

PREGNANCY NUTRITION SURVEILLANCE



GEORGIA 2002



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The Centers for Disease Control and Prevention's (CDC) Pregnancy Nutrition Surveillance System (PNSS) was established in 1979 to help monitor the health and nutritional status of low-income pregnant women, at risk of adverse pregnancy outcome, enrolled in public health programs across the United States. In 2002, 23 states and 5 tribal governments participated in the PNSS. The PNSS collects both prenatal and postpartum information. The information collected includes socio-demographic factors, nutritional risk factors (including prepregnancy weight, maternal weight gain and hematological status) prenatal risk factors, infant feeding practices and birth outcome. Public health programs that contribute to the PNSS include the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) as well as prenatal programs funded by the Maternal and Child Health Services Block Grant. In PNSS 2002, 98.9% of data were obtained from WIC programs across the United States.

The PNSS was established to help health professionals identify and reduce pregnancy-related health risks that contribute to adverse pregnancy outcomes among women enrolled in federally funded public health prenatal and nutritional programs. At its inception, information collected included nutrition-related problems, smoking behavior and birth outcome. However, in 1989 the system was enhanced to include information on maternal race or ethnicity, maternal birth date, marital status and educational level. Additionally, information on prepregnancy weight, total weight gain during pregnancy, parity, estimated timing of initiation of prenatal care, smoking and alcohol consumption three months before, during and after pregnancy was also included in the system. For infants, the system was updated to include information on number of multiple births, infants' date of birth, birthweight, sex, and status of birth. During the postpartum period, information is collected on breastfeeding status and age at introduction of formula feeding.

In Georgia, the WIC program submitted all of the PNSS 2002 data. The Georgia WIC Program was established in 1974 to help ameliorate the nutritional needs of low-income pregnant women, infants and children. Currently Georgia's WIC system includes 21 local agencies, 253 local clinics and 1,673 retail grocers that sell WIC-approved items. WIC services are available in all 159 of Georgia's counties.

The Georgia WIC Program transmits data to the PNSS quarterly. If there are duplicate records for a given participant, PNSS only accepts one record and updates that record. The CDC sends annual data summaries to the state's PNSS Coordinator to assist in program planning and monitoring. This report contains findings from the PNSS 2002 annual data summary.

DEMOGRAPHIC CHARACTERISTICS

Race/ethnicity

In 2002, records for 62,183 prenatal and postpartum women were extracted from the Pediatric Nutrition Surveillance System (PNSS). Among these, 36.4% were from White, non-Hispanic women, 43.7% were from Black, non-Hispanic women and 17.7% were from Hispanic women. A smaller proportion were from women of Asian/Pacific Islander (1.7%) or American Indian/Alaskan Native (0.1%) descent (Figure 1). In 2002, among the general population that gave birth in the state of Georgia, 50.0% were White, non-Hispanic, 31.3% were Black, non-Hispanic, 12.4% were Hispanic, 0.1% were American Indian/Alaskan Native and 0.2% were Asian/Pacific Islander (Figure 1).

Age

In 2002, the PNSS population was younger on average than the general Georgia population of women with live births. The majority of participants in the PNSS 2002 population were between 20-29 years old (60%) and an additional 22% were less than 20 years old. In the general Georgia population of women with live births, the largest proportion of women who gave birth during 2002 were those between 20-29 and 30-39 years old (Figure 2). Those less than 15 years old and those 40 years or older comprised a small proportion of women who gave birth in both the PNSS (1.5%) and the general Georgia population of women with live births (2.1%) during 2002 (Figure 2).

Education

The PNSS 2002 population had less education on average than the general Georgia population of women with live births. Among PNSS participants, the largest proportion had less than a high

Figure 1: Race and Ethnic Distribution Among Georgia PNSS Participants and the State of Georgia Women with Live Births, 2002

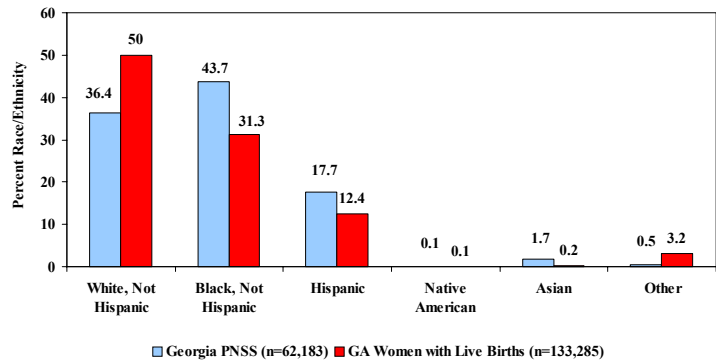
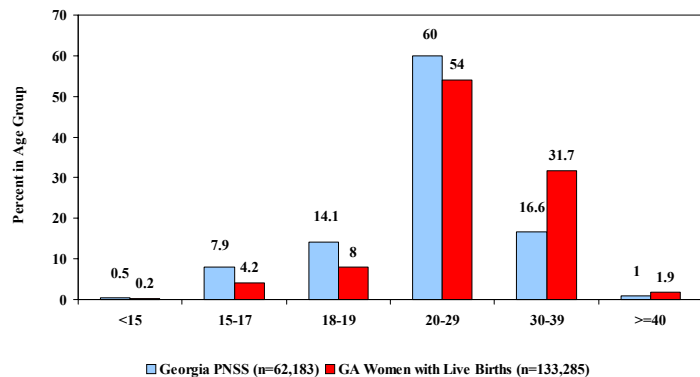


Figure 2: Age Distribution Among Georgia PNSS Participants and the State of Georgia Women with Live Births, 2002



school education (41.8%). A similar proportion had a high school degree (40.6%). Those with more than a high school education accounted for 19.6% of the population (Figure 3). In the general Georgia population of women with live births, the majority of women who delivered an infant in 2002 had either completed high school (47.0%) or had greater than a high school education (46.5%) (Figure 3). A small proportion of women in the general Georgia population of women with live births reported having less than a high school education (8.2%) (Figure 3).

Poverty Level/Migrant Status

Thirty-nine percent of PNSS 2002 participants reported income falling between 0-50% of the poverty level, while 0.45% reported income >200% of the poverty level (Figure 4). A small proportion of PNSS participants reported that they were migrants (0.3%) (Figure 5).

Figure 3: Education Level Distribution Among Georgia PNSS Participants and the State of Georgia Women with Live Births, 2002

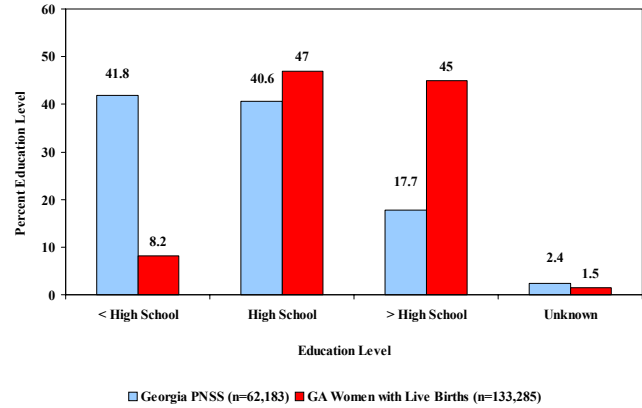


Figure 4: Percent Poverty Level Distribution Among Georgia PNSS Participants, 2002 (n= 62,183)

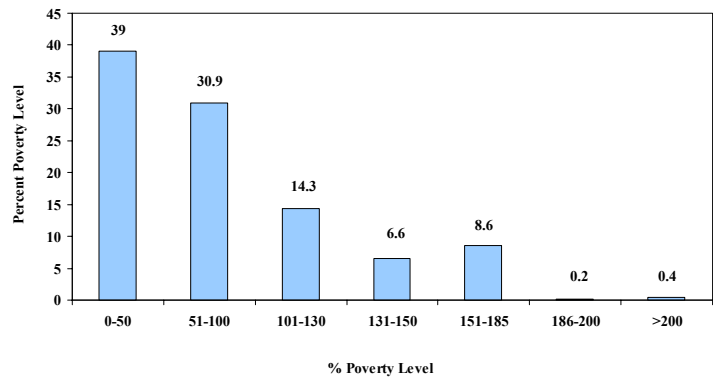
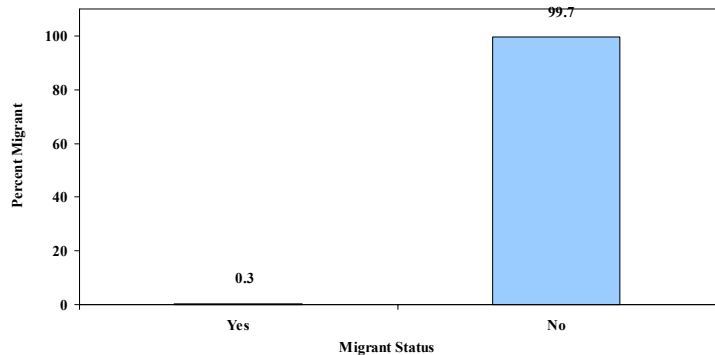


Figure 5: Prevalence of Migrant Status Among Georgia PNSS Participants, 2002 (n= 62,183)



MATERNAL HEALTH INDICATORS

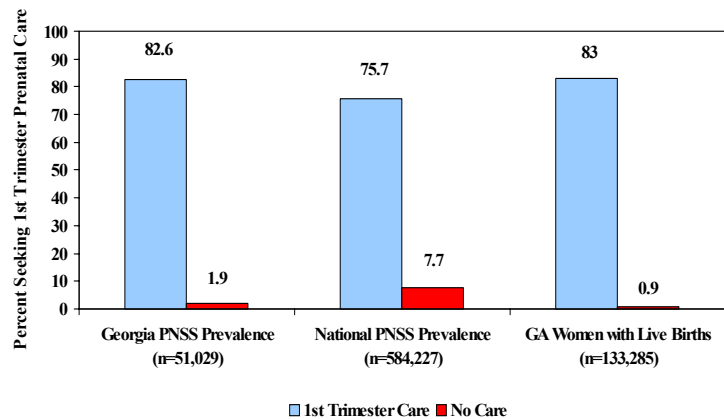
Medical Care

Early access to prenatal care is an important determinant of a successful pregnancy and subsequent delivery. The majority of participants in the Georgia and National PNSS samples and in the general population of women with live births reported obtaining prenatal care during the first trimester of pregnancy with the prevalence being slightly higher among the Georgia general population of women with live births compared to the state and national PNSS population. Georgia PNSS participants were 2.1 times more likely to report no prenatal care compared to the Georgia general population of women with live births; however, they were 76% less likely to report no prenatal care than the national PNSS population (Figure 6).

Prepregnancy Weight

A woman's prepregnancy weight and pattern of weight gain or loss during pregnancy are important clinical parameters that predict the birthweight of the child. Several factors may be associated with a woman's prepregnancy weight, including genetics, previous nutritional history and the environment.¹ Being either overweight or underweight during the prepregnancy period may have a significant impact on the weight of the fetus that may subsequently affect birth outcome.² Prepregnancy underweight is associated with delivery of a low birthweight infant² while prepregnancy overweight or obesity is associated with delivery of a high birthweight infant as well as an increased risk of delivering via C-section.² We defined a woman's prepregnancy weight-for-height (Body Mass Index-BMI) according to standards set by the Institute of Medicine 1990 report

Figure 6: Prevalence of Obtaining Prenatal Care During the 1st Trimester of Pregnancy Among Georgia and National PNSS Participants and the State of Georgia Women with Live Births, 2002



“Nutrition During Pregnancy.”

Underweight was defined as BMI <19.8, normal weight was BMI 19.9-26.0, overweight was BMI >26.0-29.0 and obese was BMI >29.0.² According to the Georgia and the national PNSS prevalence estimates, 44.7% and 41.4% respectively of participants reported being overweight or obese during the prepregnancy period (Figure 7).

Asian/Pacific Islander women were more likely to be underweight (28.8%) during the prepregnancy period compared to women of other race/ethnic groups (Figure 8). Black, non-Hispanic women (50.7%) were more likely to be overweight during the prepregnancy period compared to women of other race/ethnic groups (Figure 8).

In PNSS 2002, there appears to be a linear association between prepregnancy weight and age. Younger women were more likely to be underweight before pregnancy compared to older women (Figure 9). Likewise, women who were overweight before pregnancy tended to be older than 30 years (Figure 9). The risk factors for prepregnancy overweight included Black, non-Hispanic race and/or age 40 years or older, while underweight women tended to be younger than 15 years and/or Asian/Pacific Islander race (Figures 8 & 9).

Figure 7: Distribution of Georgia and National PNSS Participants by Prepregnancy BMI, 2002

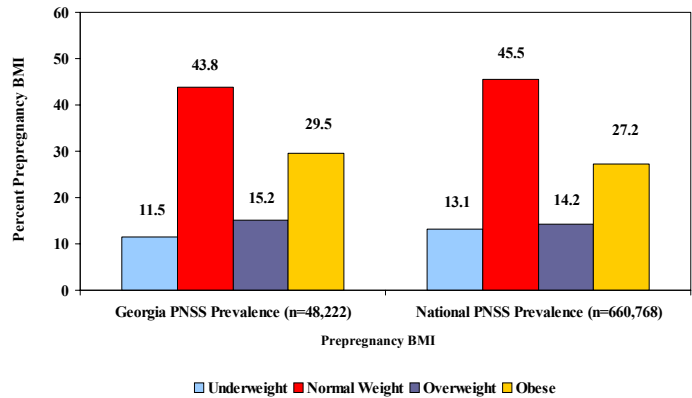


Figure 8: Racial and Ethnic Distribution of Georgia PNSS Participants by Prepregnancy BMI, 2002

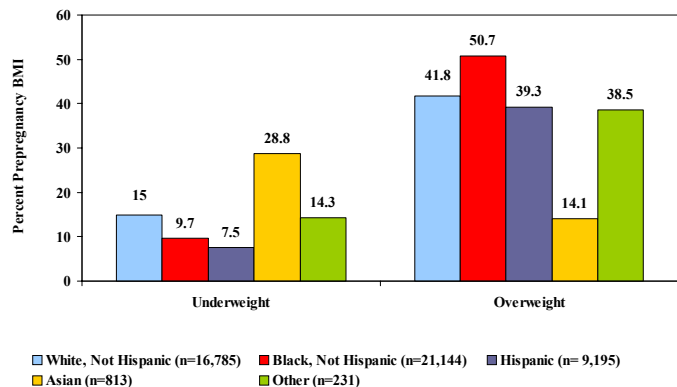
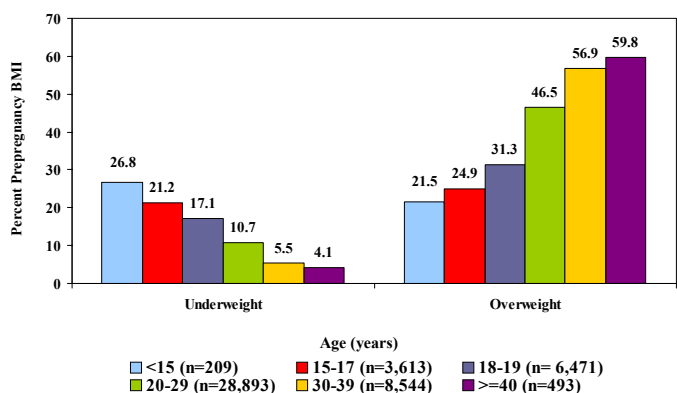


Figure 9: Age Distribution of Georgia PNSS Participants by Prepregnancy BMI, 2002

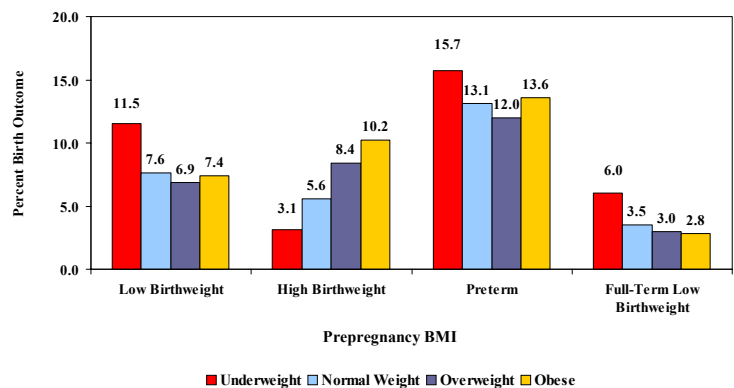


With regard to birth outcome*, women who were underweight during the prepregnant period were more likely to deliver a low birthweight infant (11.5%) compared to women who were normal weight (7.6%) (Figure 10). The prevalence of delivering either a preterm or full-term low birthweight infant was also greater among women who were underweight during the prepregnant period compared to women who were normal weight (Figure 10). In fact, underweight women were almost twice as likely to deliver a full-term low birthweight infant compared to women who were normal weight (Figure 10). Women who were overweight or obese during the prepregnant period were more likely to deliver a high birthweight infant (18.6%) compared to women who were normal weight (5.6%) (Figure 10).

WOMEN WHO WERE OVERWEIGHT OR OBESE DURING THE PREPREGNANT PERIOD WERE THREE TIMES AS LIKELY AS WOMEN OF NORMAL WEIGHT TO DELIVER A HIGH BIRTHWEIGHT INFANT (Figure 10).

“...the risk factor for prepregnancy overweight included Black, non-Hispanic race and/or age 40 years or older, while underweight women tended to be <15 and/or Asian/Pacific Islander race.”

Figure 10: Prevalence of Birth Outcomes by Prepregnancy BMI Among Georgia PNSS Participants, 2002



* Please refer to pages 13 and 14 for definitions on birth outcome and birthweight.

Maternal Weight Gain

Many factors influence the amount of weight a woman gains during pregnancy. These include the woman’s social environment, nutritional quality of the foods consumed, genetics, and prepregnancy weight.³ On average, women gain 3-4 pounds per month during the 2nd and 3rd trimester of pregnancy.³ However, a woman’s recommended weight gain is proportional to her individual needs. Thus, a woman who is overweight or obese during the prepregnant period is usually advised to gain 15-25 lbs. during pregnancy, while women who are underweight during the prepregnant period are advised to gain 28-40 lbs. Women with normal prepregnancy weight are advised to gain 25-35 lbs.

In our analyses we found in both state and national PNSS estimates that approximately one quarter of the participants gained less than ideal weight during pregnancy, while 30% gained greater than ideal weight (Figure 11). The prevalence of women with greater than ideal weight gain was highest among White, non-Hispanic women (37.3%) and lowest among Hispanic women (26.2%) (Figure 12). White, non-Hispanic women were also less likely to gain below ideal weight compared to all other race/ethnic groups (Figure 12).

Figure 11: Prevalence of Maternal Weight Gain During Pregnancy Among Georgia and National PNSS Participants, 2002

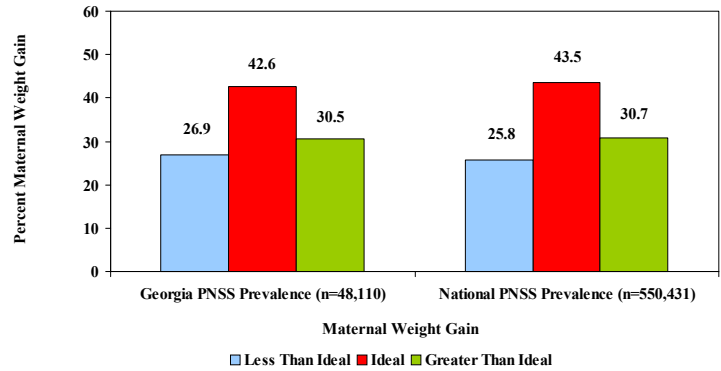
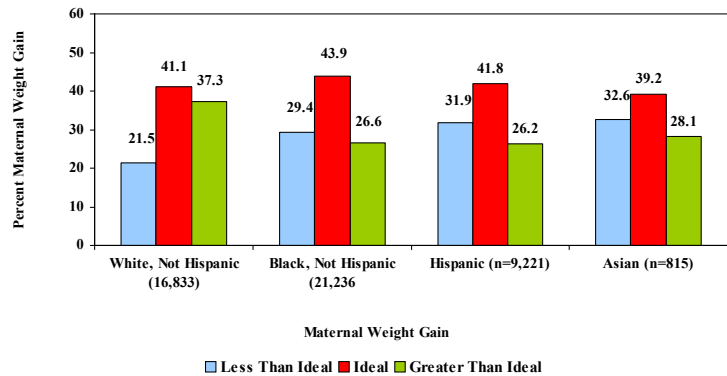


Figure 12: Maternal Weight Gain Among Georgia PNSS Participants by Race/Ethnicity, 2002



Women who gained greater than ideal weight during pregnancy were more likely to be overweight during the prepregnant period compared to women who gained below ideal or ideal weight during pregnancy (Figure 13). Those who gained less than ideal weight were more likely to be underweight during the prepregnant period (Figure 13).

Women who gained less than ideal weight were more likely to deliver a low birthweight, full-term low birthweight, premature or very low birthweight infant compared to women who gained ideal or greater than ideal weight during pregnancy (Figure 14). Likewise, women who gained greater than ideal weight were more likely to deliver a high birthweight infant compared to women who gained less than ideal or ideal weight during pregnancy (Figure 14).

Anemia

In our analyses, anemia was defined as hemoglobin levels less than 12g/dL (adjusted for altitude and smoking).^{4,5} Iron-deficiency anemia, which is the most common form of anemia worldwide, is significantly associated with delivery of low birthweight and preterm infants.⁴ The most significant contributor in the development of iron-deficiency anemia during pregnancy is inadequate weight gain.^{4,5} The prevalence of anemia among our participants was greatest during the 3rd trimester of pregnancy as well as during the postpartum period (Figure 15). These results were seen in both the Georgia PNSS as well as the national PNSS population (Figure 15).

Figure 13: Maternal Weight Gain by Prepregnancy Weight Status Among Georgia PNSS Participants, 2002

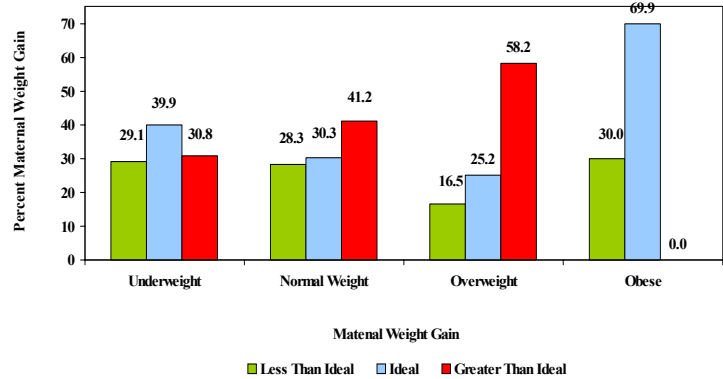


Figure 14: Birth Outcome by Maternal Weight Gain Among Georgia PNSS Participants, 2002

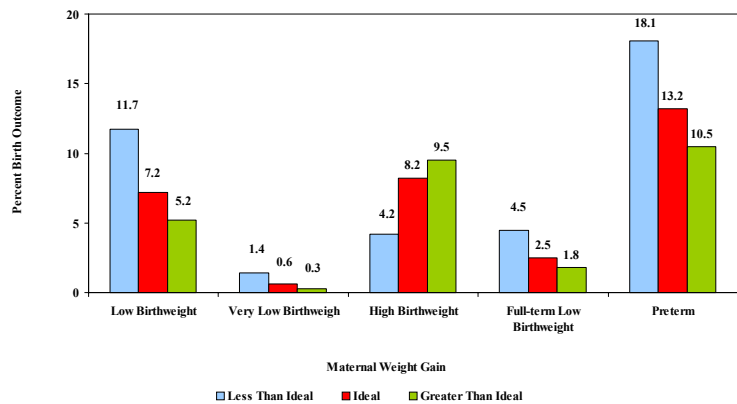
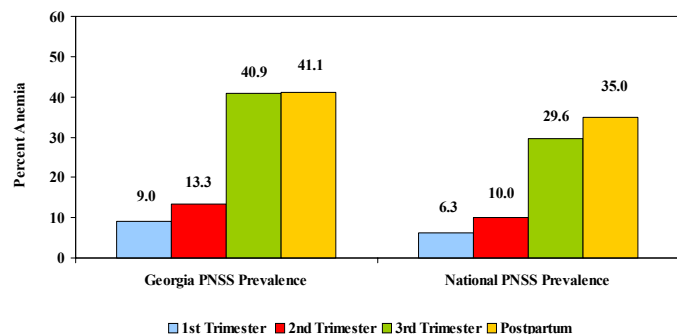


Figure 15: Prevalence of Anemia During the 1st, 2nd, and 3rd Trimester of Pregnancy and Postpartum Among Georgia and National PNSS Participants, 2002



During the 3rd trimester of pregnancy and the postpartum period Black, non-Hispanic women had the highest prevalence of anemia while White, non-Hispanic women had the lowest prevalence (Figure 16). Anemia estimates were not reliably available for Native American/Alaskan Native and Asian/Pacific Islander women.

During the third trimester of pregnancy, the prevalence of anemia decreased with increasing age over the 18-19, 20-29, and 30-39 year old age groups (Figure 17). During the postpartum period, there was only a slight and inconsistent decrease in the prevalence of anemia with increasing age (Figure 17).

Figure 16: Prevalence of Anemia During the 3rd Trimester of Pregnancy and Postpartum Among Georgia PNSS Participants by Race/Ethnicity, 2002

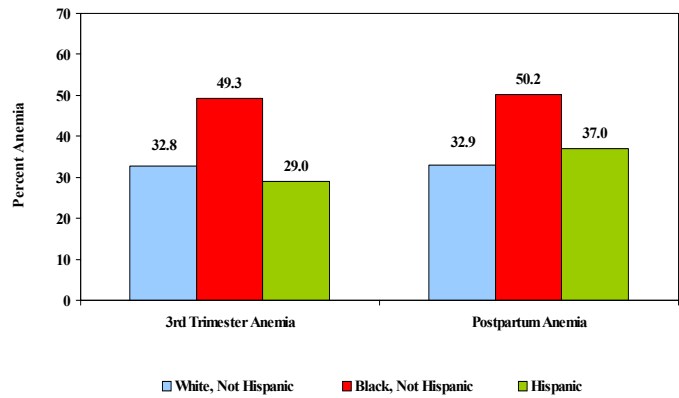
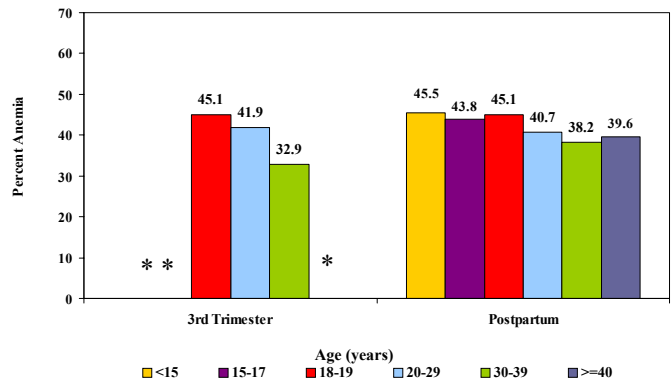


Figure 17: Prevalence of Anemia Among Georgia PNSS Participants by Age, 2002



DURING THE POST-PARTUM PERIOD, BLACK, NON-HISPANIC WOMEN WERE 1.56 TIMES MORE LIKELY THAN WHITE, NON-HISPANIC WOMEN TO BE ANEMIC (Figure 16).

PEDIATRIC HEALTH INDICATORS

Birthweight

A very low birthweight infant is one whose weight is <1500 grams at birth, while a low birth weight infant is one whose weight is <2500 grams at birth. Low birthweight is the single most important factor contributing to infant mortality.⁶ Both low birthweight and very low birthweight infants are more likely than children born normal weight to develop anemia and respiratory disorders and they are significantly more likely to die in the neonatal period.⁶ High birthweight on the other hand is defined as an infant whose birthweight is >4000 grams. High birthweight infants are at significantly increased risk of death and birth injuries compared to infants born normal weight.⁷ High birthweight can also increase an infant's risk of shoulder dystocia.⁷

The proportion of low and very low birthweight infants is lower among Georgia and national PNSS 2002 participants compared to Georgia's general newborn population (Figure 18). However, overall the proportion of infants born low birth weight continues to be higher than that recommended by Healthy People 2010 ranging from 6.8% seen in the PNSS population to 9% seen in the general Georgia newborn population (Figure 18).

In PNSS 2002, Black, non-Hispanic women were twice as likely as a women of Hispanic ethnicity and 60% more likely than a White, non-Hispanic woman to deliver a low birthweight infant (Figure 19). In addition, White, non-Hispanic women were twice as likely as Black, non-Hispanic women to deliver a high birthweight infant (Figure 19).

Figure 18: Prevalence of Very Low, Low, Normal, and High Birthweight Deliveries Among Georgia and National PNSS Participants and the State of Georgia Women with Live Births, 2002

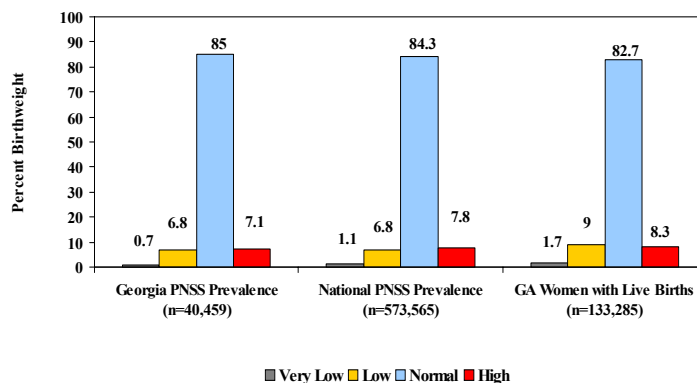
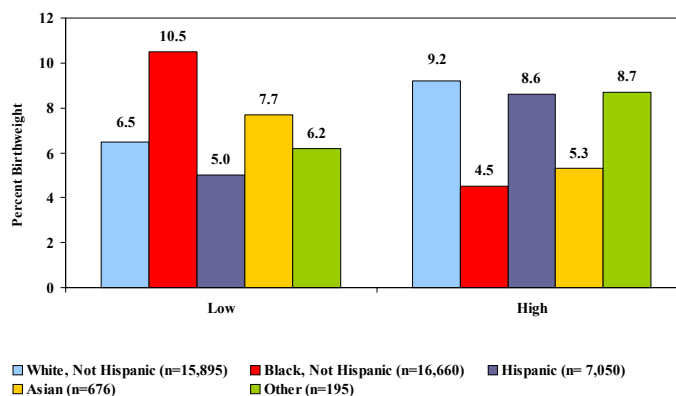


Figure 19: Prevalence of Low and High Birthweight Deliveries Among Georgia PNSS Participants by Race/Ethnicity, 2002



“AN OBJECTIVE OF HEALTHY PEOPLE 2010 IS THE REDUCTION IN LOW BIRTHWEIGHT TO NO MORE THAN 5% OF ALL LIVE BIRTHS.”

Women 40 years or older were 40% more likely to report having a low birthweight infant compared to women <15 years old (Figure 20). Women 30-39 years old were almost 3 times more likely to report having a high birthweight infant compared to women less than 15 years old (Figure 20). In PNSS 2002, the greatest risk factors for low birthweight deliveries included Black, non-Hispanic race and/or age 40 years or older, while risk factors for high birthweight deliveries included being White, non-Hispanic and/or age 30-39 years (Figures 19 & 20).

“High birthweight infants are at a significantly increased risk of death and birth injuries compared to infants born normal weight.”

Birth Outcome

A preterm infant is one who is born < 37 weeks gestation. An infant born prematurely is at an increased risk of neurological and respiratory disorders, ocular diseases, and death.² In PNSS 2002, 13.4% of Georgia PNSS infants were born preterm, compared with 10.7% of infants in the national PNSS prevalence and 12.6% in the general newborn population in the state of Georgia (Figure 21). The prevalence of full-term low birthweight deliveries (i.e., infant with 37 or more weeks gestation and birth weight less than 2500 g) was 3.5% in the Georgia PNSS population and 4% in the national PNSS population. In the general Georgia newborn population, the prevalence of full-term low birthweight deliveries was 2.7% (Figure 21).

Figure 20: Prevalence of Low and High Birthweight Deliveries Among Georgia PNSS Participants by Age, 2002

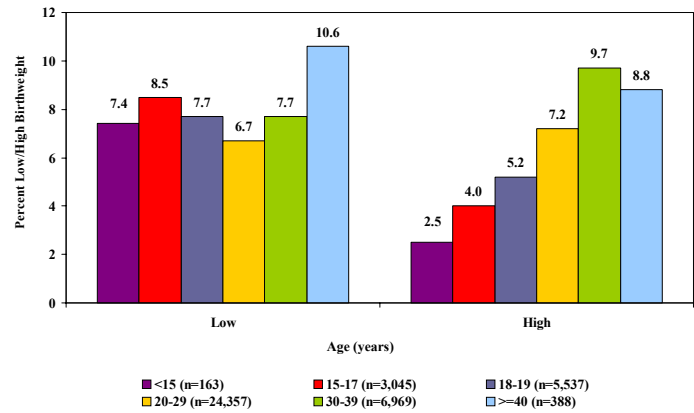
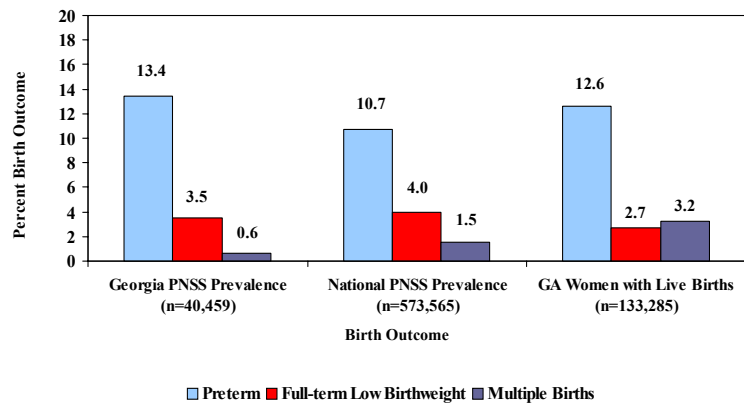


Figure 21: Birth Outcome Among Georgia and National PNSS Participants, and the State of Georgia Women with Live Births, 2002



LOW BIRTHWEIGHT INFANTS ARE AT AN INCREASED RISK OF VISUAL AND HEARING DISABILITY, DEVELOPMENTAL AND COGNITIVE DELAYS AND LEARNING DISABILITIES.⁶

Black, non-Hispanic women had the highest prevalence of preterm deliveries in PNSS 2002 compared to all other race/ethnic groups (Figure 22). In addition, Black, non-Hispanic women were twice as likely to deliver a full-term low birthweight infant compared to Hispanic women and 1.7 times more likely than a White, non-Hispanic woman (Figure 23).

Women younger than 15 years old and those 40 years or older were more likely than those in the intermediate age groups to deliver preterm infants (Figure 24). Women

“...breastfeeding promotes frequent physical contact with the mother.”

“Breastfeeding provides immunity to viral and bacterial diseases, stimulates the infants own immunological defense, decreases the risk of respiratory and diarrheal diseases and decreases the risk of allergy.”

THE HEALTHY PEOPLE 2010 OBJECTIVE IS TO INCREASE THE PROPORTION OF CHILDREN EVER BREASTFED TO 75%.

Figure 22: Preterm Deliveries Among Georgia PNSS Participants by Race/Ethnicity, 2002

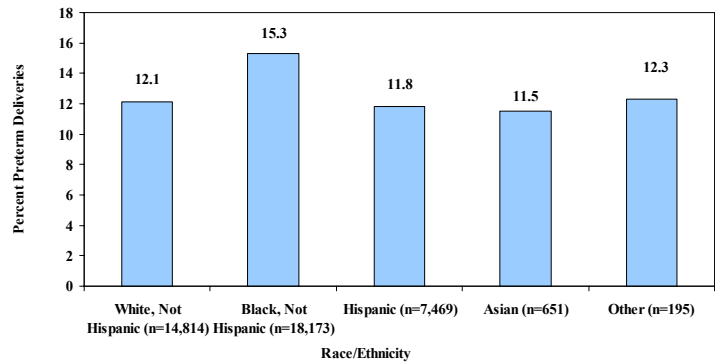
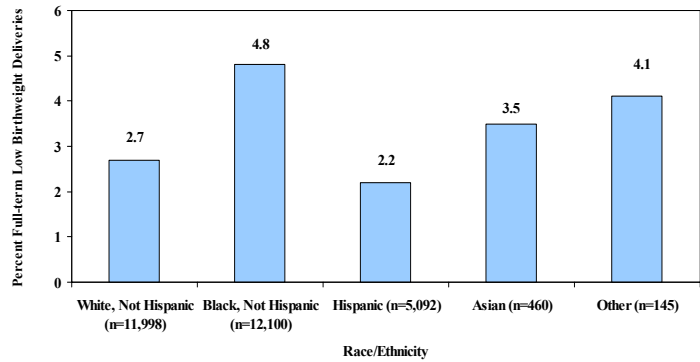


Figure 23: Full-Term Low Birthweight Deliveries Among Georgia PNSS Participants by Race/Ethnicity, 2002



aged 15-17 years were twice as likely to deliver a full-term low birthweight infant compared to those less than 15 years old (Figure 25). The greatest predictors of a preterm delivery included being Black, non-Hispanic, younger than 15 years old, and/or 40 years or older (Figures 22 & 23). Predictors of a full-term low birthweight delivery included Black, non-Hispanic race and/or being aged 15-17 (Figures 24 & 25).

“The greatest predictors of a preterm delivery included being Black, non-Hispanic, younger than 15 years old and/or 40 years or older.”

“...Black, non-Hispanic women were twice as likely to deliver a full-term low birthweight infant compared to Hispanic women...”

Figure 24: Preterm Deliveries Among Georgia PNSS Participants by Age, 2002

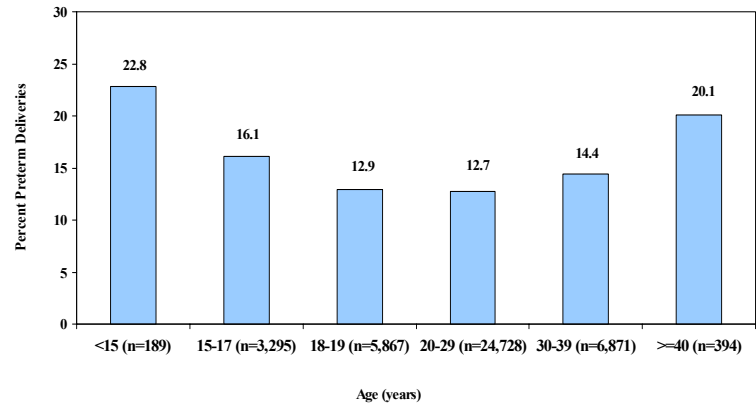
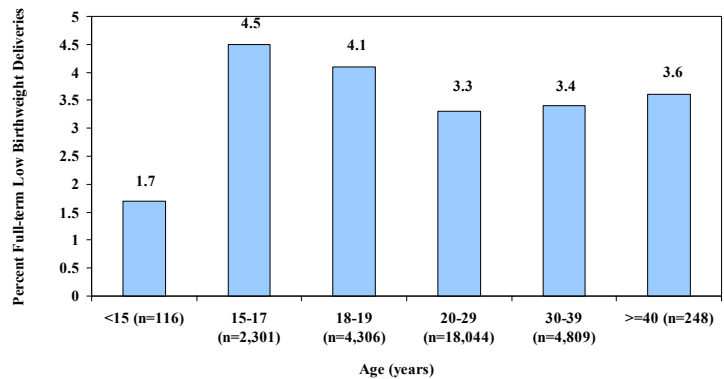


Figure 25: Full-Term Low Birthweight Deliveries Among Georgia PNSS Participants by Age, 2002



INFANT FEEDING PRACTICES

Ever Breastfed

The nutritional and emotional benefits of breastfeeding an infant have been well documented. Breastfeeding provides immunity to viral and bacterial diseases, stimulates the infant's own immunological defense, decreases the risk of respiratory and diarrheal diseases and decreases the risk of allergy.⁸ Most importantly, breastfeeding promotes frequent physical contact with the mother. For the mother, the benefits of breastfeeding include the promotion of physiologic recovery from pregnancy, for example, decreased risk of postpartum hemorrhage.⁸ Among the PNSS 2002 Georgia population, 49.4% reported ever breastfeeding while the national PNSS prevalence was 54.4%. According to the 2000 Pregnancy Risk Assessment Monitoring System (PRAMS), the prevalence of ever breastfeeding in the general Georgia postpartum population was 63.7% (Figure 26). In addition, non-WIC participants were more likely to report having ever breastfed (80.4%) compared to WIC participants 46.8% (data not shown).

The prevalence of having ever breastfed was highest among Hispanic women (73.9%) followed by Asian/Pacific Islander women (52.7%)(Figure 27). Among White, non-Hispanic women the prevalence was 47.5%, while 40.1% of Black, non-Hispanic women reported having ever breastfed in PNSS 2002 (Figure 27). The prevalence of having ever breastfed rose with age and women 40 years or older were twice as likely to report having ever breastfed compared to women <15 years old (Figure 28). In PNSS 2002, the greatest predictor of ever breastfeeding included Hispanic ethnicity and/or age 40 years or older (Figures 27 & 28).

Figure 26: Prevalence of Having Ever Breastfed Among Georgia PNSS, National PNSS, and PRAMS Participants, 2002

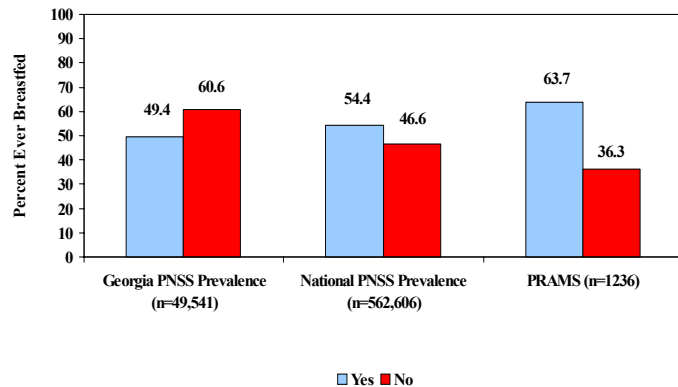


Figure 27: Prevalence of Having Ever Breastfed Among Georgia PNSS Participants by Race/Ethnicity, 2002

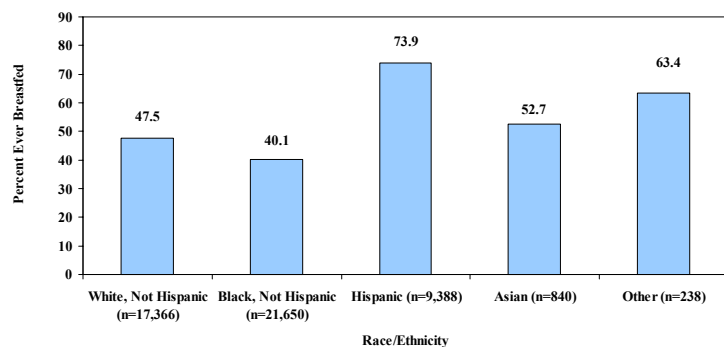
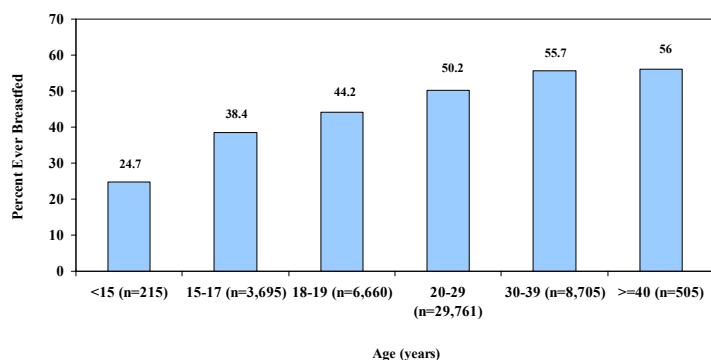


Figure 28: Prevalence of Having Ever Breastfed Among Georgia PNSS Participants by Age, 2002



TRENDS IN PEDIATRIC HEALTH INDICATORS

Prepregnancy Weight

In 2000 the prevalence of prepregnancy overweight was 43% and by 2002 the prevalence increased to approximately 45% (Figure 29). However, the prevalence of prepregnancy underweight decreased between 2000 and 2002, from 13% to 11.5% (Figure 29).

Anemia

Between 2000 and 2002, the prevalence of anemia during the 3rd trimester increased by 10%, from 37.2% to 40.9% (Figure 30). During the postpartum period, there was little change in the prevalence of anemia between 2000 and 2002 (Figure 30).

Figure 29: Trends in the Prevalence of Prepregnancy BMI Among Georgia PNSS Participants, 2000-2002

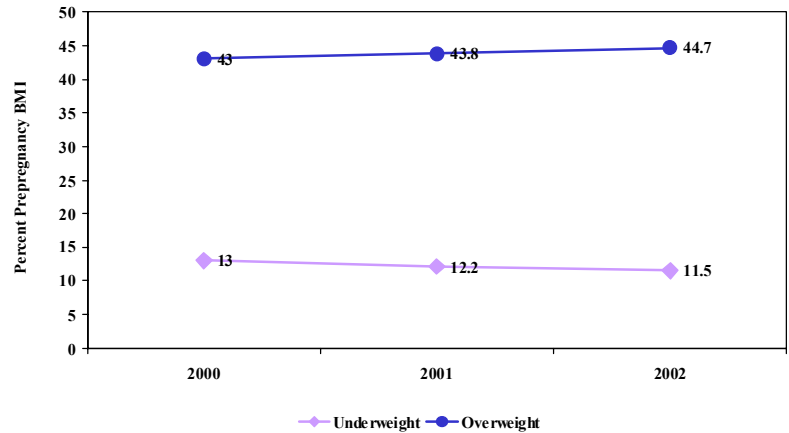
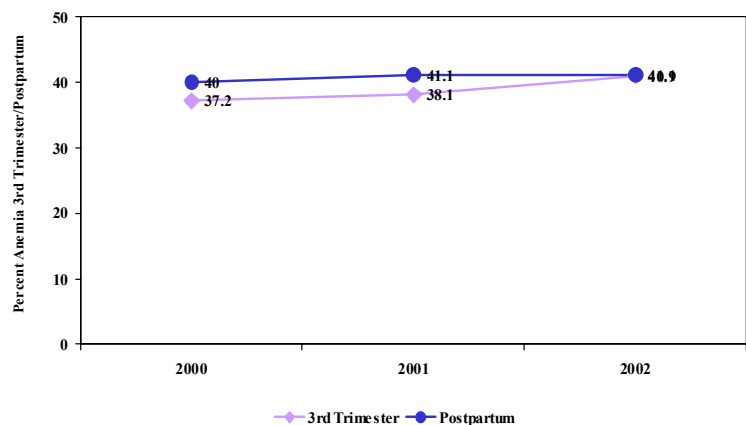


Figure 30: Trends in the Prevalence of Anemia During the 3rd Trimester of Pregnancy and Postpartum Among Georgia PNSS Participants, 2000-2002



TRENDS IN PEDIATRIC HEALTH INDICATORS

Birthweight

Between 2000 and 2001 the prevalence of low birthweight among PNSS participants decreased from 8.1% to 7.9% (Figure 31). There has been no change in prevalence of low birthweight between 2001 and 2002 (Figure 31).

Birth Outcome

Over the past three years there appears to be very little change in the prevalence of preterm births as well as the prevalence of delivering a full-term low birthweight infant (Figure 32).

Figure 31: Trends in the Prevalence of Low and High Birthweight Deliveries Among Georgia PNSS Participants, 2000-2002

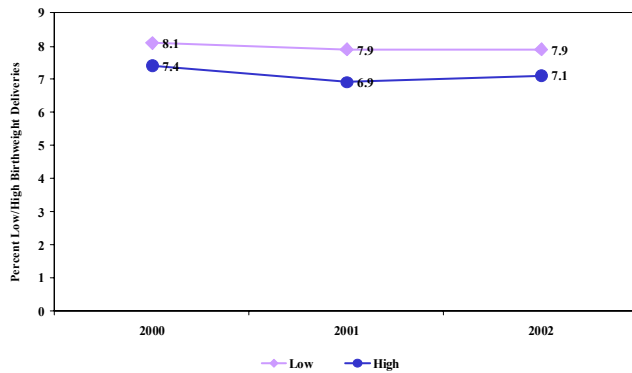
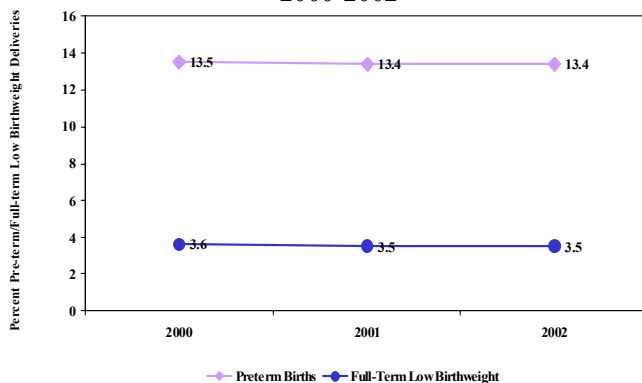


Figure 32: Trends in the Prevalence of Preterm and Full-Term Low Birthweight Deliveries Among Georgia PNSS Participants, 2000-2002

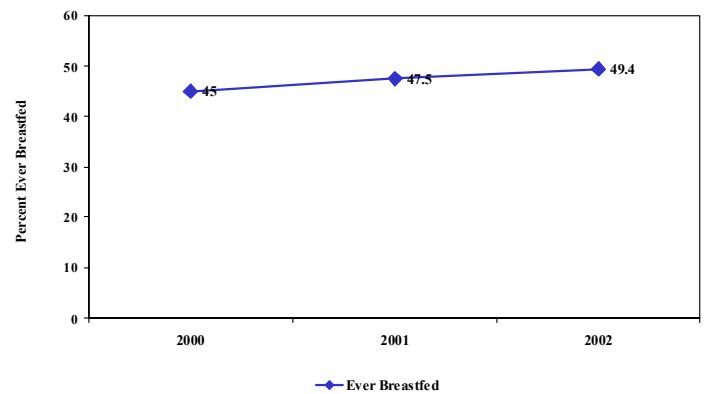


TRENDS IN INFANT FEEDING PRACTICES

Ever Breastfed

Between 2000 and 2002, the prevalence in women reporting that they had ever breastfed their infant increased from 45% to 49.4% (Figure 33). This represents a 10% increase in prevalence over the past 3 years. However, the rate is well under the Healthy People 2010 target of 75%.

Figure 33: Trends in the Prevalence of Having Ever Breastfed Among Georgia PNSS Participants, 2000-2002



DISCUSSION

Maternal Health Indicators

The majority of women in both the PNSS and the general Georgia population of women with live births reported seeking medical care during the 1st trimester of pregnancy. A large proportion of Georgia and national PNSS 2002 participants reported being overweight or obese during the prepregnancy period, with Black, non-Hispanic women and those 40 years or older being more likely to have this risk factor. In addition, Asian/Pacific Islander women as well as those younger than 15 years old tended to report being underweight during the prepregnant period. The consequences of prepregnancy overweight or obesity include the development of gestational diabetes, hypertension, venous thromboembolism or having a difficult delivery.⁹ Overweight or obese women may also be at greater risk of delivering a high birthweight infant compared to women who are ideal weight.² Women who are underweight during the prepregnant period are more likely to deliver low birthweight or full-term low birthweight infants compared to women who are ideal weight.²

Adequate weight gain during pregnancy is vital to the successful growth and development of the fetus. Despite improved access to nutritious foods and nutritional supplements during pregnancy, approximately one quarter of Georgia and national PNSS 2002 participants reported gaining less than ideal weight during pregnancy. A large proportion of participants who reported gaining less than ideal weight during pregnancy included women of Hispanic ethnicity and Asian/Pacific Islanders. The consequences of gaining less than ideal weight during pregnancy include delivery of a low birthweight, full-term low birthweight or premature infant, findings clearly shown in our data.

Approximately 30% of PNSS 2002 participants in both the Georgia and the national population reported gaining greater than ideal weight during pregnancy. White, non-Hispanic women compared to all other race/ethnic groups were 40% more likely to report gaining greater than ideal weight during pregnancy.

One of the greatest risk factors for gaining greater than ideal weight during pregnancy includes being overweight during the prepregnant period. Approximately 58% of the Georgia PNSS 2002 participants who were overweight during the prepregnant period gained more weight than ideal during pregnancy. This compares with 41.2% of those with normal weight and 30.8% of those underweight during the prepregnant period gaining more weight than ideal during pregnancy. Women who gain greater than ideal weight during pregnancy compared to those who gain ideal weight during pregnancy are more likely to deliver high birthweight infants, and those women may also be at an increased risk of developing hypertension or diabetes during pregnancy.⁹

Among our participants, the prevalence of anemia was greater during the 3rd trimester of pregnancy and postpartum compared to the 1st and 2nd trimester. Iron is usually more readily absorbed by the fetus during the latter stages of pregnancy to help support its growth and development.¹⁰ During the postpartum period, iron is usually absorbed from the mother into the breast milk to support the needs of the infant.¹⁰ Thus, one may expect to see a greater prevalence of anemia during the 3rd trimester of pregnancy and postpartum. Additionally, Black, non-Hispanic women compared to White, non-Hispanic and Hispanic women were also more likely to be anemic during the 3rd trimester of pregnancy and postpartum. Although the exact mechanism behind the increased risk of developing postpartum anemia among Black, non-Hispanic women is not well understood, evidence suggests that differing absorption mechanisms for iron in the mother's intestines within differing race/ethnic groups may partially explain these findings.¹¹

PEDIATRIC HEALTH INDICATORS

Despite improvements in access to prenatal care there continues to be a dramatic racial/ethnic disparity in birth outcome. Black, non-Hispanic women are at an increased risk of delivering a low birthweight or preterm infant, while White, non-Hispanic women continue to be at an increased risk of delivering high birthweight infants. The reasons for this disparity remain unclear; however, both social and environmental factors may play large roles.¹² Black, non-Hispanic women are more likely than White, non-Hispanic women¹² to report experiencing a greater number of acute life events (stress, e.g. limited financial resources) and these acute life events may increase a Black, non-Hispanic woman's risk of developing certain chronic health conditions such as hypertension¹³ which may in turn increase the risk of delivering a preterm or low birthweight infant.^{14,15,16,17}

Among White, non-Hispanic women, the increased prevalence of delivering a high birthweight infant may be attributable to weight gain during pregnancy. Our analyses show that White, non-Hispanic women compared to all other race/ethnic groups were more likely to gain greater than ideal weight. Studies have shown that women with greater than ideal weight during pregnancy are more apt to believe that increased weight gain during pregnancy will benefit the infant.¹ However, gaining greater than ideal weight during pregnancy may lead to the delivery of a high birthweight infant; high birthweight infants are at an increased risk of death or birth injuries compared to children born normal weight.

Maternal age may be an independent risk factor for infant birthweight.¹⁸ Women under 15 years of age compared to those 40 years or older are less likely to deliver a low birthweight, high birthweight or full-term low birthweight infant. However, women younger than 15 years compared to women 40 years or older may be slightly more likely to deliver preterm. Studies have shown that women over 35 years compared to women 25-29 years may be at an increased risk of delivering a

low birthweight infant;¹⁹ however, older age may not be an independent risk factor for preterm delivery.¹⁹ Although the exact mechanism behind this age disparity is unknown, obstetric complications may be the greatest predictor of this association.²⁰

Women of Hispanic ethnicity compared to women of any other racial/ethnic groups are more likely to report having ever breastfed. Conversely, women younger than 15 years old compared to women in all other age categories are least likely to report having ever breastfed. Within the general postpartum population in the State of Georgia, non-WIC participants were more likely to report ever breastfeeding compared to WIC participants. Many studies have found that a woman's decision to breastfeed is influenced by a myriad of factors, including the father's attitude towards breastfeeding, the quantity of milk and time constraints.^{21,22} The grandmother's attitude towards breastfeeding may also be a significant determinant of a mother's decision to breastfeed.²³ Thus, among women least likely to report having ever breastfed, one or more of these factors may be negatively affecting their decision to breastfeed.

TRENDS

Over the past three years, there has been very little change in the prevalence of prepregnancy underweight or overweight. There have also been few changes in the prevalence of low and high birthweight deliveries as well as full-term low birthweight and preterm deliveries. However, there has been a slight increase in the prevalence of anemia during the 3rd trimester of pregnancy. In addition, the prevalence of women reporting that they have ever breastfed has increased over the past three years. The increase in the prevalence of women reporting ever breastfeeding may be attributable to the numerous breastfeeding support programs available to women enrolled in the WIC program.

RECOMMENDATIONS

To address the issue of prepregnancy weight, counseling for women who plan to have more children should include weight control and management.

Women who are underweight during the prepregnant period should be encouraged to maintain normal weight-for-height before conception to ensure delivery of an infant within normal weight standards.

Likewise, women who are overweight or obese during the prepregnant period should be encouraged to lose weight before conceiving to avoid pregnancy related complications.

Among women delivering high birthweight infants, increased efforts should be made to educate them about the importance of not gaining more weight than necessary during pregnancy. Many women believe that high weight gain during pregnancy benefits the infant. However, if women understand the potential medical risks of gaining too much weight during pregnancy and its effect on the infant, they may be amenable to change.

Increased counseling efforts to address dietary practices may be helpful in decreasing the rates of anemia among women at risk of developing anemia. Such counseling should focus on helping women understand the role of food combinations and its importance in improving iron absorption. In addition, improved referral and follow-up practices among women at risk of developing anemia may help providers identify and treat women early in the course of developing anemia thereby avoiding any long-term effects.

Peer breastfeeding education may be helpful in improving breastfeeding practices among women who are least likely to breastfeed their infant.²⁴ Peer breastfeeding counseling programs have been shown to help increase breastfeeding initiation rates among populations of women least likely to commence breastfeeding.²⁵ Women who attend peer breastfeeding counseling programs are significantly more likely to initiate breastfeeding and breastfeed for a longer

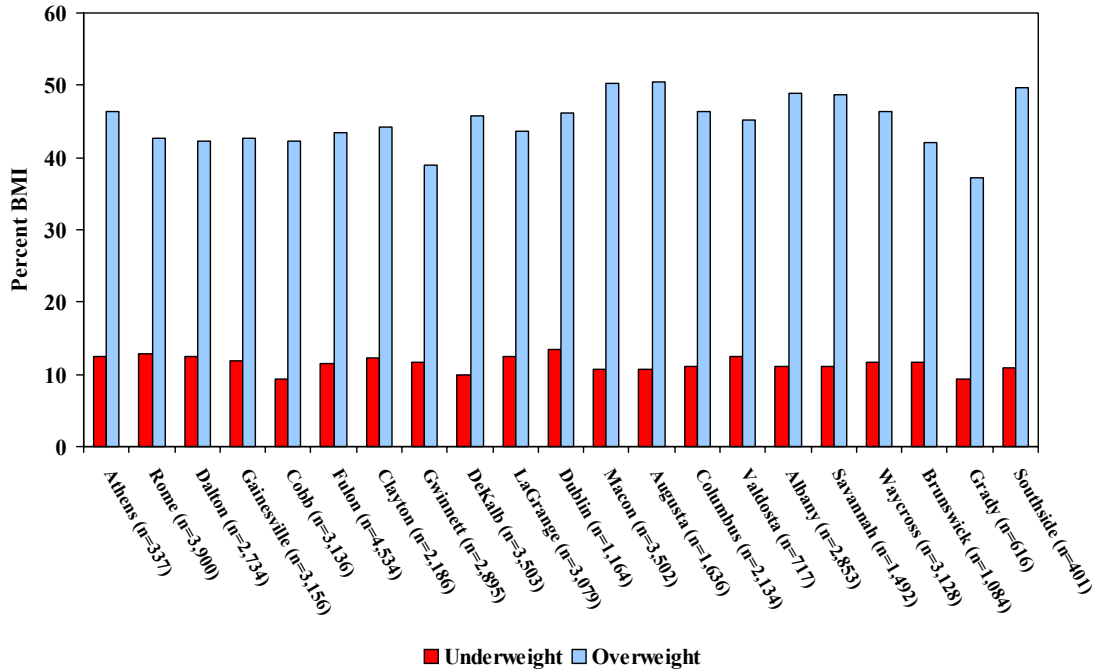
duration compared to those not attending peer breastfeeding counseling programs.²⁶

In addition, the adoption of breastfeeding friendly environments, for example in the workplace, the malls, and in restaurants, may help to increase breastfeeding rates. Population based breastfeeding promotion activities may be useful in educating the public about the importance of breastfeeding. Such programs may help increase its acceptance by promoting the idea that breastfeeding is a viable means of providing nutrition to the infant.

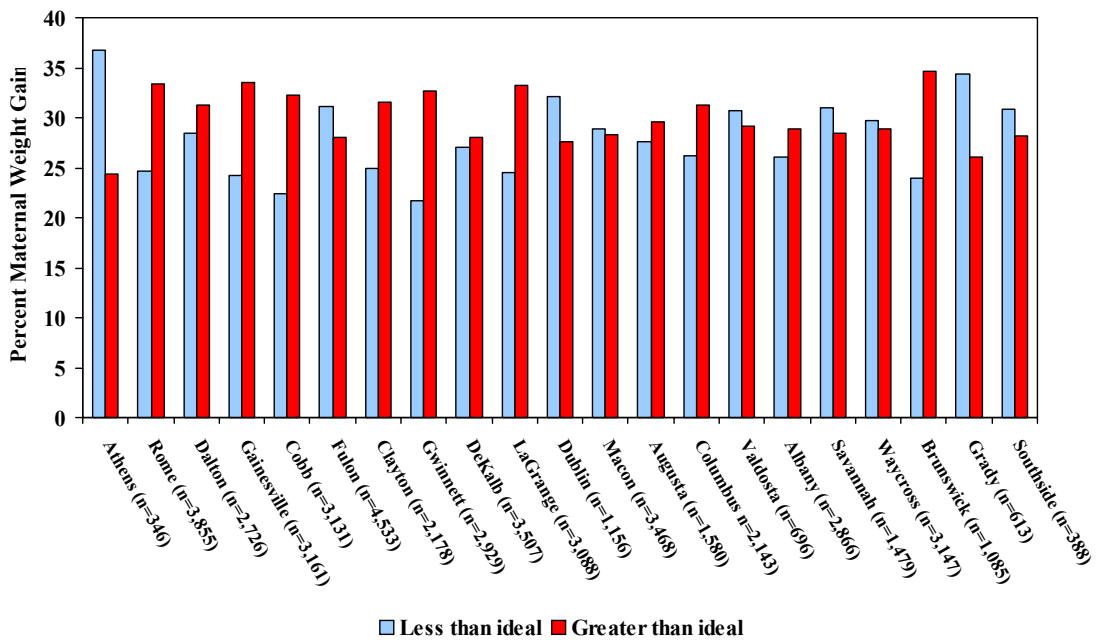
LIMITATIONS

Data from the 2002 PNSS do not reflect the health and nutritional experience of all low-income women in the state of Georgia. There are several enrollment criteria, inherent to the WIC Program, which limit the inclusion of all low-income women into the program. In addition, some women who may have been enrolled in the WIC program during the prenatal period may fail to meet the eligibility criteria during the postpartum period; therefore, their experience will not be captured. Despite these limitations, the information contained in this report is useful because it acts as a catalyst in helping us determine milestones gained in addressing the most poignant health issues facing one of the state's most vulnerable populations, low-income pregnant women.

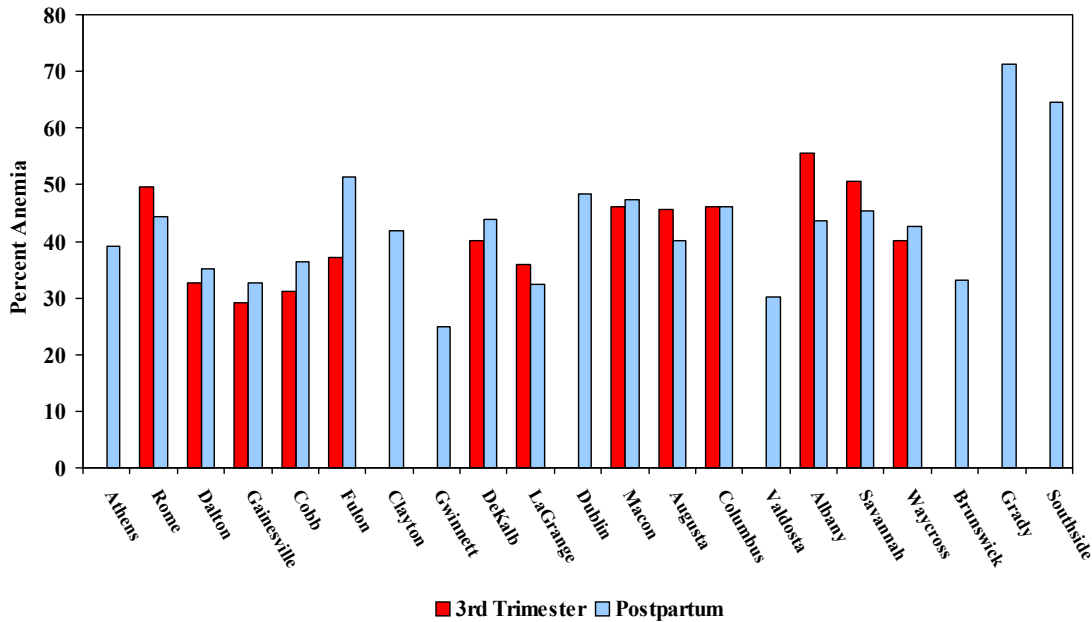
Prevalence of Prepregnancy BMI
 Among Georgia PNSS 2002 Participants
 by Local WIC Agency



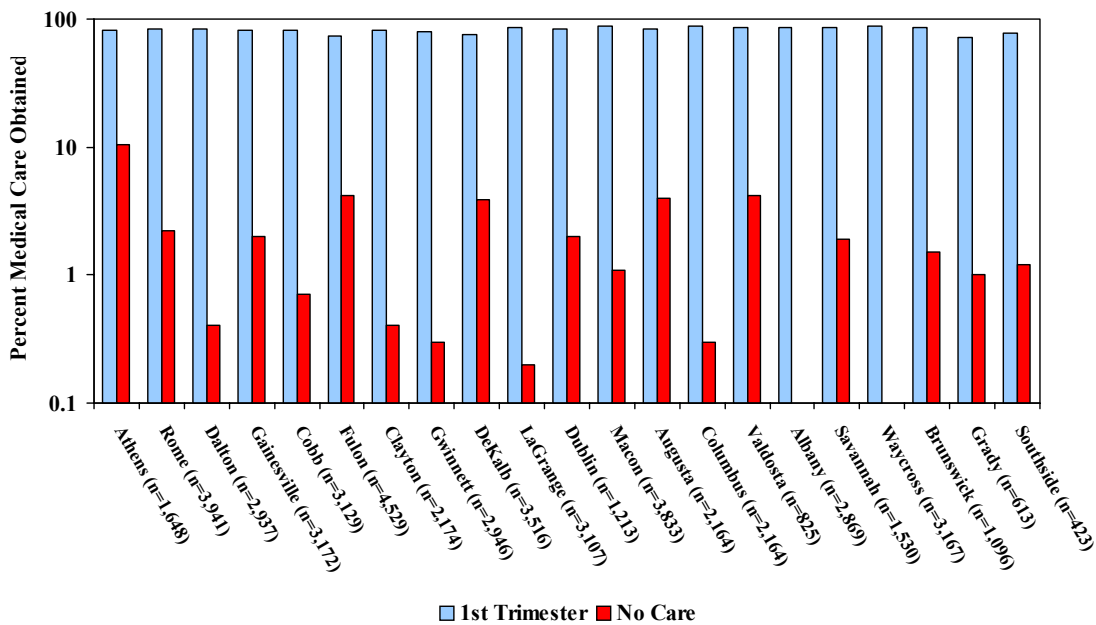
Prevalence of Maternal Weight Gain During Pregnancy
 Among Georgia PNSS 2002 Participants
 By Local WIC Agency



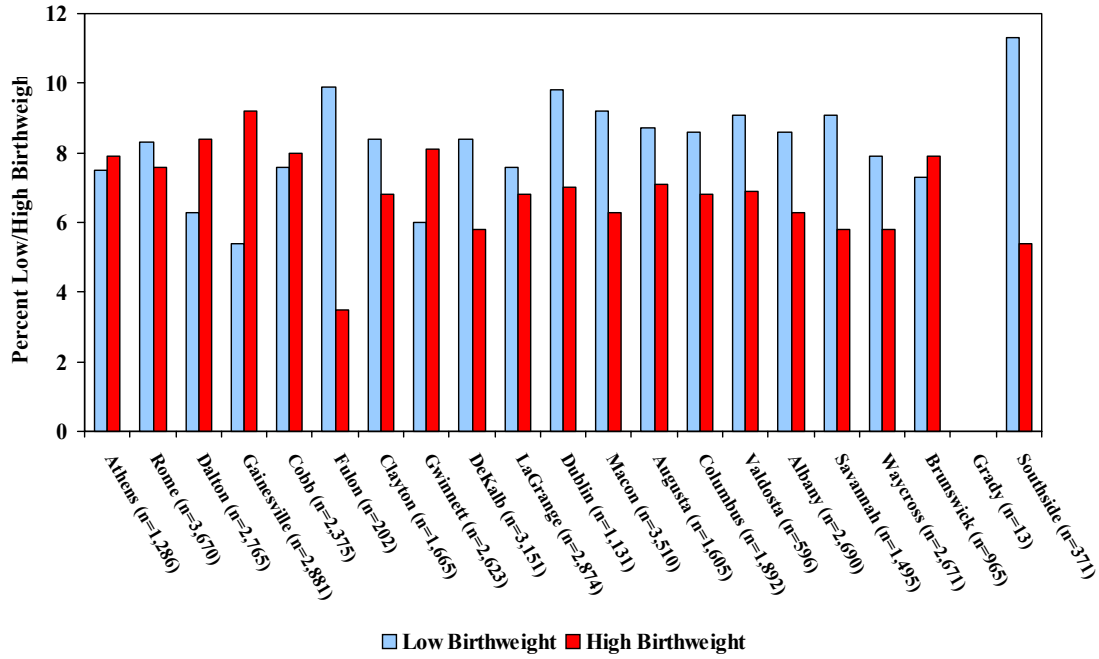
Prevalence of Anemia During the 3rd Trimester and Postpartum
 Among Georgia PNSS 2002 Participants
 By Local WIC Agency



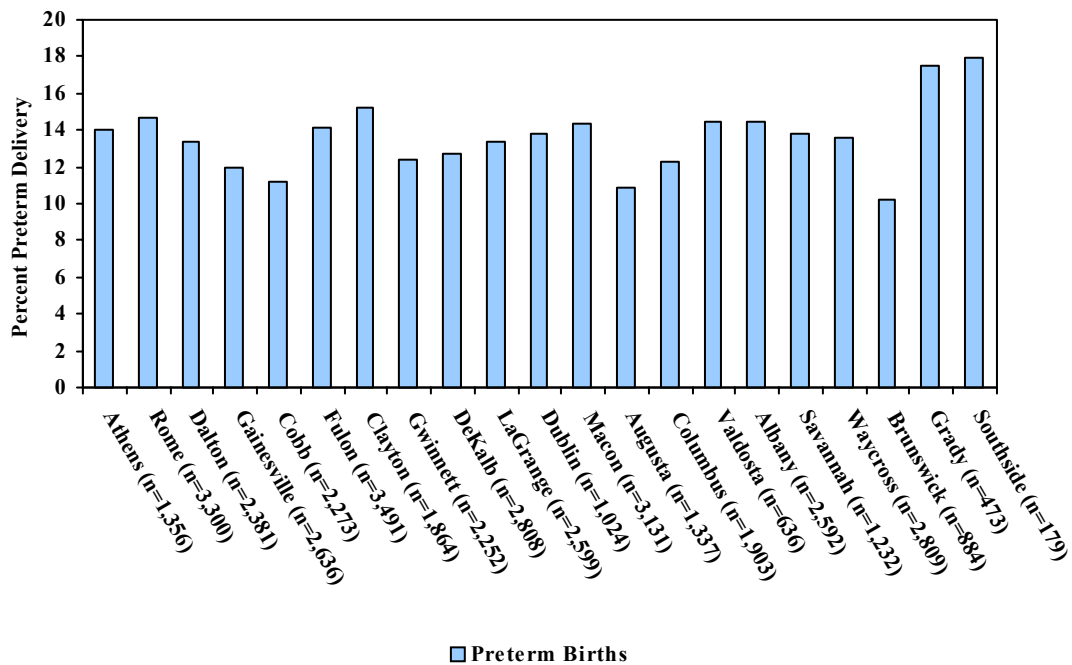
Prevalence of Obtaining Prenatal Care During the 1st Trimester of Pregnancy
 Among Georgia PNSS 2002 Participants
 by Local WIC Agency



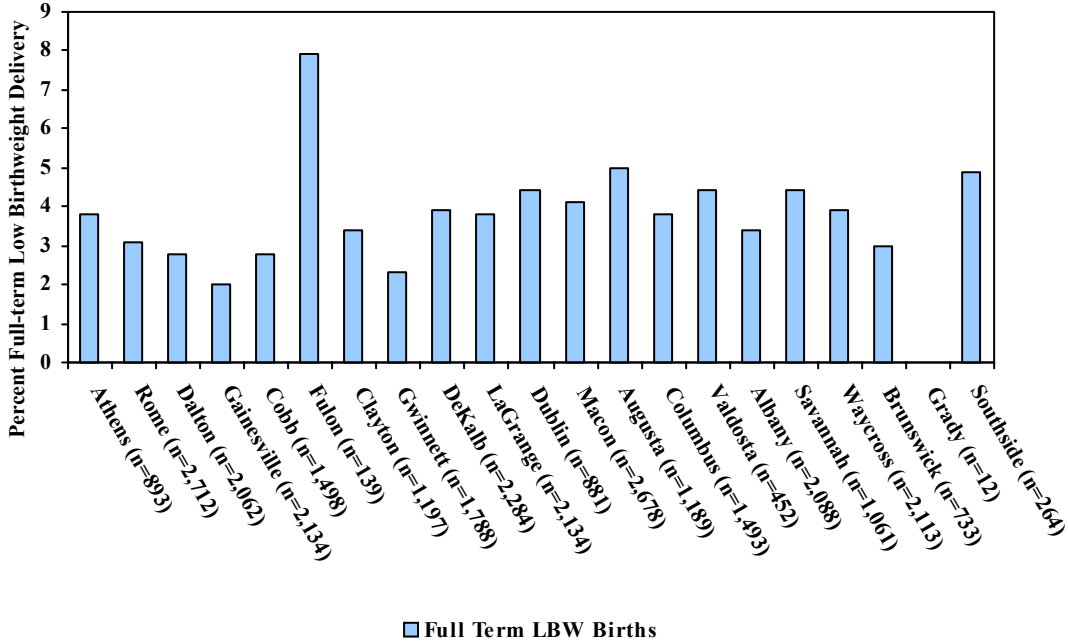
Prevalence of Infant Birthweight
Among Georgia PNSS 2002 Participants
by Local WIC Agency



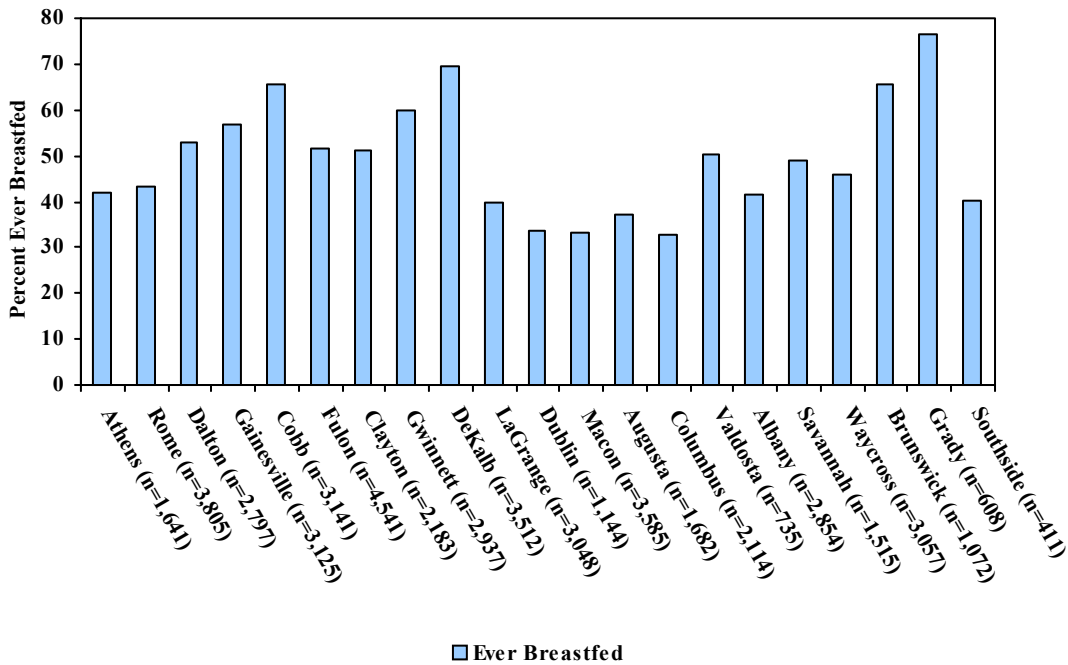
Prevalence of Preterm Delivery
Among Georgia PNSS 2002 Participants
by Local WIC Agency



**Prevalence of Full-term
Low Birthweight Delivery**
Among Georgia PNSS 2002 Participants
by Local WIC Agency



Prevalence of Ever Breastfed
Among Georgia PNSS 2002 Participants
by Local WIC Agency



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