource mothers’ role in the program; 3) what the program was all about; 4) what
accomplishments the program had made; 5) how the program had benefited the patients; and 6) how the program could have been improved.

It was anticipated that the resource mothers would answer the questions in the following manner: (1) most resource mothers became involved in the program because they were previous WIC clients, employed by Southside Medical Center, or because they had heard about the program in the community and decided to join; (2) resource mothers provided social support to the pregnant women in the program; they assisted pregnant women with housing, food, clothing; and encouraged the clients to stay in school or to go to college; (3) the resource mothers allocated a large amount of time listening to their clients problems; (4) the clients were educated by giving them materials to read, attending classes, attending the RAP sessions; and just by listening to the advice of the resource mothers; (5) the resource mothers could have allocated more time with their clients if they had less paperwork to complete.

In order to properly examine the role of the resource mothers and their effectiveness as an alternative health service delivery practitioner, separate data collection methods were needed to fully capture the resource mothers experience and the complexity of their relationship with the patients, the community and the clinic. The study also examined the WIC clients to determine what they thought about the program, how they related to the resource mothers, if the program was beneficial; and also to determine if the program was a successful strategy in helping to increase the utilization rate of the clinic.

Before the interviews with the clients were conducted, several assumptions were made as to how the clients would respond during the interviews. It was anticipated that
the clients would respond to the interview in the following manner: (1) most of the clients resided in the community; (2) the clients would feel that the resource mothers’ were an asset to the community; (3) the resource mothers provided the clients with social support; (4) the clinic educated the clients on how to be healthy while pregnant; (5) the clinic helped these clients to improve their health behaviors.

The information from the resource mother and client interviews was analyzed using the CDC EZ-Text software. EZ-Text is a qualitative software tool designed to assist researchers in creating, managing, and analyzing qualitative databases (Carey, Morgan, and Oxtoby, 1997). EZ-Text was used by the researcher to manage the data, create a database, create a codebook, and code the data. The software EZ-Text was also used to identify themes that were common among the clients and resource mothers. These themes were used in the qualitative results section to determine how the clients and resource mothers felt about the program; and to find out what the program was all about.

3.4.1 Qualitative Data

Interviewing and observational techniques were used as methods of collecting and analyzing empirical materials. The methods of collecting data were open-ended interviews, and observations. Clients who participated in the study were asked to participate during their visit to the clinic or were telephoned by a resource mother and asked to participate in the study.

An attempt was made to interview clients at the Grady Memorial Hospital’s WIC clinic. Grady’s administrators had given approval for the clients to be interviewed for the study. However, on the day before the interviews were to begin at Grady, the supervisor of the WIC clinic stated that the hospital administrators had decided to withdraw their
approval for the study to be conducted with the WIC clients. The Grady officials had made this decision because the compliance date for the Privacy Standards, under the Health Insurance Portability and Accountability Act (HIPAA), was effective as of April 14, 2003. It requires patients’ medical information to be protected. The U. S. Department of Health and Human Services enacted the HIPAA privacy law regulations, which became effective April 14, 2003, to establish standards and requirements for the maintenance and transmission of health care information (Brief History of the HIPAA Act, 2003).

3.4.2 Interviews with Resource Mothers

An interview guide (see Appendices, Table A.2) was used to interview four resource mothers at the Southside Medical Center’s WIC clinic. The interview guide for the resource mothers was pretested on two subjects at the Southside Medical Center who were involved with the resource mothers’ program, and were familiar with the activities that were involved with the program. These semi-structured interview guides were prepared in order to assure that the same information was obtained from all resource mothers who were interviewed. The interview guides also allowed the researcher to develop questions, sequence the questions, and make decisions regarding which information needed to be pursued further.

In qualitative research, interviewing is flexible, iterative, and continuous, rather than prepared in advance and locked in order or words. A semi-structured interview guide is a general plan of inquiry, but not a specific set of questions that must be asked in particular words and order. A qualitative interview is essentially a conversation in which
the interviewer establishes a general direction for the conversation and pursues specific topics raised by the respondent (Babbie, 1998).

Experts reviewed the interview guide before it was administered. The experts who reviewed the instrument consisted of a researcher with experience in qualitative methods, college instructor, Kenneth Steinman, Ph.D.; a health educator, Sharla Willis, Ph.D., an expert familiar with qualitative data in maternal and child health; and a health educator and nutritionist Laverne S. Montgomery, M.A., R.D., L.D., who worked with communities and community health workers and was very familiar with interview guides and research in communities of this nature.

The interview guide was also pilot tested on three staff members in the WIC clinic. Experts and pilot test respondents both found that the guide contained too many questions. Therefore, some questions were omitted from the guide. The experts also advised the researcher not to ask the resource mothers background questions.

3.4.3 The Recruitment of Resource Mothers

During the period of time that this research was conducted, there were five resource mothers involved in the program. There were interviews conducted with four of the five resource mothers. The fifth resource mother was not interviewed because she was fairly new to the program and was not as actively involved as the others. These resource mothers were recruited for their interview during a monthly RAP Session held by Southside’s WIC clinic. The resource mothers were told that they would be informed
and reminded of the location of the interview, the time of the interview, and the day of
the interview. The method of sampling used was stratified purposeful sampling.

The resource mothers were read a “recruitment script” (see Appendices, Table
C.3). The script informed the resource mothers about the project and the purpose of
conducting interviews with them. The script introduced Dr. Moon Chen (previous
dissertation chairman) as the investigator of the project, and Karen Bouye as the
co-investigator. During the script, the resource mothers were informed that the
researcher wanted to audiotape their interview session, but needed their permission.
Confidentiality, anonymity, and informed consent were also discussed at that time. The
resource mothers were told that their names would be kept confidential and that their
interview would in no way be associated with their name or connected with them. They
were asked if they would agree to participate in the study.

The resource mothers were recruited on a voluntary basis, and were asked for
permission to audiotape their interviews. They were advised of the purpose of the study,
the role that confidentiality played in the study, and the time frame of the interviews. The
researcher also discussed and read the consent form (see Appendices, Table C.4) to the
resource mothers while the resource mothers reviewed the form as well. The resource
mothers were asked if they understood the consent form and if they had any questions
about the form or the interviews. At that point, the resource mothers were asked to
indicate their consent to participate in the study by signing the “consent form” and for the interview to be audio taped.

3.4.4 Resource Mothers’ Interview

The study involved conducting individual interviews with the resource mothers. The first interview was unstructured and in depth; it gave the researcher an opportunity to determine how to structure the other interviews that were to be conducted. The last three interviews were more structured, in order to determine if common themes emerged among the respondents. These interviews were held in a private office at the Southside Medical Center, and lasted from 20-30 minutes. These interviews contributed to understanding what the resource mothers were accomplishing and the attitudes and feelings they expressed towards their work. Interviewing the resource mothers also provided an opportunity to find out exactly what they did, what their job responsibilities consisted of, and exactly how they interacted and related with the clients. The interviews with the resource mothers were organized around the questions presented in the appendices, Table A.2.

Additional probing questions elicited more information from respondents during the interviews. At the end of each session, the participants were given a chance to add comments to their transcript. After each interview, the resource mother who participated in the study received a key chain and was thanked for participating.

At the beginning of the interview, the resource mothers were read an introduction (see Appendices, Table A.2), which thanked them for agreeing to participate in the study, discussed the formalities of the questions, assured them of confidentiality, and let them know that their participation was voluntary and that they could withdraw from the
interview at any time. After the introduction was read, the resource mothers were asked to sign a “Consent for Participation in Social and Behavioral Research” form. This form contained the resource mothers’ signatures for not only their consent to participate in the study; but also for the resource mothers’ permission to audiotape the interview. Each interview session with the resource mothers was audiotaped. The interviews were held in an office space at the Southside Medical Center’s WIC program. Most of the interviews were held after lunch when the resource mothers had more down time. Only one interview was conducted before lunch. As an incentive, a key chain was given to all resource mothers who were interviewed.

3.4.5 Interviews with Clients at Southside

A semi-structured interview guide (see Appendices, Table A.3) was prepared for interviews with clients at the Southside Medical Center’s WIC clinic. The interview guide was reviewed by experts and pretested. The experts who reviewed the guide were Kenneth Steinman, Ph.D., Sharla Willis, Ph.D., and Laverne S. Montgomery, M.A., R.D., L.D.

The interview guide was administered as a pretest at the clinic on ten clients who had never received services from the resource mothers. Because some of the clients felt that the questions were too long and they did not know how to adequately respond to some of them, the interview guide was revised. Additional questions were added to the guide because of the clients’ responses to the questions.

There were 40 clients interviewed at Southside Medical Center using the semi-structured interview guide. Of the 40 clients interviewed, 20 clients were involved in the Resource Mothers Program and 20 were not. The 20 clients who were seen by the
resource mothers were between the ages of 18 through 20. Those clients who were not seen by resource mothers were between the ages of 18 through 26. It was necessary to interview these clients to determine if the Resource Mothers Program had helped the clients to better access the health care systems, to improve their diets; and to decrease or eliminate their smoking, drinking, and street drug use.

3.4.6 Recruitment of the Clients at Southside

The clients at the Southside Medical Center were recruited for the study as they entered the clinic, or they were recruited by a resource mother over the telephone and scheduled to visit the clinic. If clients were recruited by telephone, the resource mothers would also contact them the day before their interview to remind them of their appointment. The clients were recruited on a voluntary basis. The type of sampling method used was stratified purposeful sampling. In recruiting the clients for the study, they were briefed on the purpose of the study, the role of the interviewer, the expected time frame of the interview, and the need to audiotape the interview. Not one patient at the Southside Medical Center refused to be interviewed. Each patient asked to participate in the study, did so willingly.

Before the interviews began, the clients were read a script (see Appendices, Table C.5). The script informed the clients about the project, the purpose of the project, and the length of the interviews. Also, the script informed the clients about interviews being audio taped and the need for the patient to sign the consent form; giving permission to conduct the interview and tape the session. The script introduced Kenneth J. Steinman, dissertation committee chairman and Karen Bouye, doctoral candidate. Confidentiality,
anonymity, and informed consent were also discussed at that time. The clients were asked if they would agree to participate in the study.

3.4.7 Clients’ Interviews at the Southside Medical Center

The interviews with the clients at Southside Medical Center were held in an office within the WIC suite, behind closed doors. All interview sessions were audio taped, and all consent forms were signed. Most interviews lasted from 20 to 30 minutes. After each interview was conducted, the client received $10.00 as a token for allowing us to utilize their time.

The clients interviewed resided in the community, or had other relatives that had previously utilized the services of the WIC clinic. Most of the clients were either in high school at age 18 and older or had dropped out during the eleventh grade of high school. Some of the clients were high school graduates or were in the first years of college or trade school. Also, most of the clients did reside at home with their parents, family members, friends, or lived in their own apartment. Beginning in 2001, the Southside Medical Center’s WIC clinic’s Resource Mothers Program enrolled only teenagers between the ages of 14 years and 20 years. However, some patients were as young as 11 years old and were eligible for the program. The interviews with the WIC clients were organized around the questions presented in the appendices, Table A.3.

As with the interviews with the resource mothers, the first three interviews were unstructured and gave the researcher an opportunity to determine how to structure the
other interviews that were to be conducted. All other interviews were more structured, and common theses emerged among the clients.

3.4.8 Observational Methods

In order to better understand the Resource Mothers’ Program and the functions of the WIC clinic, observations of the WIC clinics at Southside and Grady, the staff meetings at Southside and at the RAP sessions at Southside were made. The observations focused on the social interactions and relations within the clinic, at the staff meetings, and at the RAP Sessions. These observations were made in order to validate and cross check findings.

During the observations of the WIC clinics at Southside and Grady, the clinic directors were the only ones who were aware that the researcher was making observations. The clinics were observed for four days, during clinic hours. The purpose of these observations was to observe the operations of the clinic, the activities that take place in the clinic, the reactions, interactions and responses of the staff and clients.

The staff meetings at the Southside Medical Center were observed in order to understand more about the program, the setting, responsibilities of the staff, and how the staff members relate with one another. These observations were also made to understand how the program operates; and to just discover different things about the people involved with the clinic, and the clinic itself. The meetings were very informative and showed how the resource mothers worked well within and outside the clinic. Each resource
mother participated in the discussion and reported their case load and the events that centered on their work with the clients.

The three RAP sessions at the Southside Medical Center were observed to obtain a clear understand of exactly how the resource mothers, the clients, and families of the clients relate with each other; and to determine exactly what happens at these sessions. These sessions provided a great learning experience for the clients and their families. At each session, the researcher was introduced and spoke to the crowd about the research. Each session was centered around a guest speaker, who spoke on an important issue regarding improving pregnancy outcomes, threats to pregnancy or health behaviors. Also, the resource mothers spoke about different health behaviors such as alcohol, drugs, and tobacco use. Some resource mothers also spoke about condom use and safe sex. The manner in which these resource mothers spoke to the crowd was amazing. One resource mother was a very dynamic speaker.

An agenda was prepared for each session. The sessions not only targeted the clients, but their families and friends as well. Gifts and prizes were distributed at each session. The clients, their families and friends were made to feel very comfortable by the manner in which the sessions were handled. After the sessions, food and drinks were served to the participants. Handwritten notes were also prepared for each observational method, but the data was not analyzed for this study.

3.5 Validity and Reliability of Qualitative Data

The three credibility issues for qualitative inquiry were addressed in this study. The researcher was trained and made rigorous preparation for observing the clinics, attending the staff meetings, and RAP sessions. The researcher prepared for scientific
inquiry in taking two years of coursework at the Ohio State University. Much of the researcher’s coursework consisted of qualitative methods and hands on experience in becoming a skilled observer, interviewer, and qualitative researcher. The qualitative research experience was obtained not only in the School of Public Health at Ohio State University, but also in the School of Education. The researcher has participated in research projects at the Centers for Disease Control and Prevention in Atlanta, Georgia.

Many techniques and methods were used to gather the data for this research. This study used both quantitative and qualitative methods. The data for the study was carefully analyzed. Assumptions about the study were prepared before the analysis was performed. In order to investigate the role that the resource mothers play in the program, basic research was done using descriptive methods. Triangulation was used to compare the consistency of the quantitative data, views expressed by the clients, resource mothers, and WIC staff, comparing the perspectives of the different people involved with the program. The researcher tried to remain neutral and impartial to this research project.

Qualitative inquiry strategies were used that emphasized several interconnected themes. Naturalistic inquiry was used, which is a discovery-oriented approach that minimizes investigator manipulation of the study setting and places no prior constraints on what the outcomes of the research will be (Patton, M.Q., 1990).

3.6 Basic Assumptions

The following basic assumptions were made in this study: 1) it was assumed that the data for the quantitative analysis obtained from the State of Georgia’s WIC Program were accurate and representative of the client’s enrolled in the program; 2) it was assumed that there are accurate reports of what the data claims to report, since the study
used an existing data set in regards to the quantitative analysis; 3) it was assumed that the answers given by the resource mothers for the qualitative data analysis were accurate and honest representations of the respondents’ perceptions.

These assumptions were fair because after reviewing the 211 charts at Southside, the information provided in the patients’ charts was found to be accurate. These 211 charts at Southside also reported the same data as the data sets.

3.7 Summary

This study was conducted to understand whether and how the Resource Mothers’ Program at the Southside Medical Center WIC Clinic influenced birth outcomes among low-income African-American women. Qualitative and quantitative methods were used to compare the Southside WIC Clinic (exposed to resource mothers) with the Grady Memorial Hospital WIC Clinic (unexposed to resource mothers).

Quantitative data for this study was obtained from a WIC data set from the state of Georgia. The data set contained 71 missing responses from Grady for education; and 136 missing responses for Southside. Logistic regression was used to determine which characteristics were predictive of low-birth weight.

The qualitative analysis consisted of interviews with the resource mothers and interviews with the clients. EZ-Text software was used for the qualitative analyses. The software was used to code data, develop a code-book, and to select common themes among the clients.
CHAPTER 4

4. Results

4.1 Quantitative Analysis for Southside Medical Center and Grady Memorial Hospital WIC Clinics

This chapter presents quantitative analysis to address the research questions (see page 1) and the specific research hypotheses (see pages 2 and 3). For this study, the total sample of WIC clients (n = 513) included two groups, women at the Southside Medical Center’s WIC Clinic (n = 361) and women at the Grady Memorial Hospital’s WIC Clinic (n = 152). The clients at the Southside WIC clinic were exposed to the Resource Mothers Program; while those at the Grady WIC Clinic were not exposed to the Resource Mothers Program. Of the babies born to women at the Southside WIC clinic, 15.5% (n = 56) were either low (or very low) birth weight. At the Grady WIC clinic, 20.4% (n = 31) of the infants born to the women in the program had either low or very low-birth weight (see Appendices, Table D.1).

4.2 Missing Data for the Study

There were a large number of missing responses for educational status at both Southside (136) and Grady (71). While there were no other missing values for any other variables for Southside, Grady had a few other missing responses for some variables, including 1 missing response for marital status, 2 for nutritional risk, 8 for alcohol use, and 8 for cigarette use (see Appendices, Table D.2). Tables D.3 and D.4 in the appendices, respectively, show the proportion of missing data for educational status
among total women and black women for the different client characteristics. Because non-random missingness may affect the result of the multivariate analysis, it was necessary to examine how other variables related to missingness on the education variable. In this study, 62.6% (224) Black clients at Southside and 66.7% (64) Black clients at Grady reported data for educational status (see Appendices, Table D.3). There were only three Hispanic clients at Southside, of which one (33.3%) reported her educational status. At Grady, 29.1% (16) of the Hispanic clients reported their educational status. A large percent of clients below age 20 failed to respond to the question about their educational status at both clinics (Southside – 79%, Grady – 71%).

The table for “Missing Data for the Educational Status of Black Mothers” (see Appendices, Table D.4), showed that clients below age 20 years were also more likely to have missing data on educational status (Southside – 79.0%, Grady – 66.7%). Mothers who were living in households of 1 to 3 persons (see Appendices, Table D.3) were more likely to report their educational status (Southside – 65.7%, Grady – 57.9%), than those mothers living in households of 4 or more persons (Southside - 60.4%, Grady - 50.5%).

In Table D.3, in the appendices, clients with incomes of more than $1,500 per month at Southside were more likely to report their educational status (80.0%), than those clients with incomes less than $1,500 (60.7%) per month. However, at Grady, mothers with incomes greater than $1,500 were less likely to report their educational status (43.8%) than mothers with incomes less than $1,500 (54.4%). If the comparison is limited to Black mothers (see Appendices, Table D.4), 80.0% of Southside mothers with incomes greater than $1,500 reported their educational status, compared to 61.0% of mothers with an income less than $1,500. For Grady, an equal percent (66.7%) of
mothers, with an income greater than $1,500 and incomes less than $1,500 reported their educational status.

Table D.3, shows that unmarried women at both Southside (60.3%) and Grady (53.0%) were less likely to report their educational status, than married women (Southside - 84.0%, Grady 54.0%). Similarly, unmarried black mothers (see Appendices, Table D.4) were less likely to report their educational status (Southside – 60.4%, Grady – 62.7%), than married women (Southside – 86.7%, Grady – 91.7%).

Those mothers of high nutritional risk status at Southside were more unlikely to report their educational status (39.6%), than mothers with normal nutritional risk (31.9%). But at Grady, mothers who were of normal nutritional risk (46.2%) were almost equally as likely to report their educational status as mothers of high nutritional risk (46%). Black mothers (see Appendices, Table D.4) who were at high nutritional risk status at both Southside (60.6%) and Grady (64.0%) were less likely to report their educational status, than mothers at normal nutritional risk (Southside – 68.5%, Grady – 80.0%).

Missingness was most common among young Hispanics. At Grady, five of the six women who used street drugs were missing data on educational status. Of the 55 Hispanics at Grady, 34 had missing data on alcohol use. Also, 34 Hispanics had missing data on cigarette use (see Appendices, Table D.3).

4.3 **Multivariate Analyses**

Logistic regression was used to study the effect of exposure to the Resource Mothers Program on the birth weight of infants among mothers at Southside compared to the birth weight of infants at Grady among mothers not exposed to the Resource Mothers
Program, while controlling for potential confounding variables. The dependent variable, \( Y \), was coded one if the infant was low-birth weight and zero if they were not low-birth weight. The main predictor (independent) variable was maternal prenatal exposure to the Resource Mothers Program. This program was available to mothers at Southside, but not at Grady. Other independent (control) variables used in the models were race-ethnicity, education, marital status, street drug use, age, income, alcohol use, high risk status, family size and cigarette use.

The logistic regression models used for this study included: 1) the unadjusted odds ratio (each variable was entered into the model by itself; 2) Model 1, the forward selection model which assessed which explanatory variables had the greatest effect (included all variables except alcohol); 3) Model 2, also the forward selection model, but excluded the variables, alcohol and education; 4) Model 3, the backwards elimination model (removes non-significant effect modifiers); and 5) Model 4, the stepwise selection model (finds the best predictor variables from all other possible predictors). There were 10 logistic regression analyses performed. The logistic regression analyses were performed first for all women in the two clinics, and second, for black women in the clinics. The unadjusted and adjusted analyses were computed using the variable resource mothers as the main predictor variable.

4.3.1 Logistic Regression Analysis for All Mothers and Black Mothers

In the unadjusted odds ratio for all mothers, there were 513 clients included for Southside and Grady. The dependent variable, \( y \), represented the low-birth weight outcome of infants born to mothers at Southside and Grady. If the infant was low or very low-birth weight the dependent variable, \( y \), was equal to one and equal to zero otherwise.
For the dependent variable, exposure to the Resource Mothers Program, x equals one if the mother is exposed to the Resource Mothers Program (Southside) and zero if there is no exposure (Grady). Because of the many missing responses for the variable, education, the variable was included in Model 1, but excluded from the other 3 logistic regression analyses in Table D.13 (see Appendices) for all mothers. Also, because there were so few clients who used alcohol, this variable was not included in either the unadjusted odds ratio or the 4 logistic regression models.

The unadjusted odds ratio for exposure to resource mothers was not significant (OR = .72; 95% CI = 0.44, 1.17), (see Appendices, Table D.13). In the adjusted models, the odds of mothers having a low-birth weight baby was significantly decreased if exposed to the Resource Mothers Program (Southside), (OR = 0.34; 95% CI = 0.16, 0.73). In Model 2, (excluding education and alcohol), Model 3 (the backwards elimination model), and Model 4 (controlling only for race, age, and family size), the odds of a mother having a low-birth weight infant, if exposed to the Resource Mother Program, was approximately one half times as clients at Grady who were not exposed (see Appendices, Table D.13).

For black mothers, the unadjusted odds ratio (OR = 0.49; 95% CI = 0.29, 0.83) was much lower than the unadjusted odds ratio for all mothers. Model 1 (the forward selection model, excluding alcohol) showed that Black clients at Southside who were exposed to the Resource Mothers Program were about one-third as likely as those at Grady to have a low-birth weight baby (OR = 0.30; 95% CI = 0.14, 0.63). In Model 2 (which excluded education and alcohol), Model 3 (backwards elimination) and Model 4 (controlling for race, age, and family size), mothers at Southside were approximately
one-half as likely as those mothers at Grady to have a low-birth weight baby
(Model 2 – OR = 0.50; 95% CI = 0.28, 0.88; Model 3 – OR = 0.48, 95% CI = 0.28, 0.84,
Model 4 - OR = 0.51, 95% CI = 0.30, 0.88), (see Appendices, Table D.14).

The significant variables for Model 1 were age 35 years or more, high school
graduate or less, and family size of 1 to 3 persons. In Model 2, family size of 1 to 3
persons, and street drug use were the only significant risk factors for low-birth weight. In
Model 3 only street drug use was a significant risk factor for low-birth weight (see
Appendices, Table D.14). The variable age 35 or more was significant in Model 4.

4.4 Association of Age with Risk of Low-birth Weight

The first three hypotheses for this study pertained to the association of age and the
risk of having a low-birth weight infant. These three hypotheses were discussed
simultaneously because they were very much related to each other in the study. The age
groups fell under one general category. The null hypotheses were as follows:

1. There was no difference in the birth weight of infants born to mothers at
   Southside Medical Center WIC Clinic who were below the age of 20 years
   and those born to mothers at the Grady Memorial Hospital WIC Clinic
   who were below the age of 20 years.

2. There was no difference in the birth weight of infants born to mothers at
   Southside’s WIC Clinic who were between the ages of 20 to 34 years and
   those born to mothers at Grady Memorial’s WIC Clinic who were between
   the ages of 20 to 34 years.
3. There was no difference in the birth weight of infants born to mothers at Southside’s WIC Clinic who were 35 years or more and those born to mothers at Grady Memorial’s WIC Clinic who were 35 years or more.

In this study, the mothers were categorized in three age groups. Those age groups were mothers less than 20 years; 20 through 34, and 35 and more. In Table D.5, the largest percentages of mothers were found to be between the ages of 20-34 years (Southside – 77.6%, Grady - 73.0%, and all other clinics statewide – 74.0%). The lowest percentages of mothers were in the age group of 35 and over (Southside - 6.7%, Grady - 6.6%, and all other clinics statewide - 6.3%). There was no significant difference in the distribution of these age groups between Southside and Grady, $X^2 (2, n = 513) = 1.61, p = .45$; or between Southside and all other clinics statewide, $X^2 (2, n = 49,767) = 4.1, p = .13$.

Table D.6 (see Appendices), shows the characteristics of black mothers at Southside, Grady, and all others clinics statewide. Most black mothers were between the ages of 20-34 years (Southside - 77.4%, Grady - 67.7%, and all other clinics statewide - 72.5%); and the lowest percentages of black mothers were in the age group of 35 years and older (Southside – 6.7%, Grady – 10.4%, all other clinics statewide – 7.1%). There were no significant differences in the ages of women at Southside and Grady, $X^2 (2, n = 457) = 3.89, p = .14$; or at Southside and all other clinics statewide, $X^2 (2, n = 21,573) = 4.67, p = .10$.

The clients in the study ranged in ages from 13 to 45 years at Southside (M = 24.6, SD = 5.58), 14 to 40 years at Grady (M = 24.28, SD = 5.69), and from 13 to 53 years at all other clinics statewide (M = 24.33, SD 5.60), (Table D.7). In Table D.8,
(see Appendices) black clients ranged in ages from 13 to 45 years at Southside (M = 24.51, SD = 5.59), 14 to 40 years at Grady (M = 24.48, SD = 6.22), and 13 to 50 years at all other clinics statewide (M = 23.85, SD = 5.37), (see Appendices, Table D.8).

Mothers at Southside showed little difference in the mean infant birth weights for the different age groups: below age 20 years (M = 6.31, SD = 1.33); age 20 to 34 years (M = 6.64, SD = 1.18); and age 35 years or more (M = 6.56, SD = 1.28), (Table D.11). At Grady, mothers who were age 35 years or more (M = 5.45, SD = 1.87) showed a lower mean infant birth weight than mothers less than 20 years (M = 6.44, SD = 1.31), or mothers age 20 to 34 years (M = 6.56, SD = 1.50). These differences, however, were not significant, (see Appendices, Table D-11). Nor were they significant for black mothers (see Appendices, Table D.12).

In Table D.9 (see appendices) a chi-square analysis of the distribution of each variable was performed to compare the percent of low-birth weight infants between Southside and Grady, and Southside and all other clinics statewide. The table gives the percentages of infants with low (or very low) birth weight among mothers who attended Southside (exposed to resource mothers), Grady (unexposed to resource mothers) and all other clinics statewide, stratified by selected risk factors. The table shows that for the variable, age, the largest percentages of low-birth weight babies were born to mothers age 35 years or more at Southside (25%), Grady (40%), all other clinics statewide (18.1%). Mothers under age 20 were also slightly more likely to give birth to low or very low-birth weight infants (Southside -21.1%, Grady - 19.4%, and all other clinics statewide 17.7%), than mothers age 20 – 34. However, there was no significant difference found either between Southside and Grady X² (1, n= 513, = 0.13, p = .94), but
there was a significant difference between Southside and all other clinics statewide for
the three age groups, $X^2 (2, n = 49,767 = 92.9, p = <.0001)$.

The chi-square analyses performed for black mothers showed that the largest
percentage of low-birth weight babies were born to women age 35 years or more at
Southside (25.0%) and Grady (40.0%). While the largest percentage of low-birth weight
babies in all other clinics statewide were born to mothers under age 20 (22.3%). There
were no significant differences found among these groups of clinics (see Appendices,
Table D-10).

In the logistic regression analyses (see Appendices, Table D-13) for all mothers,
age 35 years or more was a risk factor for low-birth weight for the unadjusted odds ratio
(OR = 2.35; 95% CI = 1.07, 5.16). Age 35 years or more was also significant in Model 1
(OR = 3.43; 95% CI = 1.33, 8.84), and in Model 4 (OR = 2.14; 95% CI = 0.96, 4.78).

In Table D-14 for black mothers, age 35 or more was also a risk factor for
low-birth weight in the unadjusted odds ratio (OR = 2.27; 95% CI = 1.03, 5.03); Model 1
(OR = 3.46; 95% CI = 1.32, 9.10); and Model 4 (OR = 2.20; 95% CI: 0.98, 4.93). Thus,
the predictor variable age was significantly associated with low-birth weight in all
models.

4.5 Association of Cigarette Use with Risk of Low-birth Weight

The fourth hypothesis for this study was the association of cigarette use and the
risk of low-birth weight. The fourth hypothesis was as follows:
4. There was no difference in the birth weight of infants born to mothers who were baseline users of cigarettes versus those infants born to mothers who were non-users at the Southside and Grady Memorial WIC Clinics.

Most clients in the study reported that they did not smoke cigarettes (Southside - 97.8%, Grady - 97.9% and all other clinics statewide - 89.4%). There was a significant difference in the distribution of cigarette use between Southside and all other clients statewide, $X^2(1, n = 49,113) = 26.8, p = <.0001$, but no significant differences between Southside and Grady, (see Appendices, Table D.5). The percentages of black mothers who did not smoke cigarettes at Southside (97.8%); Grady (96.8%), and all other clinics statewide (96.3%) were very similar to the percentages for all mothers, (see Appendices, Table D.6). There was no significant difference in the distribution of cigarette use between black mothers at Southside and Grady, $X^2(1, n = 451) = 0.30, p = .58$), or between Southside and all other clinics statewide, $X^2(1, n = 21,244) = 2.07, p = .15$.

The use of cigarettes per day ranged from 0 to 20 at Southside (M = 0.17, SD = 1.60), 0 to 8 at Grady (M = 0.10; SD = 0.80), and 0 to 20 at all other clinics statewide (M = 1.13, SD = 3.99), (Table D.7). For black mothers, the use of cigarettes per day ranged from 0 to 20 for Southside (M = 0.17, SD = 1.60), 0 to 8 for Grady (M = 0.16, SD = 0.99), and 0 to 20 for all other clinics statewide (M = 2.38 to 5.68), (see Appendices, Table D.8).

The mean infant birth weight among mothers who smoked at Southside (M = 6.46, SD = 1.36) was not significantly different from the mean infant weight of mothers who did not smoke at Southside (M = 6.60, SD = 1.21, t(360) = .30, p = .80,
two-tailed), (see Appendices, Table D.11). Also, there was no significant difference between the mean infant birth weight of mothers who smoked (M = 5.76, SD = 0.55), and mothers who did not smoke at Grady (M = 6.48, SD = 1.53), (see Appendices, Table D.11).

For black mothers (see Appendices, Table D.12), the mean infant birth weight for those mothers who smoked cigarettes (M = 6.46, SD = 1.36), and those mothers who did not smoke (M = 6.58, SD = 1.21 at Southside were not that different. There was no significant difference in the mean infant birth weight of mothers who smoked or did not smoke at Southside, t(357) = 0.29, p = .77 or Grady, t(92) = 0.59, p = .56.

For all mothers, (see Appendices, Table D.9) there was no significant difference in the percent of infants born with low (or very low) birth weight who were users or non-users of cigarettes between Southside and Grady, $X^2(1, n = 505) = 0.18$, $p = .67$, but there was between Southside and all other clinics statewide, $X^2(1, n = 49,113) = 96.2$, $p < .0001$. In Table D.10 for black mothers, there was no significant difference in the percentages of infants born with low (or very low) birth weight among mothers who did smoke or did not smoke at Southside and Grady, $X^2(1, n = 451) = 0.07$, $p = .79$, or at Southside and all other clinics statewide, $X^2(1, n = 21,151) = 0.03$, $p = .87$.

In the logistic regression analyses (see Appendices, Table D.13), as noted before, cigarette use was not one of the significant risk factors for low-birth weight. In Table D-14 (see Appendices) for black mothers, cigarette use was again not significant. Only a small percent of black women smoked in the two clinics, 2.2% at Southside and 3.2% at Grady. Cigarette use was not a risk factors for low-birth weight in this study.
4.6 The Association of Street Drug Use with Risk of Low-birth Weight

The fifth hypothesis for this project was associated with street drug use and the risk of having a low-birth weight infant. The fifth hypothesis was as follows:

5. There was no difference in the birth weight of infants born to mothers who were baseline users of street drugs versus those born to mothers who were non-users at the Southside and Grady Memorial WIC Clinics.

As with cigarette use, most clients at Southside (95.6%), Grady (96.1%), and all other clinics statewide (96.0%) reported that they were non-users of street drugs. There was no significant difference between mothers who did or did not use street drugs at Southside and Grady, $X^2 (1, n = 513) = 0.06, p = .80$. Also, there was no significant difference between mothers at Southside and all other clinics statewide who did or did not use street drugs, $X^2 (1, n = 49,767) = 0.20, p = .66$, (see Appendices, Table 4.5). The percentages for black mothers who were non-users of street drugs were similar to those for all mothers, Southside (95.8%), Grady (97.9%), and all other mothers statewide (95.7%). The chi-square test was also insignificant for black mothers who were users and non-users of street drugs at Southside and Grady, $X^2 (1, n = 454) = 0.93, p = .33$; but not between Southside and all other clinics statewide, $X^2 (1, n = 21,570) = .01, p = .94$, (see Appendices, Table D.6).

The ranges for those mothers who were users of street drugs was from 0 to 2 times per week at Southside ($M = 1.04, SD = 0.21$), 0 to 2 times a week for Grady ($M = 0.04, SD = .20$), and 0 to 6 times a week for all other clinics statewide ($M = 0.04, SD = 0.20$), (see Appendices, Table D.7). For black mothers in the study, the ranges were from 0 to 2 times per week for Southside ($M = 1.04, SD = .20$), from 0 to 3 times a
week for Grady (M = .20, SD = .14), and 0 to 6 times a week for all other clinics statewide (M = 0.03, SD = .18), (see Appendices, Table D.8).

Also, for mothers who did or did not use drugs, the percentages of infants born with low (or very low) birth weight at Southside was not significantly different from Grady $X^2 (1, n = 513) = 1.51, p = .22$. Also, for mothers at Southside and all other clinics statewide, the percentages of infants born with low (or very low) birth weight were not significantly different for mothers who used or did not use drugs, $X^2 (1, n = 49,767) = 0.42, p = .52$, (see Appendices, Table D.9). There was no significant difference in the percentages of black infants born with low (or very low) birth weight between Southside and Grady whose mothers used or did not use drugs, $X^2 (1, n = 454) = 0.67, p = .41$, nor Southside and all other clinics statewide, $X^2 (1, n = 21,474) = 3.58, p = .06$, (see Appendices, Table D.10).

There was no significant difference in the mean infant weights between mothers who were and were not drug users at Southside, $t(360) = 1.05, p = .29$, or between mothers who were or were not drug users at Grady, $t(151) = .42, p = .68$, (Table D.11). There were also no significant differences in the mean infant birth weight among infants born to black mothers who used street drugs at Southside, $t(357) = 1.39, p = .17$ and black mothers at Grady, $t(95) = 1.18, p = .24$ (see Appendices, Table D.12).

In the logistic regression analysis for all clients, the risk factor street drug use was significant in the unadjusted odds ratio (OR = 2.40; 95% CI = 0.95, 6.07). According to the odds ratio for Model 1 (all variables included but alcohol), street drug use was not a significant risk factor for low-birth weight (OR = 2.45; 95% CI = 0.66, 9.96). In Model 2 (OR = 3.65; 95% CI = 1.34, 9.96) and Model 3 (OR = 3.13; 95% CI = 1.19, 8.21),
street drug use was a significant risk factor for low-birth weight (see Appendices, Table 4.13).

For black mothers, the unadjusted odds ratio (OR = 3.43; 95% CI = 1.27, 9.31) was significant for street drug use. Street drug use was not significant in Model 1 (OR = 3.02; 95% CI = 0.79, 11.54). However, the variable street drug use was significant in Model 2 (OR = 4.50; 95% CI = 1.59, 12.78) and Model 3 (OR = 3.83; 95% CI= 1.40, 10.52), (see Appendices, Table D.14).

4.7 High Nutritional Risk was Associated with Higher Risk of Low-Birth Weight

Hypothesis, number 6, states that high nutritional risk was independently associated with higher risk of low-birth weight. The hypothesis was as follows:

6. There was no difference in the birth weight of infants born to mothers at high nutritional risk at baseline versus those born to mothers at lower risk at the Southside and Grady Memorial WIC Clinics.

Most mothers at Southside, Grady, and all other clinics statewide were enrolled in this study because of their high nutritional risk status (Southside – 74.8%, Grady – 74.0%, all other clinics statewide - 59.4%), (see Appendices, Table D.5). For nutritional risk, there was no significant difference between the percent of mothers at high or normal nutritional risk at Southside and Grady, $X^2 (1, n = 511) = 0.04, p = .85$). However, there was a highly significant difference between the percent of mothers at high and normal nutritional risk at Southside and all other clinics statewide, $X^2 (1, n = 48,201) = 35.25, p = .0001$, (see Appendices, Table D.5).

For black mothers, there was no significant difference found between the percent of mothers at high or normal nutritional risk at Southside and Grady, $X^2$
(1, n = 453) = 0.60, p = .44. However, there was a significant difference found between the percent of mothers at high or normal nutritional risk between mothers at Southside and all others clinics statewide $X^2 (1, n = 20,782) = 14.51, p = .0001$, (see Appendices, Table D.6).

The percentage of infants with low (or very low) birth weight between mothers with high or normal nutritional risk at Southside was not significantly different from the mothers at Grady’s WIC Clinic, $X^2 (1, n = 511), = 0.920, p = .34$. Similarly, there was no significant difference between Southside and all other clinics statewide, $X^2 (1, n = 48,201), = 1.8253, p = .18$, (see Appendices, Table D.9).

For black mothers, the percentage of infants with low (or very low) birth weight between mothers with high or normal nutritional risk at Southside and Grady, $X^2 (1, n = 453) = 0.31, p = .58$, were not significant. Also, there was no significant difference found in nutritional risk between those black mothers at Southside and black mothers at all other clinics statewide, $X^2 (1, n = 21,474) = 2.89, p = .09$, (see Appendices, Table D.10).

Nutritional risk was not significant in any of the logistic regression models. In the backward elimination models and in the stepwise models, for all mothers and black mothers, nutritional risk was dropped or not included in the regression analysis.

4.8 Differences in Southside and Grady on Independent Variables

There were other differences between the clinic populations for some independent variables that were used in the study. These variables included racial/ethnic composition,
educational level, family size, family income, and marital status. These differences are described below.

Of the babies born to women at the two WIC Clinics, Southside Medical Center’s WIC Clinic had a lower percentage of low-birth weight babies (15.5%), than Grady (20.4%). There was no significant different between the percentage of low-birth weight babies at Southside and Grady, $X^2 (1, n = 513) = 1.48, p = .22$ (see Appendices, Table D.5). Similarly, there was no significant difference in the percent of low-birth weight babies born between mothers at Southside and all other clinics statewide (15.2%), $X^2 (1, n = 49,919) = 0.01, p = .92$, (see Appendices, Table D.5).

If only Black women were included (see Appendices, Table D.6) women at Southside (15.4%) were significantly less likely than women at Grady (27.1%) to have a low-birth weight baby, $X^2 (1, n = 454) = 7.09, p = .008$ However, the difference between Southside and all others clinics statewide (19.2%) was not significant, $X^2 (1, n = 21,474) = 3.27, p = .07$, (see Appendices, Table D.6).

4.8.1 Differences in the Racial-Ethnic Composition of the Clients

At the Southside Medical Center WIC Clinic, 99.2% of the clients were non-Hispanic blacks, three clients (0.8%) were Hispanics. At Grady, 63.2% of the clients were black, non-Hispanic clients (63.2%), 36.2% were Hispanics. Grady also had one client from the “all other” category (0.6%). The chi-square results between race-ethnicity at Southside and Grady were significant, $X^2 (2, n = 513) = 136.29, p = <.0001$, (see Appendices, Table D.5).

The composition of clientele at all other clinics statewide was very different from that of Southside or Grady. There were more clients in the “all other” category (44.2%),
at all other clinics statewide; while 42.7% were black and 13.1% were Hispanic. There were significant differences in the racial-ethnic distribution between Southside and Grady clinics $\chi^2 (2, n = 513) = 136.3, p = <.0001$; and between Southside and all clinics statewide, $\chi^2 (2, n = 49,767) = 465.35, p = <.0001$, (see Appendices, Table D.5).

The distribution of low (or very low) birth weight infants by racial ethnic group at Southside’s WIC clinic was significantly different from that of Grady, $\chi^2 (1, n = 513) = 6.39, p = .01$. Similarly, there was a significant difference between Southside and all other clinics statewide, $\chi^2 (2, n = 49,767) = 516.22, p = <.0001$, (see Appendices, Table D.9).

For the unadjusted mean infant birth weight among mothers at Southside, there was no significant difference among racial ethnic groups, $t(360) = -1.18, p = .27$. However, the unadjusted mean infant birth weight among racial ethnic groups for mothers at Grady was significant, $t(151) = -.2.29, p = .02$, (see Appendices, Table D.11).

In the logistic regression analyses, black, non-Hispanic race was significant in Model 3 (OR = 2.71, 95% CI = 1.03, 7.13); and Model 4 (OR = 2.72, 95% CI = 1.04, 7.13), (Table D.13). Being black, non-Hispanic was a risk factor for low-birth weight (see Appendices, Table D.13).

4.8.2 Differences in the Educational Levels of the WIC Mothers

The majority of mothers in the study were high school graduates or less, (Southside - 72.9%, Grady - 65.4%, and all other clinics statewide – 68.9%), (see Appendices, Table D.5). There was no significant difference in the educational levels between mothers at Southside and Grady, $\chi^2 (1, n = 306) = 1.61, p = .21$; nor for mothers
at Southside and all other clinics statewide, $X^2 (1, n = 29,310) = 1.69$, $p = .19$, (see Appendices, Table D.5).

Most black mothers in the study had a high school education or less (Southside - 73.2%, Grady - 59.4%, all other clinics statewide - 65.7%). There was a significant difference in the educational levels between the percent of clients at Southside and Grady, $X^2 (1, n = 288) = 4.55$, $p = .03$; and a significantly higher difference between Southside and all other clinics statewide, $X^2 (1, n = 15022) = 5.58$, $p = .02$ (see Appendices, Table D.6).

The educational levels of the WIC clients ranged from 7 to 18 years at Southside ($M = 11.60$, $SD = 1.60$), 6 – 16 years at Grady ($M = 10.38$, $SD = 3.19$), and 6 to 20 years at all other clinics statewide ($M = 11.06$, $SD = 2.51$), (see Appendices, Table D.7). The educational levels of black mothers in the study were similar, the levels ranged from 7 to 18 years at Southside ($M = 11.85$, $SD = 4.89$); 7 – 16 at Grady ($M = 12.52$, $SD = 9.16$); and 7 – 18 at all other clinics statewide ($M = 12.21$, $SD = 9.41$), (see Appendices, Table D.8).

There was no significant difference in the percentage of low (or very low) birth weights infants by educational level between Southside and Grady, $X^2 (2, n = 306) = 0.24$, $p = .63$, (Table D.9), or between Southside and all other clinics statewide, $X^2 (2, n = 29,310) = 0.53$, $p = .47$. In the logistic regression models for all mothers (see Appendices, Tables D.13), being a high school graduate or less was a risk factor for low-birth weight in Model 1, (OR = 2.34; 95% CI = 0.99, 5.49). In Model 1 for
black mothers, being a high school graduate or less was also a risk factor for low-birth weight (OR = 2.83; 95% CI = 1.14, 7.00), (see Appendices, Table D.14).

4.8.3 Differences in Family Size of the WIC Clients

Most mothers in the study lived in households with 4 or more persons, Southside (62.9%), Grady (62.5%), and all other clinics statewide (50.2%). There were significant differences in the family size between clients at Southside and all other clinics statewide, $X^2(1, n = 49,596) = 23.12, p = <.0001$, (see Appendices, Table D.5). For black mothers, the household composition was more likely to consist of 4 or more persons, both at Southside (62.6%) and Grady (62.5%). However, there were more black mothers living in households of 1 to 3 persons at all other clinics statewide (55.4%). There was a significant difference for family size between the percent of black mothers at Southside and the percent of black mothers in all other clinics statewide, $X^2(1, n = 21,507) = 45.96, p = <.0001$, (see Appendices, Table D.6).

The household compositions ranged from 1 to 10 persons at Southside (M = 4.14, SD = 1.40); 2 to 13 persons at Grady (M = 4.22, SD = 1.67); and 1 to 20 persons at all other clinics Statewide (M = 3.68, SD = 1.42), (see Appendices, Table D.7). For black mothers the household composition ranged from 1 to 10 persons at Southside (M = 4.13, SD = 1.41); 2 to 13 persons at Grady (M = 4.26, SD = 1.81); and 1 to 20 persons at all other clinics Statewide (M = 3.66, SD = 1.28), (see Appendices, Table D.8).

There was no significant difference found for the variable, family size, between mothers at Southside and Grady, $X^2(1, n = 513) = 3.412, p = .05$. However, there was a significant difference found for the variable, family size, between the percent of infants
with low (or very low) birth weight at Southside and all other clinics statewide, $X^2 (1, n = 49,596) = 49.3, P = <.0001$, (see Appendices, Table D.9).

For black mothers, there was no significant difference found in the percent of infants with low (or very low) birth weight for the variable family size between Southside and Grady, $X^2 (1, n = 454) = 1.99, p = 0.156$. However, there was a significant difference found between Southside and all other clinics statewide, $X^2 (1, n = 21,411) = 7.63, p = .006$, (see Appendices, Table D.10).

In the logistic regression models, a family size of 1 to 3 persons was significant in Model 1, which excluded alcohol, (OR = 2.01; 95% CI = 1.03, 3.90), (see Appendices, Table D.13. For black mothers (see Appendices, Table 4.14), the variable family size of 1 to 3 persons was a significant risk factor in Model 1 (OR = 2.14; 95% CI = 1.06, 4.31) and Model 2 (OR = 1.64; 95% CI = 0.98, 2.75).

4.8.4 Differences in Income Levels of the WIC Clients

Most mothers in the study had family incomes below $1,500 per month (Southside- 91.7%, Grady - 89.5%, and all other clinics statewide - 75.6%). There was a significant difference in family income between Southside and all other clinics statewide, $X^2 (1, n = 49,767) = 50.47, p = .0001$, (see Appendices, Table D.5).

Black mothers at Southside (91.6%) and Grady (90.6%) had similar proportions of incomes below $1,500 per month. There was a significant difference in the proportion of black mothers with incomes below $1,500 between Southside and all other clinics statewide, $X^2 (1, n = 21,570) = 7.09, p = .01$, (see Appendices, Table 4.6).

The monthly household incomes of the WIC clients ranged from $0 to $2,418 at Southside (M = $543.73; SD = $532.62); $0 to $2,362 at Grady (M = $754.77,
The ranges in monthly household incomes for black mothers were $0 to $2,418 at Southside (M = $543.73, SD = $532.62); $0 to $2,362 at Grady (M = $754.77, SD = $571.10), and $0 to $3,057 for all other clinics statewide (M=$1,132.86, SD = 985.39) (see Appendices, Table D.7). Family income was not a significant risk factor among any of the logistic regression analyses.

4.8.5 Differences in Marital Status of WIC Clients

A large percent of the women in the study were unmarried (Southside - 91.4%, Grady - 72.9%, and all other clinics statewide - 63.0%). For the variable marital status, there were significant differences in the percent of mothers between Southside and Grady, $X^2 (1, n = 512) = 30.36, p = <.0001; and between Southside and all other clinics statewide, $X^2 (1, n = 49627) = 124.47, p = <.0001, (see Appendices, Table D.5).

Similarly, for black mothers, a large proportion were unmarried (Southside - 91.6%; Grady - 87.4%; all other clinics statewide - 82.1%). Again, there was a significant difference for the variable marital status, in the percent of black mothers between Southside and all other mothers statewide, $X^2 (1, n = 21,524) = 21.83, p = <.0001. But, there was no significant difference between Grady and Southside mothers, $X^2 (1, n = 453) = 1.61, p = .20. Marital status was not significant in the logistic regression analyses (see Appendices, Table D.6).

4.9 Summary

Overall, the analyses showed that in most categories the women at Southside (exposed to resource mothers) had lower rates of low (or very low) birth weight, than those at Grady (unexposed to resource mothers). After adjusting for age, marital status,
family income, nutritional risk, alcohol use, cigarette use, and street drug use, the logistic regression analysis, Model 1, found that mothers at Southside were one-third as likely as those at Grady to have a low-birth weight baby (OR = .34; 95% CI = 0.16, 0.73). When excluding the variable education and alcohol from the regression model, being exposed to the Resource Mothers Program was still significant (OR = 0.53, 95% CI = 0.30, 0.94), (see Appendices, Table 4.13). The variable being exposed to resource mothers was significant in all regression models.

Similarly, in Table D.14, the regression analyses for black mothers, the variable being exposed to resource mothers was significant in all regression models, the unadjusted odds ratio (OR = 0.49; 95% CI = 0.29, 0.83); Model 1 (OR = 0.30; 95% CI = 0.14, 0.63), Model 2 (OR = 0.50; 95% CI = 0.28, 0.88), Model 3 (OR = 0.48; 95% CI = 0.28, 0.84) and Model 4 (OR = 0.51; 95% CI = 0.30, 0.88). Exposure to the Resource Mothers Program at Southside was effective at lowering the rate of low (or very low) birth weight for WIC clients.
CHAPTER 5

5. Results

5.1 Qualitative Analysis for Resource Mothers, Resource Mothers’ Clients, and Non-Resource Mothers’ Clients

One of the overarching questions in this study was “How does the Resource Mothers Program reduce low-birth weight?” As presented in Chapter 1, there were five main mechanisms by which it is hypothesized that the Resource Mothers Program may reduce the likelihood of clients having low-birth weight babies: (1) increasing access to care; (2) reducing tobacco use; (3) reducing alcohol use; (4) improving nutritional status and (5) providing social support. This chapter builds on the findings in Chapter 4 by presenting how clients and the resource mothers themselves viewed the relative importance of these different mechanisms.

The first section of the chapter presents results that answer the following seven questions:

1. Does the Resource Mothers Program work?
2. Does the Resource Mothers Program increase access to care?
3. Does the Resource Mothers Program reduce tobacco use?
4. Does the Resource Mothers Program reduce alcohol use?
5. Does the Resource Mothers Program improve nutritional status?
6. Does the Resource Mothers’ Program provide social support?

7. Was the Resource Mothers Program effective for women at all ages?

A summary can be found at the end of this chapter. The summary describes the findings of the qualitative analysis for this study.

5.2 The Resource Mothers Program Works

During the interviews with the resource mothers, the resource mothers agreed that the Resource Mothers Program did work. The resources mothers thought that the program was beneficial to the WIC clients. In discussing what was meant by “beneficial” resource mothers thought that the program was an asset to the clients because it taught the WIC mothers to be better parents, how to take care of their babies, how to take care of themselves, how to develop healthy nutritional habits. Resource mothers’ clients pointed to examples of program success such as clients’ obtained their high school education, while some clients went on to technical school and college. Many of the clients improved their nutritional habits, and most of them were non-smokers, non-drinkers of alcohol, and non-drug users. In the words of the resource mothers:

The program is necessary, very beneficial and an asset to the clients. It really helps the young pregnant mothers to have better pregnancies and to be better parents. I would not change the program for anything.

- resource mother

Overall, I think that the program is very good and important. The program makes a difference in the clients’ lives. It helps the clients to be a better person and a better parent.

- resource mother
I think that what we do actually helps the clients and the babies. The program works well because most of the clients keep coming back to the clinic. We are really helping the clients and the babies.

- resource mother

The program is a good asset to the WIC program. We do our best to service the clients in any way that we can, and it helps to improve the health of the clients and the babies.

- resource mother

Not only did the resource mothers agree that the Resource Mothers Program worked, the resource mothers’ clients and the non-resource mothers’ clients felt that the program worked also. The resource mothers’ client, as well as the non-resource mothers’ clients felt that the program was an asset to the WIC clinic and that there was nothing about the program that needed to be changed. Some clients felt that the program had taught them everything that they knew about their pregnancy and how to be a good parent. According to the clients:

The program is very good; they teach us all we need to know about being healthy while we are pregnant and how to have a healthy baby. They also teach us how to care for our baby. The program does not need to be changed.

- resource mother’s client

The Resource Mothers Program is really good. The resource mothers are there when you need them and they teach you all about your health, nutrition, and parenting. They have taught me everything and encouraged me to be healthy for myself as well as my baby. I would not change the program, because it is too important.

- resource mother’s client

I am not in the Resource Mothers Program, but it is a good program for the young ladies and teenagers. It teaches them about their pregnancy, and how to stay healthy during pregnancy in order to have a healthy baby. The program is very beneficial to the mothers. I would not change the program for anything.

- non-resource mother’s client
The Resource Mothers Program worked and reduced low-birth weight by helping the clients to improve their health behaviors (such as nutrition, smoking, drinking and using drugs). The social support that was provided by the resource mothers was also important in helping clients to remain healthy and to help decrease low-birth weight among the WIC clients.

5.3 Increasing Access to Care Issues

The resource mothers, resource mothers’ clients and non-resource mothers’ clients all had different perspectives on the issues of access to care. The resource mothers often stated that they provided transportation for the clients to RAP sessions held at Southside Medical Center, to social service organizations, to the grocery store, and to other facilities. According to one resource mother:

We provide pregnant teens or teen mothers with transportation. We provide or help provide them with transportation needs.

Interestingly, the resource mothers never provided transportation for the clients to the clinic for their WIC appointments. Rather, the clients always reported other means of transportation. Most resource mothers’ clients reported never missing a WIC appointment, saying that transportation was not a problem for them. Many of the resource mothers’ clients did not see transportation as an issue in getting to the clinic, prenatal care appointments, or any other place. These clients had access to transportation whether it was via their own car, a family member or boyfriend, the Southside’s van service, or local bus service. In the words of one client:

I have never missed a WIC appointment, the van picks me up. Southside has a van service.

- resource mother’s client
Nonetheless, of the twenty clients who were interviewed, three resource mothers’ clients did state that they missed their WIC appointments because of the lack of transportation, illness, lack of money, or because they were out of town. One of the responsibilities of the resource mothers was to call clients to remind them of their WIC appointments; and to contact the clients when they failed to attend their WIC appointments. The resource mothers encouraged clients to attend their scheduled appointments; that was one of the reasons that so many clients never missed their WIC appointments. In the words of one client:

I never missed an appointment because the resource mothers call you and get you and get on you and make you come in. It is important to keep your appointments.

- resource mother’s client

During observations at the WIC clinic, the researcher witnessed the resource mothers going to clients’ homes providing them with transportation to the clinic for RAP sessions. The resource mothers not only provided transportation for the clients, but also provided transportation for their family members to the RAP sessions as well. Resource mothers provided transportation to the clients, but it appears that the transportation was more for ancillary services (e.g. such as obtaining food from social service agencies) than for WIC appointments. However, the resource mothers’ may have taken transportation services from the resource mothers for granted. They may have thought that the resource mothers were responsible for getting them to the clinic for their appointments. Even though clients did not admit to having problems getting to and from their WIC
appointments, they reported that the resource mothers transported them to other places. In the words of one client:

The resource mothers took me to find a place to stay, and to get some food.

- resource mother’s client

As with the resource mothers’ clients, the non-resource mothers’ clients reported hardly ever missing their WIC appointments. Of the twenty non-resource mothers’ clients who were interviewed, only two clients missed their appointments because they did not have transportation to the WIC clinic. For instance, one client stated that she missed her appointment because of car problems:

I missed my WIC appointment because my car broke down, and I could not find anyone to bring me here.

- non-resource mother’s client

The non-resource mothers’ clients stated that they also missed appointments because of traffic, the Southside van service did not show up, or because of the lack of transportation. Since the non-resource mothers did sometimes miss their WIC appointments because of the lack of transportation, this may also have been the case for the resource mothers’ clients.

5.4 Reducing Tobacco Use

Upon entering the WIC clinic and attending their first prenatal care appointments, clients were told by their physicians and resource mothers about the hazards of cigarette smoking. Also, discussions and presentations were made at the RAP sessions by resource mothers regarding cigarette smoking and pregnancy; and WIC classes were taught that discussed the hazards of cigarette smoking. Of the 20 resource mothers’ clients who were interviewed for this study, nine clients admitted to smoking cigarettes
while they were pregnant; all of whom stopped after they were told to do so. Most clients
did stop smoking after they were told by their physicians and resource mothers about the
hazards of smoking during pregnancy; and after attending WIC classes that discussed
pregnancy and smoking. In the words of two clients:

I wasn’t a heavy smoker; I just puffed a little bit, but I just changed all that
cause I know with the baby it’s gonna be a major change, so I gotta do what’s
right for the baby.

- resource mother’s client

I tried to stop smoking the cigarettes then, I stopped smoking the
cigarettes.

- resource mother’s client

Some resource mothers’ clients found it difficult to stop smoking. In the words of
one client:

What’s hard was trying to quit cigarettes, which I had stopped buying by the
pack; that was hard but I quit.

- resource mother’s client

Only three of the 20 non-resource mothers’ clients who were interviewed reported
that they smoked during pregnancy. The non-resource mothers’ clients were older and
more mature than the resource mothers’ clients; and felt very comfortable in discussing
their cigarette smoking with the researcher. As such, the researcher did not believe that
this represented any underreporting of cigarette use. Rather, most of these clients already
had one child and knew that they would have to stop smoking. Therefore, after most
non-resource mothers’ clients found out that they were pregnant, they immediately
stopped smoking cigarettes. Both the resource mothers’ clients and the non-resource
mothers’ clients did not report having any difficulty in discontinuing their tobacco use.
The non-resource mothers’ clients reported that it was easy to stop smoking while they were pregnant. According to two clients:

Smoking cigarettes was the change that I made. I had to quit smoking cigarettes which was easy to change.
- non-resource mother’s client

The change that I made while I was pregnant was not to smoke, which was easy to change.
- non-resource mother’s client

Of the 20 resource mothers’ clients who were interviewed, only one client reported alcohol use; and two non-resource mothers’ clients reported alcohol use. Of the 40 clients who were interviewed, only two clients reported marijuana use, and those clients were resource mother’s clients.

5.5 Alcohol and Drug Use Could be Low

Alcohol and drug use by the Southside and Grady WIC clinics could possibly be low. The literature does present reports of low rates of alcohol and drug use by African Americans, especially African-American females. These rates are discussed below.

5.5.1 African-American Females Report Low Rates

There was also a possibility that alcohol and marijuana use could be low, because African-American females reported low rates of alcohol and marijuana use. Relatively few African-American female teenagers (37.0%), in grades nine through twelve, Currently use alcohol (CDC, 2004). The use of alcohol by African Americans ages 18 to 25 was lower (48.4%) than any other group in 2002 (SAMHA, 2003).
African Americans, ages 12 to 17, reported the lowest use of marijuana (17.6%) than any other group in 2002 (SAMHSA, 2003). In 2003, African-American teenagers in grades 9 through 12 reported 18.1% marijuana use in the United States in 2003 (CDC, 2004).

During clients’ initial appointments to the WIC clinic and for prenatal care, they were advised of the dangers of alcohol and drug use while pregnant. The resource mothers held classes with clients to discuss alcohol and drug use, as well as discussing the topic at the RAP sessions. All clients who reported alcohol use also reported that they discontinued drinking, and it was easy for them to stop drinking. These clients discontinued their alcohol use because of fears they had about the harmful effects that these chemicals may have had on the unborn fetus. According to these clients:

All of my habits were easy to change. I really didn’t like drinking; I used to do it ‘cause I seen someone else do it so it was easy to stop drinking so that my baby would be born healthy.

- resource mother’s client

While I was pregnant, drinking alcohol was very easy to change. I had to stop drinking so that I would not harm my baby.

- non-resource mother’s client

Of the two clients who smoked marijuana, both did discontinue using the drug while they were pregnant. However, they did have a difficult time trying to stop smoking the drug. In the words of one client:

I used to smoke marijuana, but I stopped doing that, so that was not easy for me to change. But I had to, especially by being you know having a baby.

- resource mother’s client
Some women reported using marijuana to control nausea during pregnancy (Magee, Chandra, Mazzotta, Stewart, Koren, and Guyatt, 2002). Medical marijuana is often used to relieve symptoms of nausea (Prentiss, Power, Balmas, Tzuang, and Israelski, 2004). According to one client:

I made a lot of changes. I had tried to stop smoking. I was smoking marijuana, but I tried to stop smoking it but when I was… I mean I woke up in the morning and try to eat and when I eat I’ll throw up, and so when I throw up I just can’t…I can’t eat without smoking marijuana. I stopped though. I don’t do it no more.

- resource mother’s client

5.6 The Resource Mothers Program Improves Nutritional Status

The resource mothers’ clients and the non-resource mothers’ clients received similar messages from their physicians, resource mothers, and WIC staff regarding nutrition. Clients were lectured on the importance of eating nutritious and healthy foods, unhealthy foods to avoid, preparing nutritious and healthy food. They were told to drink enough water, milk and juices, as well as the need to eat enough food. These clients learned the different food groups, how to prepare foods correctly, and what proportions of the different foods were needed in order to maintain a healthy diet. Eating healthy meant to eat foods from the five healthy food groups such as; grain products, vegetables, fruits, protein foods, milk and milk products.

5.6.1 Eating Nutritious and Healthy Foods

Many clients did not know how to eat or prepare healthy food nor did they know what food was considered healthy. During prenatal care visits, 19 resource mothers’
clients and 17 non-resource mothers’ clients stated that their physicians told them to eat healthy during their pregnancies. According to two clients:

My doctor told me to eat all the healthy foods that I needed to eat.

- resource mother’s client

The doctor told me to eat healthy.

- non-resource mother’s client

The resource mothers or WIC staff talked with clients about maintaining a healthy diet, eating healthy, and the amounts of food needed to maintain a healthy diet. They also talked with the clients about the different food groups. In the words of the resource mothers:

We talk to the clients about nutrition and teach them how to eat the right foods.

- resource mother

We have programs set in place to teach clients about eating healthy.

- resource mother

In the words of two clients:

I learned in the clinic to eat right. I’m also suppose to eat three meals a day and when I have snacks to have a healthy snack. I’m suppose to have all of the food groups in one meal.

- resource mother’s client

The clinic told me to eat healthy and what portions of each food groups I should eat every day.

- non-resource mother’s client

The resource mothers’ clients and the non-resource mothers’ clients were advised by their physicians to eat nutritious foods such as fruits, vegetables, cheese, eggs, liver,
chicken, rice, cereals, and to take prenatal vitamins. Some of the vegetables that the
physicians mentioned were string beans and green peas. In the words of the clients:

   The physician told me to eat vegetables, eat a lot of fruits, a lot of cheese, and to
take my vitamins everyday.
   - resource mother’s client

   My physician told me to eat well, eat vegetables, fruits, and cheese. Also, eat the
right kinds of food that would be good for me.
   - non-resource mother’s client

5.6.2 Unhealthy Foods to Avoid

The WIC clients were advised by their physicians, resource mothers, and WIC
staff to cut back on eating sweets, fried foods, and going to fast food restaurants. The
study revealed that six resource mothers’ clients and two non-resource mothers’ clients
loved to eat foods such as hamburgers, cheeseburgers, and French fries from fast food
restaurants. Some clients ate at fast food restaurants on a daily basis. However, on
clients’ initial visits at the WIC clinic and for prenatal care, they were told not to eat from
these restaurants because the food was too fattening and contained many calories.

According to one client:

   I use to eat at a fast food restaurant everyday; it was my favorite place. Then my
doctor told me not to eat at fast food restaurants because he said the food had too
much fat. So I had to stop eating at the fast food restaurant and had to start eating
healthy.

   - resource mother’s clients

   These clients did take their physicians’ advice and stopped eating foods from fast
food restaurants. Of the eight clients (six resource mothers’ clients and two non-resource
mothers’ clients) that loved fast foods, it was easy for five of them to stop eating it and
difficult for three of them to stop. In the words of the clients:
It was not easy to stop eating from fast food restaurants; however, I had to stop eating it so that I would be healthy and my baby would be healthy.

- resource mother’s client

Well, I was craving fast food a lot and had to have it. But after talking to my doctor, I knew I had to stop eating it. So I stopped and it was easy to stop.

- non-resource mother’s client

5.6.3 Preparing Nutritious and Healthy Food

In order to help eliminate poor nutritional habits among WIC clients, the clinic provided knowledge regarding how to prepare and cook food adequately. The nutritionist, resource mothers, and WIC staff worked with the clients to demonstrate to them how to prepare and cook healthy meals. Clients were also given a lot of information on preparing and cooking healthy meals. According to one client:

What I learned in the clinic was how to prepare food so that it will be healthy.

- non-resource mother’s client

The resource mothers’ often checked with their clients to make sure that they were eating properly. They also lectured the clients when they did not prepare and cook food adequately. According to one resource mother:

We teach clients how to eat healthy, and how to prepare their food.

- resource mother

According to two clients:

Well, they got on me about not cooking my food right.

- resource mother’s client

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The resource mothers’ clients and the non-resource mothers’ clients learned the same thing about preparing and cooking their food. The only difference was that the resource mothers’ monitored how their clients prepared and cooked their food.

5.6.4 Drinking Enough Liquids

The physicians, resource mothers, and WIC staff told clients to drink plenty of water, milk and juices. Of the 40 clients who were interviewed, 11 resource mothers’ clients and eight non-resource mothers’ clients were told by their physicians to drink plenty of liquids. At the WIC clinic, six resource mothers’ clients and two non-resource mothers’ clients were told that drinking fluids would help keep them healthy during pregnancy. There were five WIC clients (two resource mothers’ clients and three non-resource mothers’ clients) who did not drink enough liquids before and at the beginning of their pregnancies. Clients did not drink much water, milk or juice because they did not really think about drinking these liquids, did not really care for these liquids or chose to drink sodas instead. According to one client:

I began to drink a lot of milk and water during my pregnancy, but I did not drink them that much before I was pregnant.

- resource mother’s client

After being told about the importance of drinking liquids, the clients did begin to consume more water, milk, and juice. Most clients found it easy to increase their liquid intake. According to the clients:

I began to drink a lot of milk and water, and it was easy to start drinking more.

- resource mother’s client

It was easy for me to start drinking a lot of water.

- resource mother’s client
5.6.5  Getting Enough to Eat

Six of the clients (five resource mothers’ clients and one non-resource mother’s client) had poor eating habits. The poor eating habits of these clients consisted of not eating regularly daily, not eating at all on some days, and not including vegetables in their diet. During the clients’ initial WIC and prenatal care visits, the WIC staff and physicians did explain the importance of eating regularly. These clients did not like to eat or did not eat on a regular basis. According to one client:

I don’t really like to eat, but since I’m pregnant I have to eat.

- resource mother’s client

These clients reported no problems in changing their eating habits. The clients knew that they had to change their eating habits in order to be healthy during their pregnancies and in order for them to deliver healthy babies. In the words of the clients:

Well, I didn’t eat vegetables, but when I was pregnant, I started making sure that I eat like three or four vegetables a day.

- resource mother’s client

While I was pregnant, I did not have an appetite and was never hungry. But I started eating so that my baby would be healthy.

- non-resource mothers client

Some clients did not have food because they were poor or homeless. Also, some clients would run out of food before the month was over. When clients did not have any food to eat, they relied on the resource mothers to provide food for them or to help them obtain food. In the words of two clients:

My resource mother bought food for me when I had nothing to eat.

- resource mother’s client
My resource mother took me to a social service organization to obtain food.

- resource mother’s client

5.7 Social Support

One of the most important aspects of the Resource Mothers Program was the social support provided to the WIC clients by the resource mothers. Social support has been variously defined as the existence, functional content, quantity, and/or quality of social relationships with family, friends, and even formal social institutions. Numerous studies had shown that when social support is high, the risk of mortality is reduced after controlling for various measures of health status and demographic characteristics (Rogers, Peoples-Sheps, Suchindran, 1996). Social support could have affected health and mortality through physiological and/or behavioral pathways (Berkman, 1995). Alternatively, some had proposed that social support buffers the association between stressors and health, and thus enhances health outcomes in the presence of stressors (Kaplan, Cassel, Gore, 1977).

5.7.1 Sources of Support

Unlike the resource mothers’ clients, who received social support from the resource mothers, the non-resource mothers’ clients received social support from family members, boyfriends, friends, pastors, physicians, and sometimes the resource mothers. The social support received by the non-resource mothers’ clients was mostly in the form of emotional support, instrumental support and informational support. In the words of the clients:

When I was stressed out, I talked with my boyfriend, he helped me out a lot with my problems.

- non-resource mother’s client
My manager helped me out a lot while I was pregnant; she gave me a baby shower, helped me get things and helped me out with my two other kids, and gave me a little time for myself to relax.

- non-resource mother’s client

The four types of social support are informational, instrumental, emotional, and appraisal. These types of support were widely used by the Resource Mothers Program. Because social support was derived from one’s family and social relationships, it had been conceptualized and measured in various studies as ties to friends, spouse, family, church, and other social groups. Emotional support involved the provisions of empathy, love, trust, and caring. Informational support was the provision of advice, suggestions, and information that a person could use in addressing problems. Appraisal support involved the provision of information that was useful for self-evaluation purposes, that is, constructive feedback, affirmation, and social comparison (Heaney and Israel, 1997). Each of these types of social support is discussed below.

5.7.2 Informational Support

Informational support was an important component of the Resource Mothers Program. The clients received from the resource mothers’ advice, information, and suggestions that were beneficial. Clients could feel free to talk with the resource mothers for advice and to seek information. The resource mothers served as a sounding board for the clients, and gave them advice and information that helped the clients improve their health behaviors and health status during pregnancy. According to clients, informational support was very beneficial to the program. In the words of the clients:
They talked with me about drugs, alcohol, and smoking while you are pregnant. They talk to us and give us information to read about the consequences of these bad habits. They also teach us how to care for our babies.

- resource mother’s client

Right now I’m looking for a place that I can have on my own by the summertime. My resource mother is helping me out by giving me different numbers and everything else.

- resource mother’s client

The non-resource mothers’ clients received informational support in the form of seeking advice, obtaining information, and attending prenatal care classes, parenting classes, nutrition information and classes, and breastfeeding classes. This informational support was received from the WIC staff, relatives, boyfriends, friends, and ministers. According to the non-resource mothers’ clients:

My mother gives me advice when I have problems, and tells me things that I need to do about my pregnancy.

- non-resource mother’s client

In the clinic, I learned how to eat the right foods and how to prepare your foods.

- non-resource mother’s client

5.7.3 Instrumental Support

The second major component of the program was instrumental support. Clients at the Southside Medical Center WIC Clinic depended on the resource mothers for tangible aid and services. These clients received help with food, clothing, shelter, transportation, items for their babies. The resource mothers were called upon to provide social services, or referrals to social service organizations. The resource mothers performed numerous functions in order to help and assist the young mothers who became members of the program. Resource mothers’ clients provided numerous examples of this support:
It’s wonderful. My resource mother helped me a lot while I was pregnant. She helped me with food, clothing for the baby, and help to get the items that I needed such as a baby bed, stroller, and other little things. Books about parenting, pacers, and a diaper bag. She helped me out a lot. Don’t know what I would have done without her.

- resource mother’s client

I was homeless for a minute and I came up here and that’s when I enrolled in the program. They helped me get shelter, gave me tokens for the bus, and I mean gave me food and some clothing.

- resource mother’s client

The resource mothers helped me get into technical school. They called and got material for me. They talked with the administration and wrote letters for me.

- resource mother’s client

The non-resource mothers’ clients received help with daycare, money, and housing from the WIC clinic. The most important form of instrumental support received by these clients was the WIC vouchers. The milk and food from the clinic helped the clients a great deal. In the words of the non-resource mothers’ clients:

The milk and food have been most helpful to me. They are so expensive I could not afford to buy them.

- non-resource mother’s client

The WIC program does all it can to help people with different things like food, daycare, money, and a place to live.

- non-resource mother’s client

The non-resource mothers’ clients did not get help with obtaining housing, clothing, or food for their kids. These clients had the same needs as the resource
mothers’ clients, and could have utilized the services of the resource mothers.

According to the non-resource mothers’ clients:

The Resource Mothers Program is good for the young mothers. I wish I had someone to help me obtain housing. I need another apartment. The apartment that I have is in a really bad area.

- non-resource mothers’ client

I am not in the Resource Mothers Program, but it is a good program and it helps the young mothers a lot. I wish I was in the program, I need help with getting extra food sometimes.

- non-resource mothers’ client

5.7.4   Emotional Support

The clients at Southside’s WIC clinic received various forms of empathy, love, trust and caring from the resource mothers. Some clients viewed the resource mothers as part of their family, or more like a mother. The resource mothers perceived themselves as an extended part of the clients’ families. According to the resource mothers’ clients:

I mean it’s just like they’re a role model, really. You can talk to them about anything that you might not wanna talk with other folks about. When I was pregnant, I use to come talk to my resource mother a whole lot about my problems, and she helped me.

- resource mother’s client

It’s helped me a lot because like the resource mother, she’s … when I was going through a period when I felt like giving up, I could come and talk to them. Like I was homeless for a minute. They are really nice up here, they are. They keep in touch – that’s what I like about them. I mean it’s really nice, really good.

- resource mother’s client

You can always call your resource mother. She like a real mother. You can just ask’em about anything ‘cause they have all that information. Young parents, they really need resource mothers ‘cause some of ‘em really don’t be having nobody to talk to.

- resource mother’s client

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Emotional support was also received by the non-resource mothers’ clients. The non-resource mothers’ clients received emotional support from their spouses, family members, and friends. In the words of the non-resource mothers’ clients:

My husband was a great help while I was pregnant, and he kept everything to himself.

- non-resource mother’s client

During stressful times, my manager was a great help. She helped me out by giving me a baby shower. She has helped me out by getting things for the baby and also with my other two kids. She has also given me things to help me relax. She is very good to talk to when I have problems.

- non-resource mother’s client

Of the 40 clients interviewed, no one mentioned that they did not like their resource mother or that they had any problems with the resource mothers. The resource mothers’ clients and the non-resource mothers’ clients thought well of and highly respected the resource mothers. Everyone thought that the resource mothers were doing an outstanding job.

5.7.5 Appraisal Support

Appraisal support was used by the resource mothers. There was no mention of appraisal support from the non-resource mothers’ clients. The resource mothers provided constructive feedback and affirmation to the clients regarding their health behaviors and interests. They let the clients know when they were on the right track and when they needed to make improvements in their daily lives. In the words of one client:

I like how they do the assessments every time you see them. They’ll say, well how you been doing in school, or how’s this going at your house, how’s that going, you know, and make sure you’re still on track and that you’re still having or focusing on your goals. That’s what I like.

- resource mother’s client
5.7.6 High and Low Risk Clients and Social Support

In the present study, high risk clients were those clients who had complications during their pregnancies. Low risk clients were those clients who had no complications during pregnancy. Of the clients interviewed, there were two high risk resource mothers’ clients and one high risk non-resource mother’s client. There were 18 low risk resource mothers’ clients and nineteen low risk non-resource mothers’ clients. The high risk clients were provided three types of social support (instrumental, informational, and emotional) by the clinic, while they were pregnant. In the words of the high risk clients:

The program helps you a lot. They teach you a lot. They help you get clothes, they help you get pampers, toys, and other things for your children. They give you little items when they have it to give.

- resource mother’s client

The Resource Mothers Program is really good. You can always call your resource mother. She is like a real mother. They help young mothers by giving them information. You can call and ask her for information on apartments, furniture and clothes for your children. You can just ask ‘em about anything ‘cause they have all that information. Young parents, they really need resource mothers ‘cause some of ’em really don’t have anyone to talk to.

- resource mother’s client

The clinic has helped me a whole lot. On the days I don’t have money and my baby needs some milk, I can just get the vouchers and go to the store and get what I need to it has benefited a lot.

- non-resource mother’s client
Low risk clients talked about the clinic providing them all four types of social support (emotional, appraisal, informational, and instrumental) while they were pregnant.

In the words of the clients:

The clinic helps me get food for my baby. They teach classes that I go to on the different things that help you become a better mother.

- resource mother’s client

When I was pregnant, I use to always call up her and ask them about what’s going on and stuff and they use to always tell me, you know, what’s going on with my body and help me.

- resource mother’s client

You can always talk with your resource mother when you have problems; they give you good advice, and teach you how to handle your problems.

- resource mother’s client

The clinic is very good; they have an incentive program that helps a lot. For completing all my classes and doing a good job, I got a car seat and some formula for my baby.

- non-resource mother’s client

5.8 Was the Resource Mothers Program Effective for Mothers at All Ages?

The Resource Mothers Program targeted teenagers and young mothers who were age 14 years or younger who were up to the age of 20 years. The teenagers and young mothers who were being seen by the resource mothers, thought that the program was effective. Clients who were older than 20 years were seen by the nutritionists and other WIC clinic staff, but not by the resource mothers. However, the non-resource mothers’ clients could have utilized the services of the resource mothers. These clients had similar problems as the resource mothers’ clients. According to the clients:

I just graduated from high school and found out I was pregnant. The resource mothers are doing a good job. They give out information, and help the mothers. I like coming to the classes and learning more about what I can do to help my baby
stay healthy and I can eat the right things and know what to do while I am pregnant.

- resource mother’s client

I found out I was pregnant when I was about to enroll in technical school. But the resource mothers helped me get into technical school. They got my material for me and talked with the administration and wrote letters for me. They have helped me throughout my pregnancy. The program has made me a better person for me and for my baby. I know how to better take care of my baby. I know how to eat right. I know much more than I did before.

- resource mother’s client

I think that the program is excellent for young mothers and teenagers. I think that it is a good thing to have. But I am not in the program, but I wish I was. I could use a resource mother.

- non-resource mother’s client

5.9 Summary

Ex-Text software was used to code the qualitative data, develop a codebook and to select themes that were common among the clients and resource mothers. These themes were described throughout the text to answer the seven qualitative research questions.

The Resource Mothers Program provided transportation for clients mostly to ancillary care facilities, but not to the Southside WIC clinic for their scheduled appointments. Resource mothers mostly provided transportation to social service organizations, RAP sessions in the clinic after hours, and to grocery stores. Clients utilized the Southside van service, public transportation, their own transportation, or received transportation from a family member or friend. These clients didn’t seem to have problems in getting to their WIC appointments.

Physicians and resource mothers discussed the consequences of tobacco use with clients on their initial visits for prenatal care and to the WIC clinic. Tobacco use and its’
hazards were discussed with clients in WIC classes and RAP sessions. Of those clients who admitted to smoking cigarettes, most of them stopped smoking after being advised about the harmful affects of smoking by their physician during prenatal care visits or after discussions with their resource mother.

As with the WIC data set from the state of Georgia, few clients admitted to alcohol use. Only one client in the Resource Mothers Program admitted to alcohol use; and two clients reported marijuana use. Clients discontinued their alcohol and drug use after being told of the many hazards these products could cause while pregnant by their physicians and through mechanisms used by the resource mothers. Very few clients admitted to alcohol and drug use, but those who did admit to it discontinued after they entered the WIC program. The resource mothers may have helped those who were using alcohol and marijuana.

Nutritional education was one of the foundations of the Resource Mothers Program. Resource mothers’ clients and non-resource mothers’ clients received similar messages from physicians, resource mothers, and WIC staff about good and healthy nutrition. The resource mothers taught the clients how to eat healthy foods, prepare and cook healthy foods, and showed them the exact proportions of food that was needed for each meal. Resource mothers helped needy clients obtain food. Physicians and resource mothers told clients to drink plenty of water, milk and juice, and not to drink many caffeine products. Many clients improved their nutritional status.

Social support, in the form of informational, instrumental, emotional and appraisal support, was one of the highlights of the Resource Mothers Program. Clients depended greatly on the resource mothers as a source to vent their problems. The
resource mothers served as an extended part of the clients families. Resource mothers educated their clients by teaching WIC classes, giving client’s pamphlets and brochures on various health related issues, making presentations at RAP sessions, discussing issues with the clients and serving as a confidant to clients.

The resource mothers also greatly benefited from the program. These women improved their personal and social skills, learned to deal with others, became professional speakers, and improved their social networks. The resource mothers tried to promote positive well-being among the clients, as well as, helping them to improve their self-esteem and motivation.
6. Summary, Conclusions, And Recommendations

6.1 Summary of Methodology

The overriding purpose of this study was to understand whether and how the Resource Mothers Program influences birth outcomes among low-income African-American women. However, the goals of the Southside Medical Center were (1) to increase the knowledge and awareness of women about the benefits of breastfeeding, prenatal care, and learning parenting skills; to increase the number of women who decide to breast-feed and seek prenatal care during their first trimester; to provide support by increasing access to the healthcare system and reducing socio-cultural barriers; to reduce the number of repeat pregnancies in the teen population; and to develop a strong male mentorship within the program in order to increase the father’s role within the family (Southside Healthcare, Inc., 1999). This research was conducted by investigating the differences between low-birth weight infants born among African-American women who were unexposed to the Resource Mothers Program and those born to women who were exposed to the Resource Mothers Program in the Women, Infants, and Children (WIC) Program in Atlanta, Georgia.

The study used both qualitative and quantitative research for this investigation. The quantitative data for the study was obtained from the state of Georgia’s WIC
program for fiscal years 1999 and 2000. Specifically, the objectives of the study guided the following research questions and hypotheses:

(1) Did the Resource Mothers Program work?
(2) Did the Resource Mothers Program increase access to care?
(3) Did the Resource Mothers Program reduce tobacco use?
(4) Did the Resource Mothers Program reduce alcohol use?
(5) Did the Resource Mothers Program improve nutritional status?
(6) How did the Resource Mothers Program provide social support?
(7) Was the resource Mothers Program effective for women of all ages?

6.1.1 Summary of the Population and Sample

The study was conducted with data from the Southside Medical Center WIC clinic and the Grady Memorial Hospital WIC clinic. Data for the quantitative analyses for this study were obtained from the state of Georgia’s WIC program, for fiscal years 1999 and 2000. The WIC dataset consisted of a total of 361 clients from Southside Medical Center; and a total of 152 clients from the Grady Memorial WIC clinic.

Data for the qualitative analyses were collected from two groups at the Southside Medical Center, the resource mothers (n = 4) and clients (n = 20). Semi-structured interviews were used to interview the resource mothers and clients at Southside.

The clients interviewed were between the ages of 18 and 26.

Both types of data suggested that the Resource Mothers Program was effective in lowering the rate of low (or very low) birth weight for WIC clients. The discussion below provides evidence to support the effectiveness of the Resource Mothers Program, using both qualitative and quantitative analyses.
6.2 Did the Resource Mothers Program Work?

This study was looking at two different clinic populations, women who received WIC Services at Southside Medical Center and Grady Memorial Hospital. The quantitative analyses compared Southside Medical Center WIC clients (who were seen by resource mothers) with the WIC clients at Grady Memorial Hospital (who were not seen by resource mothers). Whereas, the qualitative analyses compared clients at the Southside WIC clinic who were being seen by resource mothers and those clients at Southside who were not being seen by resource mothers.

For two reasons, the data for this study supported that the Resource Mothers Program worked. First, after controlling for possible confounders in the logistic regression analyses, the rate of low-birth weight for infants was found to be significant and lower at the Southside Medical Center’s WIC clinic, than at the Grady Memorial Hospital’s WIC clinic. The main difference between Grady and Southside was that one facility had a Resource Mothers Program and the other facility did not. Second, the resource mothers and clients at the Southside Medical Center agreed that the Resource Mothers Program did work. The resource mothers thought that the program was necessary and an asset to the clients. The resource mothers’ clients and the non-resource
mothers’ clients felt that the program was an asset to the WIC clients and that there was nothing about the program that needed to be changed.

6.2.1 Previous Research

According to Olds and Kitzman (1993), the first Resource Mothers Program was established in 1980 in South Carolina. Since that time, approximately 300 more Resource Mothers Programs have formed across the nation. In 1991, the National Commission to Prevent Infant Mortality, endorsed the Resource Mothers Program. The commission established by Congress in 1987 to create a national strategic plan to reduce infant mortality and morbidity in the United States. The Commission launched the Resource Mothers Development Project, a national outreach home visiting initiative for families at risk for poor birth outcomes. Even though this initiative was launched, there has been limited research in the literature on low-birth weight interventions with Resource Mothers Programs or lay health advisors interventions.

Other studies utilizing the services of lay health advisors (L.H.A.) or resource mother type interventions have appeared to work. These resource mothers are often called paraprofessionals because they have received specialized training in order to meet the needs of a patient population or to implement a research or project intervention (Logsdon, 2004). Resource mothers are lay community women who develop a mentoring relationship with patients and their families. For instance, the resource mothers were used in a program housed in Norfolk, Virginia where the program was evaluated to determine if a higher rate of prenatal care helped to improve the low-birth weight rate among teenagers. Compared with a traditional clinic-based multi-disciplinary program,
those patients in the Resource Mothers Program had a higher incidence of early prenatal care and a lower birth rate (Julnes, Konefal, Pindur, and Kim, 1994).

Like the present study, the Norfolk study encouraged early prenatal care, used para-professional home visitors who were similar in race and socioeconomic status as the pregnant teenagers. However, unlike the present study, the Norfolk study was a community-based lay home visiting initiative for pregnant adolescents aged 17 years or under. Maybe a clinical setting and a home visiting setting both produce effective results when pregnant mothers are in contact with resource mothers; or it may suggest that the clinic focus of the Resource Mothers Program is unnecessary.

Another program in South Carolina used resource mothers to provide social support and to encourage teenagers to seek adequate prenatal care. The project had a Resource Mothers Program, who used trained community residents to visit pregnant women and children. These resource mothers tried to improve birth outcomes by providing pregnant mothers with information about maternal, child health, and development. They also linked mothers with health care and other community services. The resource mothers served as mentors to the expectant mother throughout her pregnancy, delivery, and the first year or more of her child’s life. Teenagers in the program were more likely to seek prenatal care early and adequately than teens in other counties. These mothers were also less likely to have a preterm birth than other teens (Rogers, Peoples-Sheps, and Suchindran, 1996).

Paraprofessional women (resource mothers) were used to provide social support and to encourage teenagers to seek adequate prenatal care in the Southside and Grady study. Again, like most other studies, the resource mothers in the South Carolina study
were in a home visiting program, while the resource mothers at Southside were providing care both in the WIC clinic and in the home. At Southside, the WIC clinic provided on-site education to clients about parenting, caring for their infant, nutrition, and referrals to social service organization. The on-site class structure at Southside may be more appropriate for training and educating a larger group of clients, compared with the one-on-one training in South Carolina. It appears that staffing would be a problem in the home visiting programs.

Yet another study utilized resource mothers to reduce the risks of the fetus from developing mental retardation. The study found that the Resource Mothers Program reduced the delay in attaining metabolic control in pregnant women with phenylketonuria. The resource mothers’ activities with the pregnant women included cooking, shopping, meal planning, preparing for the baby, talking about pregnancy, and discussing medical recommendations. These activities were also conducted by the resource mothers at the Southside Medical Center. The differences in the two studies were that the study to reduce mental retardation had resource mothers who were extensively trained. Also, these resource mothers held weekly planned sessions with clients in their homes. Resource mothers in the Grady and Southside study were not extensively trained and did not have weekly planned sessions with their clients. Resource mothers housed in a clinical setting, seeing clients for scheduled WIC appointments and
teaching WIC classes may be as effective as those resource mothers in home visiting programs who have specialized training.

6.2.2 Differences Between Southside and Grady

Because the Southside and Grady study was not an experimental trial there must be some caution used in explaining the differences in the rate of low-birth weight among the two clinics. There may be other differences that could explain the lower rate of low birth weight at Southside and Grady. These other differences that could be considered were the differences in the clients at the two WIC clinics, the sizes of the facilities, the health care providers serving the clients, and services rendered at a neighborhood medical center versus a primary hospital.

While there are some differences between the two clinics (Southside and Grady); overall the two clinics are very similar. Even though Grady’s WIC clinic is located in a primary hospital, the hospital serves inner city and medically indigent clients in Fulton and Dekalb counties. Southside’s WIC clinic is located in a non-profit health organization that provides healthcare to impoverished neighborhoods, which includes primarily poor neighborhoods in Southside Atlanta specifically through Fulton, Dekalb, and Clayton counties, including the Thomasville Heights area adjacent to a federal prison. The clients at Southside consist mostly of community residents who live in the surrounding area. Clients at Grady’s WIC clinic are from all over Atlanta and the Atlanta metropolitan areas. However, most clients at both clinics were poor and have a high school education or less. Other than the presence of the resource mothers, the overarching difference between the two clinics is that the Southside clinic is located in a neighborhood medical center, while the Grady clinic is located in a hospital setting.
Also, the client population at Grady is much larger than that of Southside. The researcher could not find literature that proved neighborhood health clinics have better outcomes than hospitals.

6.3 Did the Resource Mothers Program Increase Access to Care?

The resource mothers provided clients with transportation to ancillary facilities, not to the WIC clinic for their appointments. Many of the resource mothers’ clients did not see transportation as an issue in getting to the clinic, their prenatal care appointments, or any other place. These clients had access to transportation from other sources. Even though clients did not admit having problems getting to and from their WIC appointments, they did report that the resource mothers transported them to other places.

The resource mothers helped clients access the system by calling clients to remind them of their WIC appointments; and contacting the clients when they failed to attend their WIC appointments. They also encouraged clients to attend their scheduled appointments; this was one of the reasons that the Southside clinic had such a high utilization rate.

6.3.1 Review of Previous Research

Several lay home visiting programs had increased access to care for clients by caring for patients in their homes. One such program was in Virginia, The Norfolk Resource Mothers Program, which supports disadvantaged teens through the use of home visitors who are similar to the teens in race and socioeconomic status. The program encourages early prenatal care. An evaluation of the program found that teenagers with a resource mother received more adequate prenatal care because the clients were being encouraged to seek care (Julnes, Konefal, Pindur, and Kim, 1994).
In a Community-Academic Health Center Partnership started by Kaiser Hawaii, community health workers were employed to increase Medicaid enrollees’ access to preventive services. The community health workers help patients to obtain information, understand how to utilize Kaiser Permanente facilities, and provide linkages to other services not provided by Kaiser Permanente, such as housing, food stamps, legal services and so forth. Community health workers were being used to facilitate health care access through outreach, contributing to continuity, coordinating and overall quality of care; while educating health care providers about community health needs, cultural relevance, and outcomes of care (Knobel, 1992). In both programs, the utilization rate for clients greatly improved. In the Resource Mothers Program in South Carolina, resource mothers seek to improve birth outcomes by linking mothers with health and other community services. These mothers serve as mentors to the expectant mothers throughout her pregnancy. Rogers study found that in a study in South Carolina, unmarried teens in the intervention group were more likely to initiate prenatal care early and receive more adequate prenatal care than those in the comparison group who were not in the Resource Mothers Program (Rogers, Peoples-Sheps, and Suchindran, 1996).

It appeared that the Southside and Grady study was the only resource mothers’ study that actually cared for clients both in the clinic and for home visits. Maybe the Resource Mothers Programs housed inside WIC clinics work as well as the home visiting programs. The resource mothers at Southside called clients to follow-up on appointments and to make other health care appointments for the clients. Southside’s resource mothers not only encouraged clients to keep their scheduled appointments with the WIC clinic and for prenatal care, but they also provided transportation for the clients for ancillary
care. The Southside resource mothers were available to the clients 24 hours a day. This made a great difference to the clients because they knew that they always had someone to depend on; and that someone was always there for them. No other program mentioned in the literature, discusses a 24 hours on call service for clients.

6.4 Did the Resource Mothers Program Reduce Tobacco Use?

The data from the WIC clinics revealed that out of 513 clients at Southside and Grady, only 11 clients smoked cigarettes. In the qualitative one on one interviews, 12 of the 40 clients who were interviewed admitted to smoking cigarettes while they were pregnant. This may suggest that cigarette smoking was underreported in the data. The clients may have told the researcher about their smoking habits because their interviews were confidential, they trusted the researcher, and did not feel threatened by the researcher. If this underreporting was correct, the WIC data may not have captured all clients who smoked. Self-reporting of smoking habits has been widely used to estimate the prevalence of cigarette smoking (Coultas, Howard, Peake, Skipper, and Samet, 1988). However, respondents’ sensitivity to social stigma associated with smoking was cited as a major reason why persons might underreport their smoking status (Kozlowski, 1986).

Clients may have been afraid to tell the resource mothers and clinic staff about their smoking habits because they were having a difficult time quitting and did not know what to do. Remember, these women were told that they needed to stop smoking and were lectured about the harmful effects of smoking; but there was no evidence that they were educated on how to stop smoking. All nine resource mothers’ clients reported that
they did stop smoking after talking with their physicians or resource mothers or after attending WIC classes that discussed pregnancy and smoking.

There was no significant difference in the percent of clients who smoked between Southside and Grady. In the logistic regression analyses, cigarette use was not found to be a risk factor for low-birth weight. However, interviews with the clients determined that about one-half of those interviewed did smoke cigarettes, but stopped after they were told to do so.

6.4.1 Review of Previous Research

Previous studies have found self-reporting of smoking habits to be a problem. For instance, in a study assessing smoking status in patients with asthma and chronic obstructive pulmonary disease (COPD), 19 subjects with asthma claimed to be nonsmokers and yet had breath carbon monoxide levels (> 10 ppm) that showed they did smoke. Twenty-four subjects with COPD claimed to be non-smokers; however their breath carbon monoxide levels (> 11 ppm) showed that they were smokers. Eleven of these patients (2 with asthma and 9 with COPD) had serum cotinine levels of >50 ng/mL. The latter would be strongly suspected to be actual current smokers who were denying their habits. Self-report classification misclassified them as nonsmokers. The incidence of misreporting of smoking status was relatively low (Sato, 2003).

Several interventions have been designed to help pregnant women stop smoking cigarettes and tobacco. A Smoking Cessation in Pregnancy (SCIP) project was designed for women attending public prenatal clinics and WIC programs. Interventions for the program included a literature review, discussion with smoking cessation experts, focus groups conducted with pregnant or postpartum smokers and ex-smokers, input from local
clinic staff, and extensive pre-testing. The enrollment smokers attending intervention clinics were more likely to report quitting smoking by the eighth month, than were enrollment smokers attending control clinics (Kendrick, Zahniser, Miller, Salas, Stine, Gargiullo, Floyd, Spierto, Sexton, Metzger, Stockbawer, Hannon and Dalmat, 1995).

Unlike the SCIP project, in the Southside and Grady study, resource mothers not only provided clients with materials and messages about the hazards of smoking while pregnant; but made presentations to clients regarding tobacco use during pregnancy, taught classes that discussed this issue, and made presentations regarding the topic at RAP sessions held by Southside. This study used the resource mothers to educate the clients, while providing social support to the clients as well.

6.5 Did the Resource Mothers Program Reduce Alcohol Use?

The WIC data from the state of Georgia and the qualitative analysis both showed that few clients in this study reported alcohol use. Of the 40 clients interviewed, only one resource mother’s client and two non-resource mothers’ clients reported alcohol use. The interviews were consistent with the WIC data across the state of Georgia. However, in reviewing the WIC interview guide used to capture the data, the guide may not be asking questions about drinking that would allow clients to appropriately report their alcohol use. Alcohol use was not a risk factor for low-birth weight in this study.

Because the responses for alcohol use were so low at Southside (0.6%) and Grady (0.0%) the variable was removed from the logistic regression analyses. For this study, it appears that alcohol use was not a risk factor for low birth-weight in this population.
6.5.1 Review of Previous Research

Previous studies have found underreporting of alcohol use to be a problem. At 12 WIC sites in California, a study was implemented to increase the report of prenatal alcohol use in a community setting. The WIC program served the majority of all low-income pregnant women and 91% of all infants born to low income families in Los Angeles County. It was found that a great number of WIC clients were not reporting alcohol use based on the current WIC standard of care. A self reported alcohol screening tool was designed for 12 WIC sites, and 12 sites were used as control sites. The results of the study showed that the rate of alcohol use at the intervention sites increased significantly, and the rate at the control sites remained the same (Whaley and O’Connor, 2003).

It has been reported in the Saint Louis Campaign: Don’t Drink During Pregnancy that most women do stop drinking once they become pregnant (Saint Louis University, 2004). The results of this campaign were consistent with the WIC data across the state of Georgia. Also, studies of the drinking behavior of minority women reveal variations within groups as well as among them (Collins and McNair, 2002). Alcohol could be underreported because of fear of legal action, interventions from child protective services, or because clients have had bad experiences with health-care professionals not trained in the treatment of alcohol, tobacco, and other drug use (Curet, and His, 2002).

In a study to measure the pregnancy-related reduction in the prevalence of reported binge drinking (≥ 5 alcoholic drinks per occasion) and to characterize binge drinkers among pregnant and nonpregnant women aged 18-44 years in the United States, 1991 – 1995. The BRFSS data from 46 states was used. Between 1991 and 1995, the
prevalence of binge drinking among pregnant women increased significantly from 0.7% to 2.9%. Over the study period, pregnant women were one-fifth as likely as nonpregnant women to binge drink. However, among various population subgroups of women, pregnancy-related reduction in binge drinking was smallest among black women and largest among women below 30 years (Ebrahim, Diekman, Floyd, and Decoufle, 1999).

Because women in this study were familiar with their resource mother and the researcher, women may not have underreported alcohol use. There is a possibility that alcohol as well as drug use could be low. In 2002, alcohol and drug use by Africans Americans was lower than any other group (SAMHSA, 2002).

According to the data from the state of Georgia, very few WIC clients reported using alcohol, Southside = 0.6% (02); Grady = 0% (0); all other mothers statewide = .44% (214), and using drugs, Southside = 4.4% (16); Grady = 3.9% (6); all other mothers statewide = 3.97 (1,963). This data set was consistent with data collected from the interviews with the WIC clients, in the present study few clients reported alcohol and drug use during their interviews.

Alcohol and marijuana use could have been underreported in this study because so few women reported using cigarettes, alcohol, and other drugs. Women failed to report alcohol and marijuana for fear of legal action or interventions from child protective services. Also, many had bad experiences with health-care professionals not trained in the treatment of alcohol, tobacco, and other drug use (Curet, and Hsi, 2002).

Furthermore, in many states, delivery of a drug-positive infant resulted in legal sanctions that include termination of parental rights and criminal prosecution (Office of Women’s Health, 2001). Eighteen states have amended their civil child welfare laws to address
specifically the subject of a woman’s drug use during pregnancy. These laws vary considerably; in some states a pregnant woman’s drug use has triggered only an evaluation of parenting ability and the provision of services, whereas in others it has provided the basis for presuming neglect or qualified as a factor to be considered in terminating parental rights (Office of Women’s Health, 2001).

6.5.2 Fear of Legal Interventions

Patient self-reports of alcohol consumption, can be influenced by characteristics of the patient, provider, or clinical encounter and may have caused both underreporting and over reporting (Brown, Kranzler, DelBoca, 1992). Pregnancy adds to the unfounded social stigma of being alcohol/drug dependent, which may have caused a woman from entering treatment. This stigma also may have prompted pregnant women to conceal substance use, which makes identification and intervention difficult. In fact, many alcohol-and drug-abusing women have avoided prenatal care altogether (Miles, Svikis, Kulstad, and Haug, 2001).

The rates at which pregnant drug-using women have entered treatment vary widely, said Miles, depending upon availability of services, practitioner attitudes and legal consequences. Also, in many alcohol and drug treatment programs, pregnant women are not accepted because of liability issues or a lack of knowledge about pregnancy (Mitchell, 1993).

6.5.3 Underreporting as a Problem

Previous studies have found underreporting of alcohol and marijuana use to be a problem. It has been suggested that women underreport prenatal alcohol use when they are interviewed during pregnancy, compared with interviews conducted retrospectively
after delivery (Sood, Delaney-Black, Covington, Nordstrom-Klee, Ager, Templin, Janisse, Martier, and Sokol, 2001). Because of the social stigmatization associated with heavy alcohol consumption, some women may underreport alcohol use. Therefore, the self reported data may be subject to both recall and reporting biases (CDC, 1997).

In a study in regards to binge drinking, only 5% of pregnant women reported having a binge-drinking episode. These findings were especially telling since the binge drinking rates did not vary significantly between depressed and non-depressed women during the year prior to conception or during the period between conception and pregnancy recognition (LA Info, 2002).

6.6 Did the Resource Mothers Program reduce drug use?

Almost all clients reported that they did not use street drugs. The few women who did report drug use reported smoking only marijuana and not using any other drugs. In this study, street drug use was a risk factor for low-birth weight.

Even though there were few reports of street drug use for this study, the variable was significant in the logistic regression Model 2 (all variables included with the exception of education and alcohol) and Model 3 (backward elimination), for all mothers. For black mothers, street drug use was significant for the unadjusted odds ratio, Model 2 (all variables included with the exception of education and alcohol) and Model 3 (backward elimination).

It was likely that the prevalence of drug use was similarly slow for clients who live in the catchment areas of Southside and Grady. Many of these women lived in neighborhoods where crack cocaine was highly prevalent. It was very unlikely for pregnant women on crack cocaine to enter or enroll in a WIC clinic. These women were
on the street constantly looking for drugs and not really thinking about their care, prenatal care, or how to take care of their unborn infant. In fact, many drug abusing women avoid prenatal care altogether (Miles, Svikis, Kulstad, and Haug, 2001). The rates at which pregnant drug-using women seek treatment vary widely, depending upon availability of services, practitioner attitudes and legal consequences. Also, many drug treatment programs do not accept pregnant women because of liability issues or the lack of knowledge about pregnancy (Mitchell, 1993). Besides, the WIC clinics were ill equipped to handle pregnant women on drugs. A prenatal drug screen at Southside Medical Center found that approximately ten percent of the pregnant mothers were using street drugs (Southside Healthcare, Inc., 1999).

6.6.1 Review of Previous Research

In a study that screened for substance use in pregnancy, researchers used self-report of drug use as valid evidence of whether a woman actually used substances. After ensuring clients confidentiality, researchers determined that the estimate of the prevalence of drug use by clients was only 4.6%, which was consistent with the 1994 National Household Survey on Drug Abuse (Chasnoff, Neuman, Thornton, and Callaghan, 2001).

As with alcohol, clients may have been reluctant to report drug use because of the problems that may arise from legal action or interventions with child protective services; or because of mistrust in the health care system. In many states, a newborn drug-positive
infant resulted in legal sanctions that included termination of parental rights and criminal prosecution (Harrell and Goodman, 1999).

6.7 Did the Resource Mothers Program Improve Nutritional Status?

Nutrition was one of the most important components of the program. The resource mothers’ clients and the non-resource mothers’ clients received similar messages from their physicians, resource mothers, and WIC staff regarding nutrition. The common messages received from the client was that they were told to: (a) eat nutritious and healthy foods; (b) avoid unhealthy foods, such as sweets, fried foods, and foods in fast food restaurants; (c) prepare nutritious and healthy foods; (d) drink plenty of liquids, such as water, milk, and juices; and (e) get enough to eat, for instance, some of the clients had poor eating habits which consisted of not eating regularly, not eating at all some days, and not including vegetables in their diet.

Clients were lectured on the importance of eating nutritious and healthy foods, unhealthy foods to avoid, preparing nutritious and healthy food. These clients learned the different food groups, how to prepare foods correctly, and what proportions of the different foods were needed in order to maintain a healthy diet. Eating healthy meant to eat foods from the five healthy food groups such as: grain products, vegetables, fruits, protein foods, milk and milk products.

The resource mothers monitored the way clients prepared and cooked their food. They also visited the homes of clients from time to time to make sure they were eating properly. The basis dietary guidelines for maintaining good health during pregnancy were basically to follow the food guide pyramid and to maintain a healthy weight range that included exercise (Galeaz, 2002).
Most mothers at Southside and Grady were enrolled in the WIC program because of their high nutritional risk status. However, there was no significant difference found in the quantitative analyses between the percentage of mothers at high nutritional risk at Southside and Grady. Nutritional risk was not found to be a risk factor for low-birth weight in the logistic regression analysis. However, in the qualitative analyses, the clients and resource mothers both thought that the Resource Mothers Program was very instrumental in helping clients to improve their nutritional habits. Clients were eating better and maintaining a healthy diet.

6.7.1 Review of Previous Research

Several studies have been developed to improve nutrition among pregnant women. For example, in a study of pregnant women in North Carolina, dietary information was collected with the use of a food frequency questionnaire during clients second trimester. The purpose of the study was to identify foods that contributed most to nutrient and fiber intake in a sample of pregnant women. The study relied on pregnant women receiving nutritional education messages from health care providers, family members, and popular magazines to encourage clients to eat healthy diets. The study found that low nutrient-dense foods were major contributors to energy, fat, and carbohydrates, whereas fortified foods were important sources of iron, folate, and vitamin C (Siega-Riz, Bodnar, and Savitz, 2002).

A second study was developed to investigate the relationship between WIC food supplement participation, low-birth weight and infant mortality. The results of the study indicated nutritional benefits to the WIC program. Mothers receiving WIC
supplementation were less likely to have no weight gain or an inadequate weight gain during their pregnancy (Brown, Watkins, and Hiett, 1996).

The National Cancer Institute-funded study of the WIC program in Maryland sought to increase fruit and vegetable consumption among women served by the program. Over a two year period, a multifaceted intervention program using a randomized crossover design sought to increase fruit and vegetable consumption among women served by the WIC program. After two months, the mean daily consumption had increased. The intervention participants showed greater change in the stages of change, knowledge, attitudes, and self-efficacy (Havis, Anliker, Damron, Langenberg, Ballesteros, and Feldman, 1998).

The North Carolina study served families of young child, and began home visits immediately following the birth of the child. This study used a food frequency questionnaire to identify foods that contributed to nutrient and fiber intake in a sample of pregnant women. Clients in this study received education messages from health care providers, family members and popular magazines. The second study to investigate the relationship between WIC food supplementation, educated clients regarding nutrition. This study, funded by the National Cancer Institute, sought to increase fruit and vegetable consumption among WIC women. However, the Southside and Grady study used the resource mothers and WIC staff to educate and train clients regarding nutrition, buying healthy food, healthy eating, preparing nutritious foods, and the proportions of food needed at each meal. These resource mothers actually told clients what foods to eat, what proportions to eat, how often to eat and showed them how to prepare their food. Some resource mother helped clients with transportation to the grocery store, showed them
what foods to buy, and sometimes bought food for them. The clients were formally trained in the WIC classes; as well as by the nutritionist and resource mother regarding nutrition.

6.8 **How did the Resource Mothers Program Provide Social Support?**

According to the clients and resource mothers, social support was also one of the most important aspects of the Resource Mothers Program. The clients greatly depended on the resource mothers for social support. Numerous studies have shown that when social support is high, the risk of mortality is reduced after controlling for various measures of health status and demographic characteristics (Rogers, Peoples-Sheps, and Suchindran, 1996). All twenty resource mothers’ clients greatly benefited from the emotional, instrumental, informational, and appraisal support provided by the resource mothers.

Emotional support involved the provisions of empathy, love, trust, and caring. Instrumental support was support in the form of tangible aide and services. Informational support was the provision of advice, suggestions and information that a person could use in addressing problems. Appraisal support was providing constructive feedback, affirmation, and social comparison to the clients for self-evaluation purposes (Heaney and Israel, 1997).

6.8.1 **Emotional Support**

The resource mothers provided the Southside WIC clients with many forms of empathy, love, trust, and caring. They viewed themselves as an extended part of the clients’ families. Clients reviewed the resource mothers as a part of their family as well. The resource mothers’ clients and the non-resource mothers’ clients felt that the resource
mothers were doing an outstanding job by establishing trusting relationships with the clients. Clients respected and trusted the resource mothers.

Clients stated that they could always call on the resource mothers. They thought that the resource mothers’ were like real mothers. Also, some clients thought that the resource mothers were role models for the clients and community.

6.8.2 Emotional Support - Review of Previous Research

In a prospective study that interviewed teenage mothers, social support was assessed as support from family, friends, and fathers of the babies. The outcome variable was birth weight, controlling for gestational age. Family support had a small but statistically significant association with birth weight; and the four social support measures (loss of a spouse, adequacy of emotional support, loss of a confidant, and number of weekly visits from children) explained about 7% of the variance in birth weight (Berkman, 1995).

In a study to strengthen the social networks of pregnant women, an intervention group received 4 home visits from either a nurse or social worker. There were no significant differences in low-birth weight or preterm birth outcomes between the intervention and control groups (Villar, Farnot, Baros, Victora, Langer, and Belizan, 1992).

Another study conducted, in a hospital in Houston, Texas recruited 412 women to participate and receive a supportive companion or neutral observer during labor and delivery. An additional 204 women were selected as a control group with neither the supportive companion nor observer. The duration of labor was shorter for the supported groups, caesarean deliveries were less common in the supported groups, and neonatal and
maternal health outcomes, such as maternal fever or sepsis evaluation for the neonate, were also reduced among the intervention group (Kennell, Klaus, McGarth, Robertson, and Hinkley, 1991).

In 1983, Norbeck and Tilden reported findings from an observational study about the associations between tangible and emotional support with pregnancy complications. Social support was measured by questionnaire between 12 to 20 weeks gestation, and life events were measured about 6 weeks by questionnaire between 12 and 20 weeks gestation, and life events were measured about 6 weeks prior to delivery. Eighty-four percent of eligible women participated in the study (n = 117). Neither was tangible or emotional support independently associated with any types of complications. However, among women with elevated life change scores, low support was associated with higher risk of gestational and infant complications. These findings suggested a stress-buffering role for social support. It appeared that in the presence of high life change scores, high social support exerts a protective effect upon pregnancy complications (Orr, 2004).

As stated previously, the Southside and Grady project was housed inside WIC clinics and was not a home visitation program as studies in the past. Instead of assessing emotional support received from family, friends and fathers of babies, the resource mothers served as extended parts of clients’ families, serving also as role models. Maybe the resource mothers could have served as supportive companions or observers during
labor, and received better results for the program. However, there were not many resource mothers housed at Southside to serve in this role.

6.8.3 Instrumental Support

The resource mothers provided the clients with tangible aide and services, such as help with food, clothing, shelter, transportation, and items for their babies. When resource mothers were not able to provide a service or tangible aide, they would call upon social service organizations. Many clients stated that the resource mothers helped them to obtain food, clothing for the baby, items for the baby, shelter, tokens for the bus, day care, money, and getting into technical school or college.

6.8.4 Instrumental Support - Review of Previous Research

Other studies have focused on activities for pregnant women using instrumental support. A study was conducted in Alabama with pregnant African-American women on Medicaid. The intervention group received instrumental support, (transportation, childcare). Overall, there were no statistically significant differences in low-birth weight or preterm outcomes between the intervention and comparison groups. However, women in the intervention group were more likely than women in the comparison group to report smoking cessation and greater satisfaction with prenatal care (Klerman, Ramey, Goldenberg, Marbury, Hou, and Cliver, 2001).

The North Carolina Maternal Outreach Work Program study found that pregnant women needed instrumental types of support (transportation, money, housing) more than informational support (support from relatives and friends). Information support needs
were being met by sources other than home visitors (Navaie-Waliser, Martin, Campbell, Tessaro, Kotelchuck, and Cross, 2000).

In a study of the Resource Mothers Program for Maternal Phenylketonuria, resource mothers met with pregnant women for approximately 20 sessions of 2 hours each, weekly in the beginning and less frequently as the pregnancy proceeded. Activities included shopping, meal planning, preparing for the baby, talking about the pregnancy, and discussing medical recommendations (St. James, Shapiro, and Waisbren, 1999).

At Southside, resource mothers did far more than provide transportation and childcare. They provided clients help with food, clothing, shelter, transportation, and items for their babies. Resource mothers also helped clients with daycare, money, and enrollment in technical school or college. Not only did they help out with money, but they also transported clients to the grocery store and bought food for them. These resource mothers provided very effective avenues for clients to maintain their daily living and to better themselves. Even though many things that the resource mothers did was not part of their job description, the resource mothers went out of their way to help the clients improve their lives.

6.8.5 Informational Support

Clients received advice, suggestions, and information from the resource mothers. The resource mothers served as a sounding board for the clients, giving them information and advice that helped the clients improve their health behaviors and health status during pregnancy. The resource mothers provided clients with information about smoking, alcohol, and drugs. Clients attended WIC classes and RAP sessions that gave them information on the hazards of smoking, using alcohol and drugs during pregnancy and
after pregnancy. They received statistics on poor birth outcomes, and were told what these different statistics meant.

6.8.6 Informational Support - Review of Previous Research

In a study among pregnant teenagers in South Carolina, resource mothers were employed to provide social support through home visitation, including information about pregnancy and community services. The birth records of 565 participants were compared with those of a matched group of controls selected using the stat vital statistics system. The control was matched on race, age, and year of delivery. The rate of low-birth weight among the participants was significantly lower than among the matched controls (Heins, Nance, and Ferguson, 1987).

A study was conducted in a public prenatal clinic of a university-affiliated hospital to assess the relationship between prenatal social support and birth weight among 129 women, ages 18 years and older. One component of the program was to assess informational support in the form of provision of advice, as well as listening. The study identified two types of informational support, which were providing (a) material aide and (b) advice or information. The results of the study indicated that women who received more material support tended to be less depressed after childbirth (Collins, Dunkel-Schetter, Lobel, and Scrimshaw, 1993).

Like the Southside and Grady study, the studies in South Carolina and the prenatal clinic provided information about pregnancy and community service, provisions of advice, listening, and material aid to clients. However, unlike the previous studies, Southside and Grady provided advice, suggestions and information 24 hours a day. Not only could the clients come into the clinic to talk with the resource mothers, they could
contact the resource mothers day or night to obtain advice and information. Resource mothers also visited clients at night and on the weekends.

6.8.7 Appraisal Support

The resource mothers provided the clients with constructive feedback regarding their health behaviors and interests. They let the clients know when they were on the right track and when they needed to make improvements in their lives or behavior.

6.8.8 Appraisal Support - Review of Previous Research

In a study to test a latent prenatal social support factor and fetal growth, pregnant women enrolled at 28 to 30 weeks gestation completed interviews which assessed appraisal support and other kinds of support. The study used the Interpersonal Support Evaluation List, which is a standard measure of social support that has been used in pregnancy research, to measure support functions. In this study, appraisal support was evaluated on the basis of how well the baby’s father and family members provided the client with constructive feedback, affirmation and comparisons for the clients’ self evaluation. The study found that appraisal support was one of the factors associated with birth weight (Feldman, Dunkel-Schetter, Sandman, and Wadhwa, 2000).

In a study regarding stress, appraisal, coping, and social support, family caregivers of dementia patients were recruited from a variety of community resources to determine if the use of social support was important in coping with chronic stress. The study found that women high in appraisal support, which was defined as the availability of others with whom to speak about one’s problems, showed lower baseline levels of
systolic blood pressure and diastolic blood pressure than women who were low in appraisal support (Haley, Levine, Brown, Bartolucci, 1987).

At Southside, resource mothers provided constructive feedback and affirmation to clients regarding their health behaviors and interests. They assessed clients’ needs, improvements, and progress, and discussed these issues with the clients.

6.9 **Was the Resource Mothers Program Effective for Mothers at all Ages?**

Data for the quantitative analysis was captured from the WIC data set for years 1999 and 2000. During this period of time, all clients at Southside Medical Center were eligible to utilize the services of the Resource Mothers Program. Beginning year 2001, the Resource Mothers Program at Southside only enrolled teenagers between the ages of 14 to 20 years. However, pregnant teenagers under the age of 14 were also eligible for the Resource Mothers Program.

There were three hypotheses for this study regarding age. These hypotheses stated that there was no difference in the birth weight of infants born to mothers at Southside’s WIC clinic who were below the age of 20 years, ages of 20 to 34 years, and 35 years or more; and those mothers at Grady Memorial’s WIC clinic who were below the age of 20, ages 20 to 34, or 35 years or more. Of the three age categories for women in this study, age 35 years or more was found to be statistically significant in the logistic regression models. Age 35 years or more was a risk factor for low-birth weight.

The program was very beneficial for teenagers below the age of 20 and for women ages 20 to 34 years. As can be noted, women below 20 and women age 20 to 34 were not risk factors for low birth weight. Women age 35 years or more are a unique case in itself. Compared to the general population, infants born to women aged 35 and
older were significantly likelier to be low-birth weight infants and to be born before 37 weeks completed gestation (Bowes, 2002).

The non-resource mothers’ clients could have continued to benefit from the Resource Mothers Program because their experiences during pregnancy were similar to those clients who were involved in the program. Women of all ages thought that the program had helped them much, and that the program was excellent.

6.9.1 Review of Previous Research

Michaels (2000) conducted a study with 40 young urban teenagers receiving publicly funded prenatal care. It was perceived that pregnant teenagers faced limited options and were not always aware of the services available to them. Three themes emerged from the qualitative interviews with these teenagers: (1) The web of publicly funded medical coverage was far too complicated for the teens to understand. Their lack of knowledge about their insurance plans often resulted in substandard care. (2) The teens had needs that extended beyond the confines of the examination room, needs that were sometimes met with the help of the clinic social workers and counselors. (3) Finally, respect was as important in this realm as it was in the patient-doctor relationship. Physical facilities, staff attitudes, and the stigmatization the girls experienced in the waiting room all contributed to their health care experience.

In order to determine whether full-term, healthy infants born to early adolescent mothers (15 years old and younger) were at higher risk of low birth weight compared with infants of adult mothers, comprehensive 1996 and 1997 United States birth cohorts were compared. The study found that the postneonatal mortality rates born to mothers 15 years old and younger were substantially higher than that of infants born to mothers...
23-29 years old; and remained substantially higher after adjusting for maternal race or ethnicity (Phipps, Blume, and DeMonner, 2002).

A study by Raugh and others found that African Americans and the poor at 20 years of age carry meaningful reproductive risks. Also, the Centers for Disease Control and Prevention collected data on death caused by pregnancy and its complications, women aged 35-39 years had a higher pregnancy-related mortality ratio than younger women. Women aged 40 years and older had an even higher pregnancy-related mortality ratio (Callaghan and Berg, 2003).

The literature shows that programs and interventions were needed for pregnant teenagers. However, literature also shows that pregnant women of all age groups could benefit for the Resource Mothers Program.

6.10 Conclusions

The Resource Mothers Program at the Southside Medical Center was a promising mechanism that could help reduce health disparities among African Americans. This program seemed to work because of the nutritional interventions and social support provided by the resource mothers. The resource mothers helped clients cope with being pregnant, listened to their problems, gave them advice, obtained food, clothing, housing and things needed for their babies. They provided a buffering effect for the WIC mothers.

As with other research, the risk factors for this study were not being in the Resource Mothers Program, black/non- Hispanic race, age 35 years and older, high school graduates or less, street drug use, and living in a household of one to three persons. These risk factors were similar to other studies, with the exception of living in a
household of one to three persons. However, this study deals with unmarried women
who may be living in a household alone or in their mother’s home who may be a single
parent. Unmarried women and single family households face the same problems as those
living in larger households.

The Southside Medical Center reported lower rates of low-birth weight than any
other group in the study. The main difference among the three groups of clients was the
Resource Mothers’ Program. All three groups of clients basically had the same
characteristics.

6.11 Limitations of Study

The limitations of the study were as follows: 1) the resource mothers interviewed
for this study were volunteers who consented to participate in this study; there could be
differences in this self reported data between participating and nonparticipating resource
mothers. 2) the study was limited by any incompleteness or inaccuracies in this
self-reported data from the State of Georgia’s WIC Program; 3) since the data used for
quantitative analysis was transcribed by clerks from patients’ self reported records, there
may have been some errors made in recording this information or in the patients
self-reports; 4) secondary data used for this study were obtained from the Southside
Medical Center and the Grady Memorial Hospital, which may not be representative of the
entire State of Georgia’s WIC program; 5) missing data for some of the variables in this
study could have limited the amount of detectable change in the study groups; 6) because
natural subgroups of the State of Georgia’s WIC Program were used for this study, the
study is non-random and may be limited in generalizability; and 7) because there were no
data found for some of the variables among the data set that was obtained from the State
of Georgia’s WIC Program, the research was limited to the variables that did actually exist.

Limitations for this study do exist but do not totally undermine validity. In response to the first limitation, four of the five resource mothers currently participating in the program were interviewed for this study. The fifth resource mother was fairly new to the program, and did not fully understand the scope and nature of the program. The second and third limitations are addressed because the researcher reviewed 211 patient charts that the resource mothers kept on their clients, and the data included in the charts matched the WIC data set. This matching of information does show that the data were reliable and accurate and resolved any limitation of the study dealing with the inaccuracies of the data and recording errors. Also, the fourth, fifth, sixth and seventh limitations are addressed because of the fact that a number of studies had been conducted utilizing WIC data. In a study by Kreiter and others in 2000, data from the study were obtained from the North Carolina Women, Infants, and Children Program (WIC). In a study by Kendal and other in 2002, a state WIC data set as well as a Medicaid data set in Detroit, Michigan was used to determine if the health of Medicaid patients were improved by collocating special supplemental nutrition clinics with managed care provider sites. Also, missing data was only substantial for the variable, education.
Because of the large amount of missing data for the variable education, analyses were conducted without it.

6.12 Recommendations for Future Research

The following recommendations were offered for related research pertaining to WIC data.

(1) Occasionally while interviewing a client, the clients had to talk with staff members at the WIC clinic. Sometimes this was distracting to the clients, and it created less time for the interview.

Recommendation:

Future researchers should consider interviewing clients during non-clinic hours, in order to allow more time for the interviews and to allow clients to feel more comfortable and relaxed. It would be better to interview clients after hours or away from the clinic.

(2) Because of the lack of time during the interviews, the researcher was not able to adequately probe the clients to obtain additional information about the Resource Mothers Program or the WIC clinic. The clients were not given adequate time to express their feeling and to give all their opinions regarding the program.

Recommendation:

Researchers carrying out future studies should allow adequate time to probe clients, in order to obtain a full description of clients’ feelings and thoughts about the program.

(3) In reviewing the client’s records at the WIC clinic, the data was not filed in an orderly fashion and had no consistent format. There was no record of missed
appointments kept in the clients’ WIC records. Also, there were two sets of WIC
records, one record kept in the file room at the WIC clinic and another record kept
by the resource mothers.

Recommendation:
State WIC programs, health care practitioners, and health care facilities should
develop better methods to record services of clients and to establish adequate
procedures for handling missed appointments.

6.13 Recommendations for Practice
The following recommendations are offered for related research in the field of
public health.

(1) State WIC programs should improve the availability and quality of their data and
research methods to allow for program evaluations.

(2) State WIC programs, health care practitioners, and health care facilities should
perform research to better understand the problems that cause low-birth weight and
the solutions for improving the problems.

(3) The federal government should implement policies that would promote Lay Health
Advisor/Resource Mothers Programs in WIC clinics throughout the United States.

(4) As well as reviewing biological and medical risk factors for low-birth weight,
researchers should include the variables, nutrition and social support, in their
research activities.
Appendices
Appendix A: Tables Listed In Chapter 1 – Introduction
## The Grady Memorial Hospital and Southside Medical Centers

### WIC Clinics

<table>
<thead>
<tr>
<th><strong>GRADY MEMORIAL HOSPITAL WIC CLINIC</strong></th>
<th><strong>SOUTHSIDE MEDICAL CENTER WIC CLINIC</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Is located in a large Metropolitan hospital in the heart of downtown Atlanta.</td>
<td>1. Is located in a small neighborhood community center.</td>
</tr>
<tr>
<td>2. The clinic has a total of 7,261 clients.</td>
<td>2. The clinic has a total of 4,857 clients.</td>
</tr>
<tr>
<td>3. The total number of infants on record at the clinic is 16 clients, because are referred to other clinics after birth.</td>
<td>3. The clinic serves a total of 1,057 infants.</td>
</tr>
<tr>
<td>4. There are 3,631 children seen in the WIC clinic.</td>
<td>4. There are 2,964 infants seen at Southside.</td>
</tr>
<tr>
<td>5. Grady serves 3,614 women in the program.</td>
<td>5. Southside’s WIC program serves 835 women.</td>
</tr>
<tr>
<td>6. Eight nutritionist are on staff at Grady.</td>
<td>6. Two nutritionist serve the WIC clinic.</td>
</tr>
<tr>
<td>7. Grady employees 11 staff persons, other than the nutritionist.</td>
<td>7. Southside has three employees other than the nutritionists.</td>
</tr>
<tr>
<td>8. Grady has four WIC clinics throughout the city of Atlanta.</td>
<td>8. Southside has only one clinic.</td>
</tr>
<tr>
<td>9. Most of the WIC clients at Grady are referred into the program.</td>
<td>9. Most of Southside’s WIC clients are referred by word of mouth.</td>
</tr>
<tr>
<td>10. WIC’s staff consists of a diverse group of people</td>
<td>10. WIC’s staff consists mostly of African Americans.</td>
</tr>
<tr>
<td>11. WIC clients deliver their babies at the facility.</td>
<td>11. Southside’s babies are delivered in hospitals throughout Atlanta.</td>
</tr>
<tr>
<td>12. After delivery, clients and babies are referred to other WIC facilities.</td>
<td>12. Clinic continues to follow clients and babies.</td>
</tr>
<tr>
<td>13. Grady does not have a Resource Mothers Program.</td>
<td>13. Southside has a Resource Mothers Program.</td>
</tr>
<tr>
<td>14. Activities for clients at Grady consist of talking with the nutritionist.</td>
<td>14. Southside provides outreach activities to their clients and families.</td>
</tr>
</tbody>
</table>

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**Table A.1: The Grady Memorial Hospital and Southside Medical Center’s WIC Programs.**
The Resource Mothers Interview Guide

Thank you for agreeing to be a participant of this study. Your opinion is very important, so please feel free to share your point of view. There are no right or wrong answers. You may be assured of confidentiality. As you know, your participation is voluntary. You may choose to withdraw from the interview at any time. You will be guided along the interview.

Research Question: To what extent does the Resource Mothers Program help to reduce low birth weight among the WIC infants?

1. Tell me how you became involved in the Resource Mothers Program?  
   (Did you hear about it in the community? What made you interested in the program?)

2. Tell me what Resource Mothers do at the Southside Medical Center’s WIC Program?  
   (What sorts of things do you do for the WIC clients? Are there other things that you do for the clients?)

3. What do you think helps the clients?  
   (Can you give me some examples? How do you think that what you do helps the clients?)

4. What are some of the ways that you use to educate the mothers about their pregnancy?  
   (Can you give me some examples of how it has worked or how it has not helped?)

5. What is it about the program that you think could be done better?  
   (If you could change some things about the program, what would you do to change it?)

Table A.2: The Resource Mothers Interview Guide
The Clients Interview Guide

Thank you for agreeing to be a participant of this study. Your opinion is very important, so please feel free to share your point of view. There are no right or wrong answers. You may be assured of confidentiality. As you know, your participation is voluntary. You may choose to withdraw from the interview at any time. You will be guided along the interview. Remember, what we are interested in are the things that have happened to you in the WIC program or during your pregnancy? Do you have any questions before we begin?

Research question: To what extent does the Resource Mothers Program help to reduce low birth weight among the WIC infants?

1. Tell me how you came to seek care at this clinic? (Tell me about it.)
2. What sorts of things did the doctor say would keep you healthy? (Give examples)
3. What sorts of things have you learned in this clinic that would keep you healthy? (Give examples)
4. What sorts of changes have you made since you became pregnant? (Give examples)
5. Since becoming pregnant, what habits have been easier for you to change? (Give examples)
6. What has been the hardest for you to change? (Give examples)
7. Tell me about your pregnancy? (Give examples of what has happened)
8. People often have to miss clinic appointments, have you ever had to skip or reschedule an appointment? (If yes, tell me about what happened. If no, why do you think some women are able to keep their appointments more easily than others?)
9. How has being involved in the WIC clinic helped you personally? (Give examples)
10. Who helps you deal with your pregnancy outside the clinic? (Give examples of how they have helped you.)
11. Tell me about people with whom you can talk to during stressful times? (Why are these people easier to talk to than others? Why do you think that you can talk with these people? What other things do these people do for you?)
12. What do you think about the Resource Mothers’ Program? (Tell me about it.)
13. What has been most helpful about the Resource Mothers’ program? (Tell me about it.)
14. If there was anything that you could do to change the Resource Mothers’ Program, what changes would you make? (Tell me about it.)

Table A.3: The Clients Interview Guide
Appendix B: Tables Listed In Chapter 2 – Review of Literature
<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely Low Birth Weight (ELBW) Infants</td>
<td>Those infants who weigh less than 100 grams at birth (Gould, J.B., Benitz, W.E., and Liu, H., 2000).</td>
</tr>
<tr>
<td>Fatal Alcohol Syndrome</td>
<td>A specific pattern of congenital malformations that is recognized as the leading cause of mental retardation. The effects of both smoking and alcohol consumption on fetal birth weight are dose dependent (York, R., Brooten, D., 1992).</td>
</tr>
<tr>
<td>High Risk Nutrition</td>
<td>A patient diagnosed of clinical signs of nutritional deficiencies or a disease caused by insufficient dietary intake of macro or micro nutrients. Diseases include, but not limited to: protein energy malnutrition, hypocalcemia, cheilosis, scurvy, osteomalacia, menkes disease, rickets, vitamin K deficiency, xerophthalmia, beriberi, and pellagra (Georgia WIC Program, 2001).</td>
</tr>
<tr>
<td>Low Birth Weight (LBW) Infants</td>
<td>Infants born weighing less than 2500 grams (5.5 pounds or less at birth). LBW infants are admitted to neonatal intensive care units at a higher rate than normal birth weight infants and are more susceptible to illnesses, such as lower respiratory tract infections. As a result LBW infants, on average, require more expensive care than normal birth weight infants (U.S.D.H.H.S., 1997).</td>
</tr>
<tr>
<td>Normal Birth Weight (NBW) Infants</td>
<td>Those infants that weight more than 5.5 pounds at birth. These infants have fewer health problems at birth, than those babies who are born with a low birth weight (Hay, W.W., Lucas, A., Heird, W. C., Ziegler, E., Levin, E., Grave, G.D., Catz, C.S., and Yaffe, S. J., 1999).</td>
</tr>
</tbody>
</table>

Table B.1: Definition of Terms (Continued)
Table B.1: Continued

<table>
<thead>
<tr>
<th>Nutritional Risk</th>
<th>An eligibility criterion for pregnant women to receive WIC services. To receive WIC services, program participants must meet income guidelines, state residency requirements and be determined to be at nutritional risk. The two types of nutritional risk recognized by WIC eligibility guidelines are: medical risk – such as anemia, metabolic disorders, maternal age, history of pregnancy complications, or poor pregnancy outcomes; and dietary risk refers to inadequate dietary patterns, such as missing any food group based on the recommended daily servings chart, failure to meet the recommended number of servings for two (2) food groups and practice of two (2) inappropriate food practices based on the inappropriate food practices list. Nutritional risk must be determined by a competent health professional such as a physician, nutritionist or nurse, and is based on federal program regulations. Nutritional risk means: (a) detrimental or abnormal nutritional condition detectable by hematological or anthropometric measurement; (b) documented nutritionally related medical conditions; (c) dietary deficiencies that impair or endanger health; or (d) conditions that predisposes a person to inadequate nutrition patterns and/or nutritionally related medical condition (Georgia Department of Human Resources, 1998).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postpartum Women</td>
<td>Refers to women up to six months after giving birth to a child (United States Drug Administration, 1999).</td>
</tr>
<tr>
<td>Resource Mothers Program</td>
<td>A program that gives support to pregnant teens and young mothers. The program teaches young mothers positive parenting skills and empowers them so that they can face life’s challenges. It helps link young women and mothers to healthcare services such as prenatal care, well baby care, immunizations, etc. The program provides referrals to social services such as Temporary Assistance for Needy Families (TANF), food stamps, and the Women, Infants, and Children (WIC) Program.</td>
</tr>
</tbody>
</table>

(Continued)
### Table B.1: Continued

<table>
<thead>
<tr>
<th>Street Drug Use</th>
<th>The name given by the WIC Program for any illegal drug use, including but not limited to marijuana, cocaine and cocaine derivatives, heroin, amphetamines, tranquilizers, and barbiturates.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Low Birth Weight (VLBW) Infants</td>
<td>Infants who are born weighing less than 1500 grams (3.3 pounds) (Gould, J.B., Benitz, W.E., and Liu, H., 2000). The VLBW rate has increased slightly since 1990 among whites and other population groups including African Americans, Puerto Ricans, and American Indians. VLBW is usually associated with preterm birth. Relatively little is known about risk factors for preterm birth, but the primary risk factors are prior preterm birth and spontaneous abortion, low prepregnancy weight, and cigarette smoking. These risk factors account for only one-third of all preterm births. Maternal use of illicit drugs also may increase the risk of VLBW (U.S.D.H.H.S., 2000).</td>
</tr>
<tr>
<td>Weight Gain</td>
<td>Refers to the amount of weight a mother gains during pregnancy (Georgia Department of Human Resources, 2000).</td>
</tr>
</tbody>
</table>
Appendix C: Tables Listed In Chapter 3 – Methodology
Table C.1: Georgia WIC Program Turnaround Document
Table C.2: Georgia WIC Program Assessment Variables
RECRUITMENT SCRIPT FOR THE RESOURCE MOTHERS

I’m Karen Bouye, a doctoral candidate at the Ohio State University in Columbus, Ohio. We are conducting a study on Georgia’s WIC Program. The principal investigator for this study is Moon Chen, Jr., Ph.D., M.P.H., Professor and Chair, Division of Health Behavior and Health Promotion, in the School of Public Health at the Ohio State University. I am the co-investigator for the project. We are very interested in the Resource Mother’s Program here at the Southside Medical Center, and are trying to determine how the program helps to reduce low birth weight among the women in the program. In order to help determine this, we would like to conduct interviews with some of the Resource Mother’s and would like for you to participate in the interview. We cannot pay you for your time, but we would like to give you this key chain just for letting us introduce the study to you.

We would like to audiotape the interview sessions, and need your permission to audiotape your session. This interview will take about 20 or 30 minutes. Your identity will be kept confidential and will not be recorded. Also, your discussion will not be linked to you in any way. If you are willing to let us audiotape your interview, please sign this document on the signature line below.

I will confirm your participation with a letter containing the exact location of the interview. If you have any questions concerning your participation, please feel free to call: Dr. Moon Chen, Jr., at (614) 293-3908 or Karen Bouye at (404) 639-4313.

Permission to Audiotape:

Signed: ___________________________ Date: ___________________________

Table C.3: Recruitment Script for the Resource Mothers
Consent for Participation in Social and Behavioral Research

I consent to participating in research entitled: An Examination of Low Birth Weight Infants in a Clinical and Community Setting in the Women, Infants, and Children (WIC) Program in Atlanta, Georgia.

Moon S. Chen, Jr., Ph.D., M.P.H., principal investigator, Professor and Chair, Division of Health Behavior and Health Promotion, School of Public Health, Ohio State University or his authorized representative has explained the purpose of the study, the procedures to be followed, and the expected duration of my participation. Possible benefits of the study have been described, as have alternative procedures, if such procedures are applicable and available.

I acknowledge that I have had the opportunity to obtain additional information regarding the study and that any questions I have raised have been answered to my full satisfaction. Furthermore, I understand that I am free to withdraw consent at any time and to discontinue participation in the study without prejudice to me.

Finally, I acknowledge that I have read and fully understand the consent form. I sign it freely and voluntarily. A copy has been given to me.

Signed:________________________________                 Date:__________________

(Participant)

Signed:________________________________

It has been explained to me that the principal investigator or his representative would like to audiotape the interviews. I give permission for my interview to be audio taped.

Signed:_________________________________ Date:___________________

Table C.4: Resource Mothers’ “Consent for Participation in Social and Behavioral Research Form”
Recruitment Script for Southside’s Clients

I’m Karen Bouye, a doctoral candidate at the Ohio State University in Columbus, Ohio. We are conducting a study on Georgia’s WIC Program. The principal investigator for this study is Kenneth J. Steinman, Ph.D., Professor, Division of Health Behavior and Health Promotion in the School of Public Health at the Ohio State University. I am the co-investigator for the project. We are very interested in the WIC Programs at Southside Medical Center and at the Grady Memorial Hospital, and are trying to determine how the programs help to reduce low-birth weight among the women in the program. In order to help determine this, we would like to conduct interviews with clients in the WIC Program at Southside Medical Center. We can not pay your for your time, but would like to give you a token of $10.00 just for letting us introduce the study to you.

Also, we would like to audiotape the interview sessions, but need your permission. The “Consent for Participation in Social and Behavioral Research Form” contains a signature line for you to sign in order for us to obtain permission to audiotape the interview. There will be only one interview conducted with the clients who volunteer, which will take about 20 to 30 minutes. Your name will be kept confidential and will not be recorded. Also, your discussion will not be linked to your name or you in any way.

If you have any questions concerning your participation, please feel free to call: Kenneth J. Steinman, Ph.D., at (614) 293-8632.

Table C.5: Recruitment Script for Southside Medical Center’s Clients
Consent for Participation in Social and Behavioral Research

I consent to participating in research entitled “An Examination of Low Birth Weight Infants in a Clinical and Community Setting in the Women, Infants and Children (WIC) Program in Atlanta, Georgia”. Kenneth J. Steinman, Ph.D., principal investigator, Professor in the Division of Health Behavior and Health Promotion, School of Public Health, Ohio State University or someone appointed by him has explained why the study is being done, what is expected from me, and how long the interview will last. I understand that there are no risks involved in the study, and the only benefit to me is to receive $10.00 just to thank me for doing the interview. I have also been told of any changes that will take place.

I acknowledge that I have had the chance to get more information about the study and that any questions I have asked have been answered to my full satisfaction. Furthermore, I understand that I am free to withdraw from the study and to stop answering the questions for the interview at anytime without anything happening to me.

Finally, I acknowledge that I have read and fully understand the consent form, and that the interview will be taped with a tape recorder. I sign the consent form freely and voluntarily. A copy has been given to me.

Signed: _______________________________ Date: _____________________________
(Patient)

Signed: _______________________________
(Principal Investigator or his authorized representative)

It has been explained to me that the principal investigator or his representative would like to audiotape the interviews. I give permission for my interview to be audio taped.

Signed: _______________________________ Date: _____________________________

Table C.6: Southside Client’s “Consent for Participation in Social and Behavioral Research Form”
### WIC Code List

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Referral Source</td>
</tr>
<tr>
<td>A11</td>
<td>Self Referral</td>
</tr>
<tr>
<td>A12</td>
<td>Referred to WIC by Southside</td>
</tr>
<tr>
<td>A13</td>
<td>Referred by a facility other than Southside</td>
</tr>
<tr>
<td>A14</td>
<td>Referred to WIC clinic by a family member</td>
</tr>
<tr>
<td>A15</td>
<td>Referred to WIC clinic by friends</td>
</tr>
<tr>
<td>A16</td>
<td>Other</td>
</tr>
<tr>
<td>B1</td>
<td>Access to Care</td>
</tr>
<tr>
<td>B11</td>
<td>Attend prenatal care appointments</td>
</tr>
<tr>
<td>B12</td>
<td>Never missed WIC appointments</td>
</tr>
<tr>
<td>B13</td>
<td>Missed appointment due to sickness</td>
</tr>
<tr>
<td>B14</td>
<td>Missed appointment due to lack of money</td>
</tr>
<tr>
<td>B15</td>
<td>Missed appointment because of traffic</td>
</tr>
<tr>
<td>B16</td>
<td>Missed appointment, lack of transportation</td>
</tr>
<tr>
<td>B17</td>
<td>Other</td>
</tr>
<tr>
<td>C1</td>
<td>Pregnancy Information</td>
</tr>
<tr>
<td>C11</td>
<td>Difficult pregnancy</td>
</tr>
<tr>
<td>C12</td>
<td>Gained lots of weight</td>
</tr>
<tr>
<td>C13</td>
<td>Sick or tired a lot</td>
</tr>
<tr>
<td>C14</td>
<td>Difficulty eating</td>
</tr>
<tr>
<td>C15</td>
<td>Stressed and depressed</td>
</tr>
<tr>
<td>C16</td>
<td>Easy pregnancy</td>
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<tr>
<td>C17</td>
<td>Other</td>
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<td>Sources of Advice</td>
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<td>D11</td>
<td>Physicians</td>
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<tr>
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<td>Resource Mothers</td>
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<td>D13</td>
<td>Family Members</td>
</tr>
<tr>
<td>D14</td>
<td>Friends</td>
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<tr>
<td>D15</td>
<td>Pastor</td>
</tr>
<tr>
<td>D16</td>
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<tr>
<td>D17</td>
<td>Other</td>
</tr>
<tr>
<td>E1</td>
<td>Personal Habits</td>
</tr>
<tr>
<td>E11</td>
<td>Continued tobacco use</td>
</tr>
<tr>
<td>E12</td>
<td>Discontinued tobacco use</td>
</tr>
<tr>
<td>E13</td>
<td>Continue alcohol use</td>
</tr>
<tr>
<td>E14</td>
<td>Discontinued alcohol use</td>
</tr>
<tr>
<td>E15</td>
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</tr>
<tr>
<td>E16</td>
<td>Discontinued street drug use</td>
</tr>
<tr>
<td>E17</td>
<td>Never used tobacco, alcohol, or drugs</td>
</tr>
<tr>
<td>E18</td>
<td>Other</td>
</tr>
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<td>F1</td>
<td>Volunteer Participation</td>
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<td>Banner at Southside</td>
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<td>F12</td>
<td>Asked to join by staff member</td>
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<td>F13</td>
<td>Interested employee</td>
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<td>F14</td>
<td>Friend volunteered services</td>
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<td>F15</td>
<td>Other</td>
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<td>G1</td>
<td>Residential Areas</td>
</tr>
<tr>
<td>G11</td>
<td>Lived in areas since birth</td>
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<td>G12</td>
<td>Moved to a different area</td>
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<td>G13</td>
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<td>Formal six to eight weeks training</td>
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<td>H12</td>
<td>Training classes and sessions</td>
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<td>H13</td>
<td>Other</td>
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<tr>
<td>I1</td>
<td>Suggested Programmatic Changes</td>
</tr>
<tr>
<td>I11</td>
<td>Program warrants no changes</td>
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<td>I12</td>
<td>Not enough RAP Sessions</td>
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<td>I13</td>
<td>Other</td>
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<tr>
<td>J1</td>
<td>WIC Classes and Services</td>
</tr>
<tr>
<td>J11</td>
<td>Breastfeeding classes</td>
</tr>
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<td>J12</td>
<td>Nutrition classes</td>
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<tr>
<td>J13</td>
<td>Parenting classes</td>
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<tr>
<td>J14</td>
<td>Prenatal care classes</td>
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<td>J15</td>
<td>WIC vouchers</td>
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<tr>
<td>J16</td>
<td>Other</td>
</tr>
<tr>
<td>K1</td>
<td>Exercise and Rest Habits</td>
</tr>
<tr>
<td>K11</td>
<td>Began to exercise</td>
</tr>
<tr>
<td>K12</td>
<td>Walks regularly</td>
</tr>
<tr>
<td>K13</td>
<td>Exercises regularly</td>
</tr>
<tr>
<td>K14</td>
<td>Advised to exercise</td>
</tr>
<tr>
<td>K15</td>
<td>Limit physical activity</td>
</tr>
<tr>
<td>K16</td>
<td>Get plenty of rest</td>
</tr>
<tr>
<td>K17</td>
<td>Get plenty of sleep</td>
</tr>
<tr>
<td>K18</td>
<td>Other</td>
</tr>
<tr>
<td>L1</td>
<td>Nutrition Information</td>
</tr>
<tr>
<td>L11</td>
<td>Eat healthy</td>
</tr>
<tr>
<td>L12</td>
<td>Drink plenty of liquids</td>
</tr>
<tr>
<td>L13</td>
<td>Start taking vitamins</td>
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<tr>
<td>L14</td>
<td>Weight Management</td>
</tr>
<tr>
<td>L15</td>
<td>Other</td>
</tr>
<tr>
<td>M1</td>
<td>Social Support</td>
</tr>
<tr>
<td>M11</td>
<td>Emotional support</td>
</tr>
<tr>
<td>M12</td>
<td>Instrumental support</td>
</tr>
<tr>
<td>M13</td>
<td>Informational support</td>
</tr>
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<td>M14</td>
<td>Appraisal support</td>
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<td>M15</td>
<td>Other</td>
</tr>
<tr>
<td>N1</td>
<td>Strengths of Program</td>
</tr>
<tr>
<td>N11</td>
<td>Serve as a role model</td>
</tr>
<tr>
<td>N12</td>
<td>Makes lots of friends</td>
</tr>
<tr>
<td>N13</td>
<td>Improved communication skills</td>
</tr>
<tr>
<td>N14</td>
<td>Helps young mothers</td>
</tr>
<tr>
<td>N15</td>
<td>Counseling and mentoring</td>
</tr>
<tr>
<td>N16</td>
<td>Purchased food and clothing</td>
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<tr>
<td>N17</td>
<td>Serve as an extended part of the family</td>
</tr>
<tr>
<td>N18</td>
<td>Provide 24 hour coverage</td>
</tr>
<tr>
<td>N19</td>
<td>Safe sex training</td>
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<tr>
<td>N20</td>
<td>Condom Program</td>
</tr>
<tr>
<td>N21</td>
<td>Use of birth control</td>
</tr>
<tr>
<td>N22</td>
<td>It’s a good program</td>
</tr>
<tr>
<td>N23</td>
<td>Other</td>
</tr>
<tr>
<td>O1</td>
<td>Behavioral Changes</td>
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<tr>
<td>O11</td>
<td>Made no changes</td>
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<tr>
<td>O12</td>
<td>Lifestyle changes</td>
</tr>
<tr>
<td>O13</td>
<td>Difficult time making changes</td>
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<tr>
<td>O14</td>
<td>No difficulty making changes</td>
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<td>O15</td>
<td>Changed health behavior</td>
</tr>
<tr>
<td>O16</td>
<td>Other</td>
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Table C.7: WIC Code List
Appendix D: Tables Listed In Chapter 4 – Quantitative Results
Table D.1: Percent of LBW Infants at Southside and Grady WIC Clinics, 1999 & 2000.

There are only 3 Hispanic Clients at Southside.

Table D.1: Percent of LBW Infants at Southside and Grady WIC Clinics
<table>
<thead>
<tr>
<th>WIC Client Characteristics</th>
<th>Southside Mothers (Exposed to Resource Mothers)</th>
<th>Grady Mothers (Unexposed to Resource Mothers)</th>
</tr>
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<tbody>
<tr>
<td>Variables</td>
<td>Total Responses</td>
<td>Missing Responses</td>
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<td>Race-Ethnicity</td>
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<td>0</td>
</tr>
<tr>
<td>Age</td>
<td>361</td>
<td>0</td>
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<tr>
<td>Education</td>
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<td>136</td>
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<td>Family Size</td>
<td>361</td>
<td>0</td>
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<tr>
<td>Family Income</td>
<td>361</td>
<td>0</td>
</tr>
<tr>
<td>Marital Status</td>
<td>361</td>
<td>0</td>
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<td>Nutritional Risk</td>
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<tr>
<td>Alcohol Use</td>
<td>361</td>
<td>0</td>
</tr>
<tr>
<td>Cigarette Use</td>
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<td>0</td>
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<td>Street Drug Use</td>
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<td>0</td>
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<td>Pre-gravid Weight</td>
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<td>0</td>
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Table D.2: Description of Missing Responses from WIC Data Set for Southside Medical Center and Grady Memorial Hospital. WIC Clinics, 1999-2000.
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<th>WIC Client Characteristics (Variable Name)</th>
<th>Total</th>
<th>No.</th>
<th>%</th>
<th>No.</th>
<th>%</th>
<th>Total</th>
<th>No.</th>
<th>%</th>
<th>No.</th>
<th>%</th>
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<td>37.67</td>
<td>225</td>
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<td>62.57</td>
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<td>32</td>
<td>33.33</td>
<td>64</td>
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<td>70.97</td>
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<td>47</td>
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<td>08</td>
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Table D.3: Clients with Missing Data for the Educational Status of Mothers who attended Southside’s WIC Clinic (exposed to Resource Mothers) and Grady Memorial Hospital’s WIC Clinics (unexposed to Resource Mothers) by selected risk factors.
### WIC Client Characteristics

#### Southside Mothers (Exposed to Resource Mothers)

<table>
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<th>Variable Name</th>
<th>Total</th>
<th>No.</th>
<th>%</th>
<th>Available Data</th>
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</thead>
<tbody>
<tr>
<td>Race-Ethnicity (race31r) Black, Non-Hispanic</td>
<td>358</td>
<td>134</td>
<td>37.43</td>
<td>224</td>
</tr>
<tr>
<td>Age, yrs (age 31r) &lt;20</td>
<td>57</td>
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<td>78.95</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>20-34</td>
<td>277</td>
<td>30.69</td>
<td>192</td>
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<td>24</td>
<td>04</td>
<td>16.67</td>
</tr>
<tr>
<td>Family Size (famsiz21r) 1-3 Persons</td>
<td>134</td>
<td>46</td>
<td>34.33</td>
<td>88</td>
</tr>
<tr>
<td></td>
<td>4 or More Persons</td>
<td>224</td>
<td>88</td>
<td>39.29</td>
</tr>
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<td>Family Income Per Month (finc21r) &lt;$1,500</td>
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<tr>
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<td>&gt;$1,500</td>
<td>30</td>
<td>06</td>
<td>20.00</td>
</tr>
<tr>
<td>Marital Status (marid21r) Married</td>
<td>328</td>
<td>130</td>
<td>39.63</td>
<td>198</td>
</tr>
<tr>
<td></td>
<td>Not Married</td>
<td>30</td>
<td>04</td>
<td>13.33</td>
</tr>
<tr>
<td>Nutritional Risk (hrisk21r) High</td>
<td>269</td>
<td>106</td>
<td>39.41</td>
<td>163</td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>89</td>
<td>28</td>
<td>31.46</td>
</tr>
<tr>
<td>Alcohol Use (alc21r) None</td>
<td>356</td>
<td>133</td>
<td>37.36</td>
<td>223</td>
</tr>
<tr>
<td></td>
<td>Any</td>
<td>02</td>
<td>01</td>
<td>50.00</td>
</tr>
<tr>
<td>Cigarette Use (cig21r) None</td>
<td>350</td>
<td>129</td>
<td>36.86</td>
<td>221</td>
</tr>
<tr>
<td></td>
<td>Any</td>
<td>08</td>
<td>05</td>
<td>62.50</td>
</tr>
<tr>
<td>Street Drug Use (idrug21r) None</td>
<td>343</td>
<td>131</td>
<td>38.19</td>
<td>212</td>
</tr>
<tr>
<td></td>
<td>Any</td>
<td>15</td>
<td>03</td>
<td>20.00</td>
</tr>
<tr>
<td>Pregravid Weight 0-127</td>
<td>189</td>
<td>73</td>
<td>38.62</td>
<td>116</td>
</tr>
<tr>
<td></td>
<td>137-161</td>
<td>72</td>
<td>22</td>
<td>30.56</td>
</tr>
<tr>
<td></td>
<td>162-450</td>
<td>97</td>
<td>39</td>
<td>40.21</td>
</tr>
</tbody>
</table>

#### Grady Mothers (Unexposed to Resource Mothers)

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Total</th>
<th>No.</th>
<th>%</th>
<th>Available Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race-Ethnicity (race31r) Black, Non-Hispanic</td>
<td>358</td>
<td>134</td>
<td>37.43</td>
<td>224</td>
</tr>
<tr>
<td>Age, yrs (age 31r) &lt;20</td>
<td>57</td>
<td>45</td>
<td>78.95</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>20-34</td>
<td>277</td>
<td>30.69</td>
<td>192</td>
</tr>
<tr>
<td></td>
<td>35 or more</td>
<td>24</td>
<td>04</td>
<td>16.67</td>
</tr>
<tr>
<td>Family Size (famsiz21r) 1-3 Persons</td>
<td>134</td>
<td>46</td>
<td>34.33</td>
<td>88</td>
</tr>
<tr>
<td></td>
<td>4 or More Persons</td>
<td>224</td>
<td>88</td>
<td>39.29</td>
</tr>
<tr>
<td>Family Income Per Month (finc21r) &lt;$1,500</td>
<td>30</td>
<td>06</td>
<td>20.00</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>&gt;$1,500</td>
<td>328</td>
<td>128</td>
<td>39.02</td>
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<tr>
<td>Marital Status (marid21r) Married</td>
<td>30</td>
<td>04</td>
<td>13.33</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>Not Married</td>
<td>328</td>
<td>130</td>
<td>39.63</td>
</tr>
<tr>
<td>Nutritional Risk (hrisk21r) High</td>
<td>269</td>
<td>106</td>
<td>39.41</td>
<td>163</td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>89</td>
<td>28</td>
<td>31.46</td>
</tr>
<tr>
<td>Alcohol Use (alc21r) None</td>
<td>356</td>
<td>133</td>
<td>37.36</td>
<td>223</td>
</tr>
<tr>
<td></td>
<td>Any</td>
<td>02</td>
<td>01</td>
<td>50.00</td>
</tr>
<tr>
<td>Cigarette Use (cig21r) None</td>
<td>350</td>
<td>129</td>
<td>36.86</td>
<td>221</td>
</tr>
<tr>
<td></td>
<td>Any</td>
<td>08</td>
<td>05</td>
<td>62.50</td>
</tr>
<tr>
<td>Street Drug Use (idrug21r) None</td>
<td>343</td>
<td>131</td>
<td>38.19</td>
<td>212</td>
</tr>
<tr>
<td></td>
<td>Any</td>
<td>15</td>
<td>03</td>
<td>20.00</td>
</tr>
<tr>
<td>Pregravid Weight 0-127</td>
<td>189</td>
<td>73</td>
<td>38.62</td>
<td>116</td>
</tr>
<tr>
<td></td>
<td>137-161</td>
<td>72</td>
<td>22</td>
<td>30.56</td>
</tr>
<tr>
<td></td>
<td>162-450</td>
<td>97</td>
<td>39</td>
<td>40.21</td>
</tr>
</tbody>
</table>

### Table D.4: Clients with Missing Data for the Educational Status of Black mothers who attended Southside’s WIC Clinic (exposed to Resource Mothers) and Grady Memorial Hospital’s WIC Clinics (unexposed to Resource Mothers) by selected risk factors.
<table>
<thead>
<tr>
<th>WIC Client Characteristics (Variable Name)</th>
<th>Southside Mothers (n=361)</th>
<th>Southside Mothers Exposed to Resource Mothers</th>
<th>Southside &amp; Grady</th>
<th>Grady Mothers (n=152)</th>
<th>All Other Mothers Statewide (N=49,558)</th>
<th>Southside &amp; Grady Statewide</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. %</td>
<td>No. %</td>
<td>% Chi-square (Chi Square Value)</td>
<td>% % Chi Square (Chi Square Value)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birth Weight</td>
<td>56 15.52 31 20.39 1.48 (0.2237)</td>
<td>305 84.49 121 79.61 1.48 (0.2237)</td>
<td>7528 15.19 42030 84.81 0.01 (0.9232)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race-Ethnicity (race31r)</td>
<td>358 99.2 96 63.2 1.48 (0.2237)</td>
<td>03 0.8 55 36.2 1.48 (0.2237)</td>
<td>21116 15.19 6466 84.81 4.47 (0.0001)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age, yrs (age 31r)</td>
<td>57 15.8 31 20.4 1.48 (0.2237)</td>
<td>280 77.6 111 73.0 1.48 (0.2237)</td>
<td>9909 15.19 36378 84.81 0.01 (0.9232)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education (educ21r)</td>
<td>164 72.9 53 65.4 1.48 (0.2237)</td>
<td>61 27.1 28 34.6 1.48 (0.2237)</td>
<td>20028 15.19 9057 84.81 4.47 (0.0001)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family Size (famsiz21r)</td>
<td>134 37.1 57 37.5 0.01 (0.9351)</td>
<td>227 62.9 95 62.5 0.01 (0.9351)</td>
<td>24528 15.19 24707 84.81 50.18 (0.0001)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family Income Per Month (finc21r)</td>
<td>331 91.7 136 89.5 0.01 (0.9351)</td>
<td>30 8.3 16 10.5 0.01 (0.9351)</td>
<td>37350 15.19 12056 84.81 50.18 (0.0001)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Marital Status (marid21r)</td>
<td>31 8.6 41 27.2 0.01 (0.9351)</td>
<td>330 91.4 110 72.9 0.01 (0.9351)</td>
<td>18233 15.19 31033 84.81 50.18 (0.0001)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Nutritional Risk (hrisk21r)</td>
<td>270 74.8 111 74.0 0.01 (0.9351)</td>
<td>91 25.2 39 26.0 0.01 (0.9351)</td>
<td>28415 15.19 19425 84.81 50.18 (0.0001)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol Use (alc21r)</td>
<td>359 99.5 144 100.0 0.01 (0.9351)</td>
<td>02 0.6 0 0.0 0.01 (0.9351)</td>
<td>48600 15.19 214 84.81 50.18 (0.0001)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Cigarette Use (cig21r)</td>
<td>353 97.8 141 97.9 0.01 (0.9351)</td>
<td>08 2.2 3 2.1 0.01 (0.9351)</td>
<td>43580 15.19 5172 84.81 50.18 (0.0001)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Street Drug Use (idrug21r)</td>
<td>345 95.6 146 96.1 0.01 (0.9351)</td>
<td>16 4.4 6 3.9 0.01 (0.9351)</td>
<td>47443 15.19 1963 84.81 50.18 (0.0001)</td>
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</tr>
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</table>

Table D.5: Characteristics of mothers who attended Southside’s WIC Clinic (exposed to Resource Mothers) and Grady Memorial Hospital’s WIC Clinics (unexposed to Resource Mothers) by selected risk factors.
<table>
<thead>
<tr>
<th>(Variable Name)</th>
<th>Southside Mothers (n=358)</th>
<th>Grady Mothers (n=96)</th>
<th>Mothers (Statewide) n= 21,212</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth Weight</td>
<td>Low</td>
<td>55/303</td>
<td>26/70</td>
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<tr>
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<td>Normal</td>
<td>15.4/84.6</td>
<td>27.1/72.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.09 (0.0077)</td>
<td>19.15/80.85</td>
</tr>
<tr>
<td>Age, yrs (age</td>
<td>&lt;20</td>
<td>57/280</td>
<td>21/65</td>
</tr>
<tr>
<td>31r)</td>
<td>20-34</td>
<td>24/6.7</td>
<td>10/10.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.89 (0.1427)</td>
<td>20.37/72.50</td>
</tr>
<tr>
<td>Education</td>
<td>High School or Less</td>
<td>164/60</td>
<td>38/26</td>
</tr>
<tr>
<td></td>
<td>Some College or More</td>
<td>134/37.4</td>
<td>36/37.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.55 (0.0329)</td>
<td>11717/55.40</td>
</tr>
<tr>
<td>Family Size</td>
<td>1-3 Persons</td>
<td>134/37.4</td>
<td>36/37.5</td>
</tr>
<tr>
<td></td>
<td>4 or More Persons</td>
<td>224/62.6</td>
<td>60/62.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.00 (0.9900)</td>
<td>11717/55.40</td>
</tr>
<tr>
<td>Family Income</td>
<td>$&lt;1,500</td>
<td>328/91.6</td>
<td>97/90.6</td>
</tr>
<tr>
<td>Per Month</td>
<td>$1,500</td>
<td>30/8.4</td>
<td>9/9.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.10 (0.7573)</td>
<td>18419/86.83</td>
</tr>
<tr>
<td>Marital Status</td>
<td>Married</td>
<td>30/8.4</td>
<td>12/12.3</td>
</tr>
<tr>
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<td>Not Married</td>
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<td>83/87.4</td>
</tr>
<tr>
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<td></td>
<td>1.61 (0.2040)</td>
<td>3787/17.89</td>
</tr>
<tr>
<td>Nutritional Risk</td>
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<td>269/75.1</td>
<td>75/78.9</td>
</tr>
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<td>Normal</td>
<td>89/24.9</td>
<td>20/21.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.60 (0.4402)</td>
<td>13377/65.50</td>
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<tr>
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<td>93/100</td>
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<td>Any</td>
<td>2/0.6</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.52 (0.4700)</td>
<td>20805/99.36</td>
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<tr>
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<td>350/97.8</td>
<td>90/96.8</td>
</tr>
<tr>
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<td>Any</td>
<td>8/2.2</td>
<td>03/3.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.30 (0.5809)</td>
<td>20119/96.33</td>
</tr>
<tr>
<td>Street Drug Use</td>
<td>None</td>
<td>343/95.8</td>
<td>94/97.9</td>
</tr>
<tr>
<td></td>
<td>Any</td>
<td>15/4.2</td>
<td>02/2.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.93 (0.3343)</td>
<td>20307/95.73</td>
</tr>
</tbody>
</table>

Table D.6: Characteristics of Black mothers who attended Southside’s WIC Clinic (exposed to Resource Mothers) and Grady Memorial Hospital’s WIC Clinics (unexposed to Resource Mothers) by selected risk factors.
<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Southside Mothers (n=361)</th>
<th>Grady Mothers (n=152)</th>
<th>All Other Mothers (Statewide n=49,558)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant birth weight (lbs Infantwgt)</td>
<td>6.56 (1.26)</td>
<td>6.47 (1.51)</td>
<td>6.73 (1.32)</td>
</tr>
<tr>
<td>Age yrs (ageyrs)</td>
<td>24.6 (5.58)</td>
<td>24.28 (5.69)</td>
<td>24.33 (5.60)</td>
</tr>
<tr>
<td>Education yrs (education)</td>
<td>11.60 (1.60)</td>
<td>10.38 (3.19)</td>
<td>10.38 (3.19)</td>
</tr>
<tr>
<td>Family Size (famsize)</td>
<td>4.14 (1.40)</td>
<td>4.22– (1.67)</td>
<td>4.235 (1.42)</td>
</tr>
<tr>
<td>Family Income per month</td>
<td>$543.73 ($532.62)</td>
<td>$754.77 ($571.10)</td>
<td>$969.22 ($877.23)</td>
</tr>
<tr>
<td>Alcohol use, per Week (alcohol)</td>
<td>0.12 (1.80)</td>
<td>0.0 (0.00)</td>
<td>0.06 (1.51)</td>
</tr>
<tr>
<td>Cigarette use, number per day (Cigarettes)</td>
<td>0.17 (1.60)</td>
<td>0.10 (0.80)</td>
<td>1.13 (3.99)</td>
</tr>
<tr>
<td>Street Drug Use, per Week</td>
<td>1.04 (0.21)</td>
<td>0.04 (0.20)</td>
<td>0.04 (0.20)</td>
</tr>
<tr>
<td>Pre-gravid weight lbs (pre gravidwg)</td>
<td>100.19 (83.78)</td>
<td>143.82 (33.05)</td>
<td>154.39 (43.28)</td>
</tr>
</tbody>
</table>

Table D.7: Characteristics of mothers who attended Southside (exposed to Resource Mothers), Grady Memorial Hospital (unexposed to Resource Mothers), and all WIC clinics in Georgia, 1999 and 2000, using continuous variables.
### WIC Client Characteristics

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Southside Mothers (n=361) (Exposed to Resource Mothers)</th>
<th>Grady Mothers (n=152) (Unexposed to Resource Mothers)</th>
<th>All Other Mothers (Statewide) (n=49,558) (Unexposed to Resource Mothers)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean</strong> (S.D.)</td>
<td>N 358 (1.22) 1.07 – 10.00</td>
<td>N 96 Mean (S.D.) 6.25 (1.48) Range 3.04 – 11.09 TTest/P Value 2.24 (0.0253)</td>
<td>N 20915 Mean (S.D.) 6.38 (1.30) Range 0.06 – 15.03 TTest/P Value 4.45 (0.0001)</td>
</tr>
<tr>
<td>Infant birth weight (lbs Infants)</td>
<td>N 358 6.58 (1.22)</td>
<td>N 96 24.48 (6.22) Range 14 – 40 TTest/P Value 0.10 (0.9235)</td>
<td>N 20989 Mean (S.D.) 23.85 (5.37) Range 21.31 – 5.02 TTest/P Value 0.0210</td>
</tr>
<tr>
<td>Age yrs (ageyrs)</td>
<td>N 358 24.51 (5.59) Range 13 – 45</td>
<td>N 96 7 – 16 TTest/P Value 0.97 (0.3340)</td>
<td>N 20989 Mean (S.D.) 12.21 (9.41) Range 4.72 – 0.4695 TTest/P Value 0.0210</td>
</tr>
<tr>
<td>Education yrs (education)</td>
<td>N 224 11.85 (4.89) Range 7 – 18</td>
<td>N 358 2.24 (0.0253) Range 0.06 – 15.03 TTest/P Value 0.0001</td>
<td>N 20915 Mean (S.D.) 13.57 (5.68) Range 7.67 – 0.0001 TTest/P Value 0.0101</td>
</tr>
<tr>
<td>Family Size (famsiz)</td>
<td>N 358 4.13 (1.41) Range 1 – 10</td>
<td>N 96 2.24 (1.81) Range 02 – 13 TTest/P Value 0.76 (0.4453)</td>
<td>N 20915 Mean (S.D.) 13.57 (5.68) Range 7.67 – 0.0001 TTest/P Value 0.0101</td>
</tr>
<tr>
<td>Family Income per month</td>
<td>N 358 $543.73 (832.62) Range $0 - $2,418</td>
<td>N 96 $754.77 (571.10) Range $0 - $2,362 TTest/P Value 3.39 (0.0007)</td>
<td>N 20915 Mean (S.D.) 1132.85 (895.39) Range $0 - $3,057 TTest/P Value 11.28 (0.0001)</td>
</tr>
<tr>
<td>Alcohol use, per Week (alcohol)</td>
<td>N 358 0.12 (1.80) Range 0 – 32</td>
<td>N 96 0 (0.06) Range 0 – 8 TTest/P Value 0.00 (0.9542)</td>
<td>N 20915 Mean (S.D.) 0.06 (1.55) Range 0.00 – 8.20 TTest/P Value 0.04221</td>
</tr>
<tr>
<td>Cigarette use, number per day (Cigarettes)</td>
<td>N 358 0.17 (1.60) Range 0 – 20</td>
<td>N 96 0.16 (0.99) Range 0 – 8 TTest/P Value 0.06 (0.9542)</td>
<td>N 20973 Mean (S.D.) 2.38 (5.68) Range 0 – 8 TTest/P Value 7.37 (0.0001)</td>
</tr>
<tr>
<td>Street Drug Use, per Week</td>
<td>N 358 1.04 (0.20) Range 0 – 2</td>
<td>N 96 0.20 (0.14) Range 0 – 3 TTest/P Value 0.96 (0.3354)</td>
<td>N 20989 Mean (S.D.) 0.03 (1.86) Range 0 – 2 TTest/P Value 0.88 (0.3787)</td>
</tr>
<tr>
<td>Pre-gravid weight lbs</td>
<td>N 358 100.25 (83.89) Range 9.4 – 366</td>
<td>N 96 151.02 (35.27) Range 100 – 275 TTest/P Value 5.70 (0.0001)</td>
<td>N 20989 Mean (S.D.) 145.67 (53.79) Range 65 – 45 TTest/P Value 15.65 (0.0001)</td>
</tr>
</tbody>
</table>

Table D.8: Characteristics of Black mothers who attended Southside (exposed to Resource Mothers), Grady Memorial Hospital (unexposed to Resource Mothers), and all WIC Clinics in Georgia, 1999 and 2000, using continuous variables.
Table D.9: Percentage of infants with low (or very low) birth weight among mothers who attended Southside’s WIC Clinic (exposed to resource mothers) and mothers who attended Grady Memorial’s WIC Clinic (unexposed to resource mothers) stratified by selected risk factors.
Table D.10: Percentage of infants with low (or very low) birth weight among Black mothers who attended Southside’s WIC Clinic (exposed to resource mothers) and Black mothers who attended Grady Memorial’s WIC Clinic (unexposed to resource mothers) stratified by selected risk factors.
### WIC Client Characteristics

<table>
<thead>
<tr>
<th>Variables</th>
<th>Southside Mothers (n=361) Unexposed to Resource Mothers</th>
<th>Grady Mothers (n=152) (Exposed to Resource Mothers)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
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<td>Education (educ21r)</td>
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<td>1-3 Persons</td>
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<td>Cigarette Use (cig21r)</td>
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<td>Street Drug Use (idrug21r)</td>
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Footnotes:  
*Difference of means between categories of client characteristics among exposed to Resource Mothers.  
**Difference of means between categories of client characteristics among mothers not exposed to Resource Mothers.

**Table D.11: Unadjusted mean infant birth weight among mothers who attended Southside’s WIC Clinic (exposed to Resource Mothers) and mothers who attended Grady Memorial’s WIC Clinic (unexposed to Resource Mothers) stratified by selected risk factors.**
### Table D.12: Unadjusted Mean Infant Birth Weight Among Black Mothers Who Attended Southside’s WIC Clinic (Exposed to Resource Mothers) and Black Mothers Who Attended Grady Memorial’s WIC Clinic (Unexposed to Resource Mothers) Stratified by Selected Risk Factors

<table>
<thead>
<tr>
<th>Variables</th>
<th>Southside Mothers (n=358) (Exposed to Resource Mothers)</th>
<th>Grady Mothers (n=96) (Unexposed to Resource Mothers)</th>
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<tbody>
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<td></td>
<td>N</td>
<td>Mean</td>
</tr>
<tr>
<td>Age, yrs (age 31r)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20</td>
<td>57</td>
<td>6.31</td>
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<td>20-34</td>
<td>277</td>
<td>6.63</td>
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<td>35 or more</td>
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<td>6.56</td>
</tr>
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<td>Education (educ21r)</td>
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<td>High School Graduate or Less</td>
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<td>College or More</td>
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<td>6.65</td>
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<td>Family Size (famsiz21r)</td>
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<td></td>
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<tr>
<td>1-3 Persons **</td>
<td>134</td>
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</tr>
<tr>
<td>4 or More Persons</td>
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<td>6.56</td>
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<tr>
<td>Family Income Per Month (finc21r)</td>
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<td></td>
</tr>
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<td>&lt;$1,500</td>
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<td>6.60</td>
</tr>
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<td>&gt;$1,500</td>
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<td>6.57</td>
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<tr>
<td>Marital Status (marid21r)</td>
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</tr>
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<td>6.59</td>
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<td>Any</td>
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Footnotes:  
*Difference of means between categories of client characteristics among exposed to Resource Mothers.  
**Difference of means between categories of client characteristics among mothers not exposed to Resource Mothers.
<table>
<thead>
<tr>
<th>Respondent Characteristics (Variable Name)</th>
<th>Southside &amp; Grady Model 1 (a)</th>
<th>Southside &amp; Grady Model 2 (b)</th>
<th>Southside &amp; Grady Model 3©</th>
<th>Southside &amp; Grady Model 4 (d)</th>
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<td></td>
<td>Unadjusted Odds Ratio (95% CI) n=513</td>
<td>Adjusted Odds Ratio (95% CI) N=301</td>
<td>Adjusted Odds Ratio (95% CI) N=501</td>
<td>Adjusted Odds Ratio (95% CI) N=501</td>
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<td>Exposed to Resource Mothers</td>
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<tr>
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<td>0.34 (0.16, 0.73) Reference</td>
<td>0.53 (0.30, 0.94) Reference</td>
<td>0.51 (0.30, 0.90) Reference</td>
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<tr>
<td>No (Grady)</td>
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<td></td>
<td></td>
<td>0.54 (0.32, 0.93) Reference</td>
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<td>Race-Ethnicity (race31r)</td>
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<tr>
<td>Black, non-Hispanic</td>
<td>0.53 (0.22, 1.28) Reference</td>
<td>0.62 (0.16, 2.41) Reference</td>
<td>2.08 (0.74, 5.82) Reference</td>
<td>2.71 (1.03, 7.13) Reference</td>
</tr>
<tr>
<td>Hispanic</td>
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<td></td>
<td></td>
<td>2.72 (1.04, 7.13) Reference</td>
</tr>
<tr>
<td>All Others</td>
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<tr>
<td>Age, yrs (age 31r)</td>
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<td></td>
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</tr>
<tr>
<td>&lt;20 c</td>
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<td>0.65 (0.17, 2.56) Reference</td>
<td>1.49 (0.81, 2.75) Reference</td>
<td>1.39 (0.77, 2.52) Reference</td>
</tr>
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<td>20-34</td>
<td>2.35 (1.07, 5.16) Reference</td>
<td>3.43 (1.33, 8.84) Reference</td>
<td>1.81 (0.78, 4.24) Reference</td>
<td>2.14 (0.96, 4.78) Reference</td>
</tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>Education (edu21r)</td>
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<tr>
<td>High school graduate or less</td>
<td>1.84 (0.88, 3.86) Reference</td>
<td>2.34 (0.99, 5.49) Reference</td>
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</tr>
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<td>Some college or more</td>
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<td></td>
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<td>Family Size (famsiz21r)</td>
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<tr>
<td>1 – 3 persons c</td>
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<td>2.01 (1.03, 3.90) Reference</td>
<td>1.63 (0.10, 2.66) Reference</td>
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<tr>
<td>4 or more persons</td>
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<td></td>
<td></td>
<td>1.50 (.93, 2.41) Reference</td>
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<tr>
<td>Family Income per month (fine21r)</td>
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<td>Reference</td>
<td>Reference</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Unmarried</td>
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<td>1.28 (0.72, 2.28) Reference</td>
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<tr>
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<td></td>
</tr>
<tr>
<td>Cigarette use (cig21re)</td>
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<td></td>
</tr>
<tr>
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<td>Reference</td>
<td>Reference</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
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<td>1.54 (0.14, 16.98) Reference</td>
<td>2.12 (0.37, 7.88) Reference</td>
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</tr>
<tr>
<td>Street Drug use (idrug21r)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>Reference</td>
<td>Reference</td>
<td>Reference</td>
<td></td>
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<tr>
<td>Any</td>
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<td>3.65 (1.34, 9.96) Reference</td>
<td>3.13 (1.19, 8.21) Reference</td>
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</table>

Footnotes:  
a: Variables: resource mother, race, age, education, family size, family income, marital status, high risk status, cigarette use, drug use; (Hosmer Lemseshow goodness of fit - p=0.1134)  
b: Variables: resource mother, race, age, family size, family income, marital status, high risk status, cigarette use, drug use  
c: Backward elimination variables: resource mother, race, age, family size, family income, marital status, high risk status, cigarette use, illegal drug use (Hosmer Lemseshow goodness of fit – p = 0.6667).  
d: Controlling only for race, age and family size (Hosmer and Lemoseshow goodness of fit - p=0.2820).  

Table D.13: Risk of low (or very low) birth weight associated with exposure to Resource Mothers (attended Southside’s WIC Clinic).
Table D.14: Risk of low (or very low) birth weight infants born to Black Mothers associated with exposure to Resource Mothers (attended Southside’s WIC Clinic) after controlling for potential confounders.

<table>
<thead>
<tr>
<th>Respondent Characteristics (Variable Name)</th>
<th>Southside and Grady Model 1 (a)</th>
<th>Southside &amp; Grady Model 2 (b)</th>
<th>Southside &amp; Grady Model 3 (c)</th>
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<tbody>
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<td>Adjusted Odds Ratio (95% CI) n=449</td>
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<td>0.97 (0.25, 3.79) Reference</td>
<td>1.71 (0.91, 3.20) Reference</td>
<td>1.59 (0.86, 2.94) Reference</td>
</tr>
<tr>
<td>Education (educ212) High school graduate or less Some college or more</td>
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<td>2.83 (1.14, 7.00) Reference</td>
<td>1.64 (0.98, 2.75 Reference</td>
<td>1.48 (0.90, 2.43) Reference</td>
</tr>
<tr>
<td>Family Size (famsiz21r) 1 – 3 persons c 4 or more persons</td>
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<td>2.14 (1.06, 4.31) Reference</td>
<td>1.64 (0.98, 2.75 Reference</td>
<td>1.48 (0.90, 2.43) Reference</td>
</tr>
<tr>
<td>Family Income per month (fine21r) &lt;$1,500 &gt;$1,500</td>
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<td>Reference 1.94 (0.61, 6.20)</td>
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</tr>
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<td>Reference 1.46 (0.45, 4.70)</td>
<td>Reference 1.55 (0.58, 4.14)</td>
<td>Reference 1.48 (0.90, 2.43)</td>
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<tr>
<td>Nutritional risk (hrisk21r) High Normal</td>
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<td>1.13 (0.52, 2.48) Reference</td>
<td>1.29 (0.70, 2.38) Reference</td>
<td>Reference 1.48 (0.90, 2.43)</td>
</tr>
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<td>Cigarette use (cig21re) None Any</td>
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<td>1.79 (0.16, 19.99) Reference</td>
<td>2.12 (0.56, 7.94) Reference</td>
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<td>Street Drug use (idrug21r) None Any</td>
<td>3.43 (1.27, 9.31) Reference</td>
<td>3.02 (0.79, 11.54) Reference</td>
<td>4.50 (1.59, 12.78) Reference</td>
<td>3.83 (1.40, 10.52) Reference</td>
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</tbody>
</table>

Footnote:  
- Variables: resource mother, age, education, family size, family income, marital status, high risk status, cigarette use, drug use, (Hosmer Lemeshow goodness of fit, - p=0.1446).  
- Variables: resource mother, age, education, family size, family income, marital status, high risk status, cigarette use, drug use, (Hosmer Lemeshow goodness of fit, - p=0.2330).  
- Backward elimination variables: resource mother, age, family size, family income, marital status, high risk status, cigarette use, drug use. (Hosmer Lemeshow goodness of fit, - p=0.2212).  
- Controlling only for age and family size (Hosmer Lemeshow goodness of fit, - p=0.2581).
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Nolte, E., Koupilova, L. and McKee, M. (2002). The Increase in Very-Low-Birthweight Infants in Germany: Artifact or Reality? *Paediart Perinat Epidemiol*, 16(2) 131-140.


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