

STATE OF NORTH CAROLINA PREGNANCY NUTRITION SURVEILLANCE REPORT 1998

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Facts in Brief

This report describes pregnancies of 55,847 low income women who delivered in North Carolina in 1998.

DEMOGRAPHIC BACKGROUND

- More than one-half of all women were unmarried.
- More than a third of the women had less than a high school education.
- The proportion of white women (47%) was lower and the proportion of black women (39%) was higher than the total population of NC women who gave birth in 1998 (71% and 25%, respectively).
- The percentage of pregnancies to Hispanic women in 1998 increased by 11% over 1997.

HEALTH CARE PROFILE

- Of the women who participated in the WIC Program (99%) approximately 83% of them obtained prenatal care from private health care providers.
- The majority of women (77%) began prenatal care in the 1st trimester but only 44% enrolled in WIC during the 1st trimester.
- Adolescents under 18 years of age had the lowest rates for entering prenatal care in the first trimester (66%) as compared to all other women (79%).
- Hispanic adolescents had the highest rates of inadequate prenatal care (9%) compared to white adolescents who had the lowest (3%).
- Over 60% of the adolescent women became pregnant within 12 months of the previous pregnancy as compared to all other women (27%).

HEALTH AND NUTRITION BEHAVIORS PROFILE

- White adolescents under 18 years of age were nearly five times more likely to smoke cigarettes during their pregnancies than black adolescents (37% vs. 8%).
- The prevalence rates of smoking during pregnancy were higher among Whites (37% and Native Americans (34%) and lowest among Hispanics (4%) and Asians (6%).
- Nearly 42% of women were overweight prior to pregnancy, with women 35 years of age or older having the highest prevalence (55%).
- Black women had a prevalence rate of iron-deficiency anemia (19%) nearly three times as high as that for white women (7%).
- The incidence of breastfeeding initiation nearly doubled from 17% in 1991 to 31% in 1998. The highest breastfeeding rate was among the hispanic women (61%) and lowest (22%) among the blacks.

State Profile - North Carolina

Program Profile	Number	Percent
Participants in WIC only	46567	83
Participants in both WIC and Maternal Clinics	8685	16
Participants in Maternal Clinics Only	580	1
Total participants	55832	100
Demographic Background	Number	Percent
Mothers under 18 years of age	5170	9
Mothers over 35 years of age	2787	5
Unmarried mothers	30084	54
Mothers not completing high school	19539	35
White mothers	26176	47
Black mothers	21716	39
Native American mothers	1402	3
Hispanic mothers	5672	10
Asian mothers	852	2
Pregnancy History	Number	Percent
Mothers with no previous live births	23927	43
Mothers with 3 or more previous live births	5241	9
Mothers with 12 months or less between pregnancies	9395	28
Nutritional and Health Care Profile	Number	Percent
Mothers who smoked during pregnancy	13617	24
Mothers underweight prior to pregnancy *	6866	16
Mothers overweight prior to pregnancy *	18530	42
Mothers with iron-deficiency anemia *	4786	12
Mothers with no prenatal care	532	1
Mothers with inadequate prenatal care	2678	5
WIC mothers enrolling in WIC in 3rd trimester *	8393	19
Pregnancy Outcome Profile	Number	Percent
Babies with very low birthweight (under 1500 grams)	1179	2
Babies with low birthweight (under 2500 grams)	5495	10
Babies with high birthweight (over 4500 grams)	668	1
Babies with low 5 minute Apgar scores, (values less than 7)	1159	2
Fetal deaths	325	1
Twins or Triplets	1693	3
Mothers breastfeeding at postpartum visit *	14702	31

* Includes only mothers enrolled in WIC.

Introduction

This Pregnancy Nutrition Surveillance report provides data on maternal nutrition, access to health care, pregnancy history and pregnancy outcome for about 56,000 low-income North Carolina women who delivered their babies during calendar year 1998. The majority of these women were served by the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) during either the prenatal or postpartum period. WIC targets low-income women who are at nutritional risk for poor pregnancy outcome and provides supplemental food, nutrition education, and referrals to prenatal care.

Compared to 1997 the number of women clients in WIC increased by 2,016 women in 1998. The program profile and demographic background of the low-income pregnant women covered by this report were almost similar to the report in 1997 (***State Profile***). Adolescents who were less than 18 years of age at the time of delivery comprised 9% of total participants, and women aged 35 years and older comprised 5% of total participants in 1998. ***Fifty-four percent of low-income women who gave birth in 1998 were unmarried.*** The racial distribution of low-income births was similar to the preceding years with the exception of ***hispanic mothers which continued to show an increase in North Carolina WIC program.*** In 1998, 47% of women in the PNSS were white, 39% black, 3% Native American, 10% hispanic and 2% asian. The proportion of white women was lower and the proportion of black women was higher in the 1998 PNSS than in the general population of North Carolina who gave birth in 1998 (71% white and 25% black). ***The proportion of women who had not completed a high school education remained unchanged since 1994 at 35%.***

The pregnancy histories of the low-income women who delivered in 1998 were similar to those low-income women who delivered in 1997. ***Forty-three percent of women had no previous live births*** and 9% had three or more previous live births.

The interval between a previous birth and conception of the current pregnancy was less than 12 months for 28% of those women who had at least one previous live birth.

We did not observe any significant improvements in the nutritional and health care profile of low-income pregnant women between 1997 and 1998. The prevalence of smoking during pregnancy slightly declined (24%) from the preceding year. The prevalence of iron-deficiency anemia, however, has remained the same at (12%). The prevalence of prepregnancy underweight declined from 17% to 16% whereas the prevalence of prepregnancy overweight increased to 42% in 1998 from 39% in 1997. The proportion of women receiving inadequate prenatal care and no prenatal care has remained the same at 5% and 1%, respectively, since 1997. Third trimester enrollment in the WIC program has remained stable at 19% for several years.

The incidence of low birthweight among the low-income population of North Carolina continued to remain steady at 10% in 1998. The prevalence of twins and triplets had been stable since 1991 at 3%. ***The prevalence of breastfeeding at the WIC postpartum visit continue to increase (31% in 1998).***

The remainder of this report consists of detailed graphs and tables which provide an in-depth description of the pregnancy histories, nutritional status, access to health care and pregnancy outcomes of low-income women in North Carolina. Interpretation and discussion of the report findings are included in the text of the report, concluding with public health strategies to improve maternal and infant health in North Carolina.

**PREGNANCY
RISK FACTORS
and OUTCOMES**

Maternal Cigarette Smoking

Maternal cigarette smoking during pregnancy is one of the most important risk factors for low birthweight and infant mortality. Carbon monoxide in cigarette smoke binds to hemoglobin and limits the availability of oxygen to the developing fetus. Lack of oxygen causes fetal growth retardation. Maternal smoking during pregnancy doubles the risk of delivering a low birthweight infant and is a contributing factor to 20% to 40% of low-birthweight infants born in the United States ⁽¹⁾. In North Carolina smoking among low-income pregnant women who gave birth in 1998 is still high (24%).

Smoking by women over 25 years of age is associated with higher incidence of preterm delivery, when compared with smoking by women aged 25 years or younger ⁽²⁾. Women aged 35 years of age and older had the highest rate of smoking (32%), as shown in **Figure 5**. Very young women under 18 years old were the least likely to smoke, although the prevalence of smoking in this group was still significant (20%). There were dramatic differences in prevalence of smoking by ethnicity (**Figure 6**). **Whites and Native Americans had very high rates of smoking (37% and 34%, respectively), while Asians and Hispanics had relatively low rates of smoking (6% and 4%, respectively)**. Black women had an intermediate prevalence of smoking (14%). Compared with 1997, smoking rates in 1998 have remained essentially the same among all ethnic groups. **Figure 7** shows the prevalence of cigarette smoking by level of education. Women with less than a high school education had a high prevalence of smoking (31%) and were over twice more likely to smoke than women with more than 12 years of school (15%).

The pattern of higher smoking rates among older women varied noticeably by ethnicity (**Table 1**). Among whites and Native Americans, the prevalence of smoking was high for all ages. **White women under age 18 had a high rate of smoking (37%). In contrast, only 14% of Black women under age 18 smoked during their pregnancies**. However, the rate of smoking among Blacks increased dramatically with

age. Black women aged 35 years and older were over three times more likely to smoke than Black adolescents (27% vs. 8%).

Level of education was a strong predictor of cigarette smoking (**Table 2**). Among all ethnic groups except the Hispanics, women who had completed more than 12 years of school had the lowest rates of smoking. A large proportion of white women (51%) and Native American women (42%) with less than a high school education smoked during their pregnancies. Twenty-one percent of Black women with less than a high school education smoked.

Overall, women who smoked cigarettes during pregnancy were more likely to give birth to a low birthweight baby compared with non-smokers (13% vs. 9%), as shown in **Figure 14**. Maternal cigarette smoking and prepregnancy underweight each had independent effects on the risk of low birthweight (**Figure 15**). Infants of underweight smokers had the highest incidence of low birthweight (16%), and infants of overweight non-smokers had the lowest incidence (8%).

Late or Inadequate Prenatal Care

Early and comprehensive prenatal care has been shown to positively affect pregnancy outcomes among low-income women. **Figure 8** shows the trimester of first prenatal visits as recorded on the birth certificate. According to this data, 1% of low-income women received no prenatal care, about 3% began prenatal care in their third trimester, and about 19% began care in their second trimester. **The majority of women (77%) reported their first prenatal visit in the first trimester.**

Women aged less than 18 years were least likely to receive prenatal care in the first trimester (66%) than women in other age groups. Consequently this group was most likely to begin prenatal care in the third trimester (5%) than women in other age groups, as shown in **Table 3**. White women were more likely to begin prenatal care earlier than any other race. Level of education was positively associated with first prenatal visit in the first trimester. Women with more than a high school education had the highest rate of early prenatal care (85%).

Prenatal care was considered inadequate when a woman's first prenatal visit was in the second or third trimester and she had too few prenatal care visits. Overall, 5% of women received inadequate prenatal care (see **State Profile**). The percent of women with inadequate prenatal care for each maternal ethnic group is presented in **Figure 18**. White women had the lowest rate of inadequate prenatal care (3%) and **Hispanic women were the most likely to have received inadequate prenatal care (9%)**. Within each ethnic group, women aged less than 18 years were more likely than older women to have received inadequate prenatal care (**Table 15**) but black adolescents and Hispanic adolescents had the highest rates of inadequate prenatal care (9% and 10%). Level of education was also associated with inadequate prenatal care in every ethnic group (Table 16). Women with less than a high school education were more likely to have received inadequate prenatal care than women with at least 12 years of school. Among Hispanic women, 12% of those with less than a high school education received inadequate prenatal care.

Late WIC Enrollment

Prenatal participation in the WIC program has been shown to positively affect pregnancy outcomes among low-income women. Dietary intake and prenatal weight gain are better for women who enroll in the WIC program than for those who do not ^(3,4) However, ***the majority of low-income women who gave birth in 1998 did not enroll in WIC until their second (37%) or third (19%) trimester (Figure 9).*** Compared to older women (30+ years of age), adolescents under 18 years were less likely to enroll in WIC during their third trimester (20% vs. 17% **Table 4**).

There were also ethnic differences in trimester of WIC enrollment. White and Native American women were more likely to enroll in WIC during their first trimester (49% and 46%) compared with Black (39%), Hispanic (38%) and Asian (30%) women. A significant proportion of Asian (26%) and Hispanic (20%) women did not enroll in WIC until their third trimester. Level of education had little impact on trimester of WIC enrollment. **Table 17** presents data comparing the trimester of first prenatal visit and the trimester of WIC enrollment.

Short Interpregnancy Interval

Women with short interpregnancy intervals (less than 12 months from the birth of one child to conception of the next) are at risk for poor pregnancy outcomes. Overall, 29% of women who had at least one previous birth had a short interpregnancy interval (see State Profile). **Figure 16** shows the percent of women with an interpregnancy interval of less than 12 months for each maternal age group. Only data on women who had a previous birth were included in this graph. **The most striking finding was that 61% of the 750 adolescent women included had short interpregnancy intervals.** Among the 18-24 year old women, 35% had conceived within 12 months of giving birth. A smaller but still significant proportion (16% - 21%) of women 25 years and older had short interpregnancy intervals.

Differences in interpregnancy interval by ethnicity, age and education are presented in **Tables 9 and 10**. The data in these tables were calculated differently from the data in Figure 16. In the tables, all women were included and categorized into three groups: (1) first birth, (2) less than 12 months between pregnancies and (3) more than 12 months between pregnancies. For example, the percent of adolescent women with an interpregnancy interval less than 12 months shown in **Table 9** (9%) represents the percent of all adolescent women who had a short interpregnancy interval, not just the percent of those adolescent women with a previous birth who had a short interpregnancy interval.

Among women of all ages, Asian Americans (18%) were slightly more likely to have a short interpregnancy interval than any other ethnic group (**Table 9**). Also Asian American women 18-24 years of age had the highest rate of short interpregnancy interval (24%) than any age group and race. Women with higher education had slightly lower rates of short interpregnancy interval: 16% vs. 17% (**Table 10**). The ethnic group which showed the largest effect of education were Asian women. Asian women with less than a high school education were much more likely to have a short interpregnancy interval than Asian women with more than 12 years of school (21% vs. 14%).

Maternal Underweight and Overweight

Maternal prepregnancy weight has a strong effect on pregnancy outcome, especially infant birthweight. Women who are underweight before pregnancy are more likely to be anemic, may be undernourished and are more likely to deliver a low birthweight infant ⁽⁵⁾. Overall, 16% of low-income women were underweight prior to pregnancy (**State Profile**). Women who are overweight before pregnancy are more likely to develop gestational diabetes, may also be poorly nourished, and are more likely to deliver a macrosomic infant. Overall, women who were overweight prior to pregnancy comprised 42% of the total group. **Figure 17** shows the proportion of women who were either underweight or overweight before pregnancy for three age groups: (1) less than 18, (2) 18-34 years old, and (3) 35 and over. The prevalence of underweight was highest among young women, and the prevalence of overweight was highest among older women. Among adolescents under age 18, 26% were underweight, and 23% were overweight. **Among women over 35 years old, 8% were underweight and 55% were overweight.**

Asian women and white women were more likely than other ethnic groups to be underweight, while Black women and Native American women were more likely than other ethnic groups to be overweight (**Table 11**). White and Native American adolescents under age 18 had a prevalence of 33% and 26%, respectively, for underweight. For each ethnic group, the prevalence of underweight was greater among young women and the prevalence of overweight was greater among older women. Sixty-four percent of Black women aged 35 and older were overweight prior to pregnancy.

White, Black and Native American women with less than a high school education were all more likely to be underweight than women with a high school education or more (**Table 12**). Among Hispanic and Asian women, education was not strongly related to prevalence of underweight. Prevalence of overweight was higher among more educated women for all ethnic groups except Asians and Hispanics. Asian

women with more than a high school education had a lower prevalence of overweight than those with less than a high school education.

Maternal prepregnancy weight was a strong predictor of incidence of low birthweight (**Figure 13**). Underweight women gave birth to infants who were more likely to be low birthweight (13%) than the infants of overweight women (8%). Maternal prepregnancy underweight and cigarette smoking each had independent effects on the risk of low birthweight (**Table 6**). Infants of underweight smokers had the highest incidence of low birthweight (16%), and infants of overweight non-smokers had the lowest incidence (8%). Infant macrosomia (birthweight greater than 4500 grams) was most prevalent among the overweight group.

Maternal Iron-Deficiency Anemia

Maternal iron-deficiency anemia has negative consequences for maternal health, pregnancy outcome, and adequacy of infant iron stores. Iron-deficiency anemia during the first two trimesters of pregnancy has been associated with inadequate gestational weight gain, a twofold risk for preterm delivery, and a threefold risk for delivering a low-birthweight infant ⁽⁶⁾. The overall prevalence of iron-deficiency anemia among low-income women who gave birth in 1998 was 12% (**State Profile**). **Figure 19** shows that there was little difference in prevalence of anemia by age group, with older pregnant women 35 years of age and older were slightly more likely to be anemic (15%). In contrast, there were strong ethnic differences in prevalence of iron-deficiency anemia (**Figure 20**). **Black women had a prevalence of anemia (19%) which was nearly three times as high as the prevalence among white women (7%),** Native American women (11%), Asian women (12%) and Hispanic women (10%). **Table 18** shows that the higher prevalence of anemia among older women was found only among Black women (19%).

Low Birthweight

Low birthweight (<2,500 grams or 5.5 lbs) is the single most important factor affecting neonatal mortality and is a determinant of postneonatal mortality ⁽⁷⁾. Low birthweight and prematurity are the leading precursors of infant mortality in North Carolina. Infants weighing 2,500 grams or less are almost 40 times more likely to die during their first month of life than are infants of normal birthweight. In addition, infants with low birthweight are more likely to experience developmental delays and disabilities than infants with normal birthweight ⁽⁸⁾. The birthweight distribution of infants born in 1998 to low-income women is presented in **Figure 10**. Overall, 10% of these infants weighed less than 2500 grams at birth. In addition, 1% of these infants weighed more than 4500 grams at birth. High birthweight, or *macrosomia*, is also associated with higher rates of infant mortality.

The incidence of low birthweight was highest among infants of women aged 35 years and older (15%), as shown in **Figure 11**. Women aged 30-34 years old had the next highest incidence of low birthweight (12%). **Figure 12** shows incidence of low birthweight for each maternal ethnic group. The lowest rates of low birthweight were found among infants of Hispanic (6%), Asian (7%) and White (8%) women. Infants of Black women had the highest rate of low birthweight (13%). The low birthweight rates for infants of Native American women was 11%. **Table 5** shows that women with less than a high school education were more likely to give birth to a low birthweight infant than women with at least 12 years of school. White women and also women 25 years and older had the highest incidence of high birthweight (2%), as shown in **Table 5**.

As described above, both maternal cigarette smoking and prepregnancy underweight were strong predictors of low birthweight. Underweight women gave birth to infants who were about two-thirds more likely to be low birthweight (13%) than the infants of overweight women (8%) (**Figure 13**). Women who smoked cigarettes during pregnancy were also more likely to give birth to a low birthweight baby compared with non-smokers (13% vs. 9%), as shown in **Figure 14**. Infants of underweight smokers

had the highest incidence of low birthweight (16%), and infants of overweight non-smokers had the lowest incidence of low birthweight (8%) (**Figure 15**).

Breastfeeding

The prevalence of breastfeeding among low-income women in North Carolina at the time of their postpartum WIC visit has been increasing steadily since 1991. It increased from 27% in 1996 to 31% in 1998, as shown in the State Profile. There was significant variation in prevalence of breastfeeding by ethnicity, age and education. **Table 7** presents data on the prevalence of breastfeeding at the WIC postpartum visit by maternal ethnicity and age. The breastfeeding rate was 31% among white women, 22% among black women, 26% among Native American women and 35% among Asian women. The highest breastfeeding rate was among the Hispanic women (61%). Older women were more likely to breastfeed than younger women. Adolescents under age 18 had a very low rate of breastfeeding (20%). Overall, the highest prevalence of breastfeeding was among women 35 years and older (38%).

As shown in **Table 8**, women with more than 12 years of education were much more likely to breastfeed than women who had not completed high school (43% vs. 25%). Among Black women, those with less than a high school education had a breastfeeding prevalence of only 13%, while those with more than a high school education were more than three times as likely to breastfeed (36%). The difference in breastfeeding among the education groups was also pronounced among white women. White women with more than 12-years of education were over twice as likely to breastfeed than white women with less than a high school education (47% vs. 21%). The effect of education on breastfeeding was least noticed among the Hispanics (61% vs. 64%). The higher breastfeeding rates in Hispanics could probably be attributed to their culture norm.

Discussion and Recommendations

Nutrition surveillance data is most useful for describing the needs or problems of the target population. Surveillance data, because it is collected continuously in the same format is particularly useful for outcome evaluation. Maternal health behaviors, including nutrition practices contribute to pregnancy outcome and maternal and infant well being. Nutrition-related factors that affect maternal and infant health include quality of maternal diet, prepregnancy weight, weight gain during pregnancy, anemia, and infant-feeding method. Other influential behavioral factors include alcohol use, tobacco use, and time of entry to prenatal care. The findings of this report on the nutritional and health status of low-income pregnant women in North Carolina during 1998 reflect both the successes of past public health efforts and the urgency of continued public health prevention efforts in several areas. Many of the problem areas identified in this report will not be overcome without a state-wide commitment to provide, in addition to medical care, the economic and social support poor families need to be able to improve their standard of living and their health.

One way to reduce the incidence of low birthweight is to identify women at risk of bearing low-birthweight infants and provide these women with preventive and therapeutic services. Factors associated with low birthweight include sociodemographic characteristics such as race or ethnicity, age, marital status, and income, as well as nutritional and behavioral factors such as weight gain, smoking, and alcohol consumption ⁽⁹⁾.

The reported prevalence of cigarette use among low-income pregnant women remained almost unchanged since 1991. Prevalence of smoking rates are still very high, especially among white women and women with less than a high school education. Cigarette smoking is one of the most significant risk factors for low birthweight, and cessation of smoking at any point during pregnancy has a positive

impact on maternal well-being and infant birthweight. Low-income pregnant women should be provided with health education about the toxic effects of cigarette smoke on the developing infant, and about methods of smoking cessation which have proven to be effective. Support for smoking cessation should be provided by all health professionals.

About 16% of low-income pregnant women in North Carolina were underweight before pregnancy and about 42% were overweight before pregnancy in 1998. Prevalence of overweight in pregnant women has increased since 1991. The prevention of these problems necessitates a long-term community-wide approach. Health education efforts to modify individual eating behaviors must be accompanied by community efforts to improve the availability and affordability of healthy nutritious foods in neighborhood stores, schools and workplaces. Preconception nutrition care should be integrated into primary care, to address prepregnancy nutritional risks such as underweight, obesity, and anemia.

The importance of lifetime physical fitness activity in maintaining a healthy weight should also be promoted by community, school, workplace and health education efforts. Nutrition counseling for pregnant women should emphasize the benefits of regular, appropriate exercise. Low-income women who were underweight before pregnancy must be strongly encouraged to gain adequate weight during pregnancy to lower their risk of delivering a low birthweight infant. Innovative strategies should be implemented to reverse the rising trend of overweight among women, including the prevention of overweight before reproductive age and the reduction of postpartum weight retention among overweight women.

Efforts to improve access to prenatal care and WIC program benefits for low-income pregnant women are reflected in the lower rates of inadequate prenatal care and late WIC enrollment seen for 1998, compared with the preceding years. However, much progress still needs to be made to reach the goal of having all eligible women receiving prenatal care and WIC benefits in the first trimester. Community outreach

efforts should be made to inform eligible pregnant women of the services available to them.

Special breastfeeding promotion efforts across the state, many funded by the WIC program, have contributed to the increase in the prevalence of breastfeeding at the WIC postpartum visit from 17% in 1991 to 31% in 1998. Most low-income women are aware of the benefits of breastfeeding, but they are less likely to breastfeed because of cultural norms, lack of social support, few role models, and economic barriers which include early return to work or school. Community-wide changes in school and workplace policies, and the knowledge and attitudes of mothers, families and health professionals will be necessary to make breastfeeding the best choice for all mothers.

The urgent need for expanded family planning services for low-income women is illustrated by several findings from this report. First, 5,170 low-income pregnant women were under the age of 18 when they delivered in 1998. This represented about 10% of all low-income births. Adolescent pregnancies are often unplanned and mistimed. In addition, a short interpregnancy interval among women of all ages who had a previous birth was very common. A short interpregnancy interval can result in a serious drain not only on maternal nutrition and health, but also on family economic resources.

The educational status of women in North Carolina is a vital key to improving maternal and child health. Thirty-five percent of low-income pregnant women in 1998 had less than a high school education. That is an improvement over the 40% observed six years ago. Inadequate education was associated with higher levels of most risk factors presented in this report. Women with more education smoked less, had higher birthweight babies and were more likely to breastfeed. However, despite the importance of education for low-income women, poverty itself continues to be the most damaging and intractable risk factor for poor maternal and infant health in North Carolina. Low-income pregnant women represented about 42% of all women who gave birth statewide in 1998. The direct effects of poverty on the nutritional status of women and children have been well-documented. In addition to lack of reliable and sufficient economic resources to purchase nutritious food for their families, poor women also must

often contend with poor availability of nutritious food in nearby community stores and lack of transportation to reach other neighborhoods or towns. Communities which provide women with both education and economic opportunity will be rewarded with fewer poor families and healthier mothers and children.

Methods and Definitions

The Pregnancy Nutrition Surveillance System (PNSS) collects pregnancy risk factor and outcome data on low-income North Carolina women. Data is collected through three sources: the WIC automated data processing system, the Health Services Information System (HSIS), which provides data from public maternal health clinics, and infant birth certificates or fetal death reports. Records for pregnant women from each of these three sources are linked together to provide a complete picture of pregnancy risk factors and infant outcomes for each woman. An explanation of the definitions and data sources for all of the risk factors and outcomes presented in this report appears below.

- Age:** Each woman's age at the time of delivery.
Source: Birth certificate/fetal death report
- Marital status:** Whether each woman was married at the time of delivery.
Source: Birth certificate/fetal death report
- Education:** Number of years of school each woman had completed at the time of Delivery.
Source: Birth certificate/fetal death report
- Ethnicity:** Woman's race or ethnic background.
Source: WIC system/birth certificate/fetal death report
- Parity:** Number of previous live births each woman had had.
Source: Birth certificate/fetal death report
- Interpregnancy Interval:** Number of months between delivery of the previous pregnancy and conception of the current pregnancy. Short interpregnancy interval was defined as less than 12 months.
Source: Birth certificate/fetal death report
- Smoking:** Women who smoked at least one cigarette per day during their pregnancy were considered smokers.
Source: WIC system/birth certificate/fetal death report

Prepregnancy Weight:	A body mass index (BMI) figure for each woman was calculated based on prepregnancy weight and height. Each woman's BMI was compared to the definitions provided in the 1990 Institute of Medicine report on <u>Weight Gain During Pregnancy</u> to determine if she was underweight, normal weight or overweight. Source: WIC system/HSIS system
Iron-Deficiency Anemia:	Each woman's hematocrit or hemoglobin measurement from her prenatal WIC certification visit was compared to the definitions established by the Centers for Disease Control to determine if she was anemic. The definitions are specific for trimester of measurement and number of cigarettes smoked per day. <u>Source:</u> WIC system/HSIS system
Adequacy of Prenatal Care:	The trimester of first prenatal visit and the total number of prenatal care visits were used to classify the care that each woman received as adequate, intermediate or inadequate, based on the Kessner Index. <u>Source:</u> Birth certificate/fetal death report
Trimester of WIC Enrollment:	The WIC action date for prenatal WIC certification was used to calculate the trimester of WIC enrollment for each woman who participated in WIC during her pregnancy. <u>Source:</u> WIC system/birth certificate/fetal death report
Apgar score:	Apgar score represents an assessment of the newborn's clinical condition. The score is based on heart rate, respiratory effort, muscle tone, reflex irritability, and color. Scores can range from 0 to 10. Low five-minute Apgar score was defined as a value less than 7. Data was presented for live births only. <u>Source:</u> Birth certificate
Breastfeeding:	Whether each woman was currently breastfeeding was determined at the postpartum WIC certification visit. The timing of this visit varies for each woman; the usual time is six weeks postpartum. This data is only available for women who were enrolled in WIC during the postpartum period. <u>Source:</u> WIC system

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**FIGURES
AND
TABLES**

Figure 1
**Demographic Background
North Carolina
Pregnancy Nutrition Surveillance 1998**

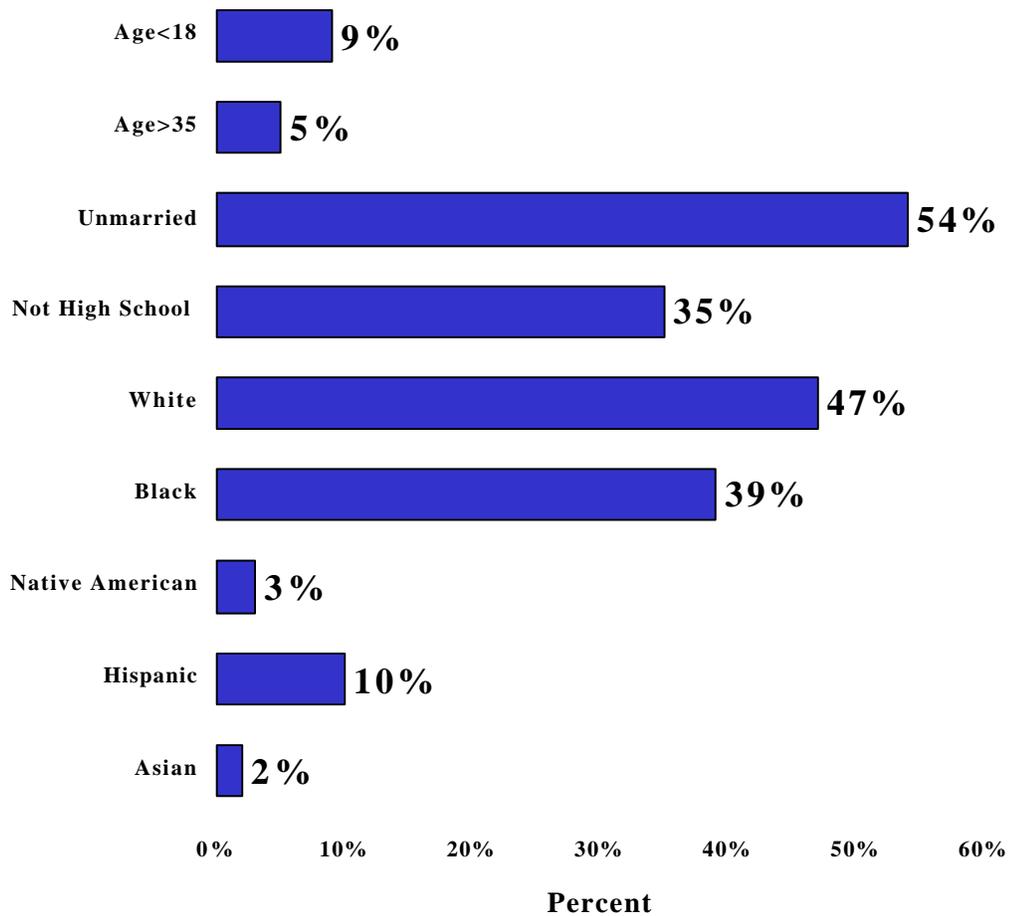


Figure 2
Pregnancy History
North Carolina
Pregnancy Nutrition Surveillance 1998

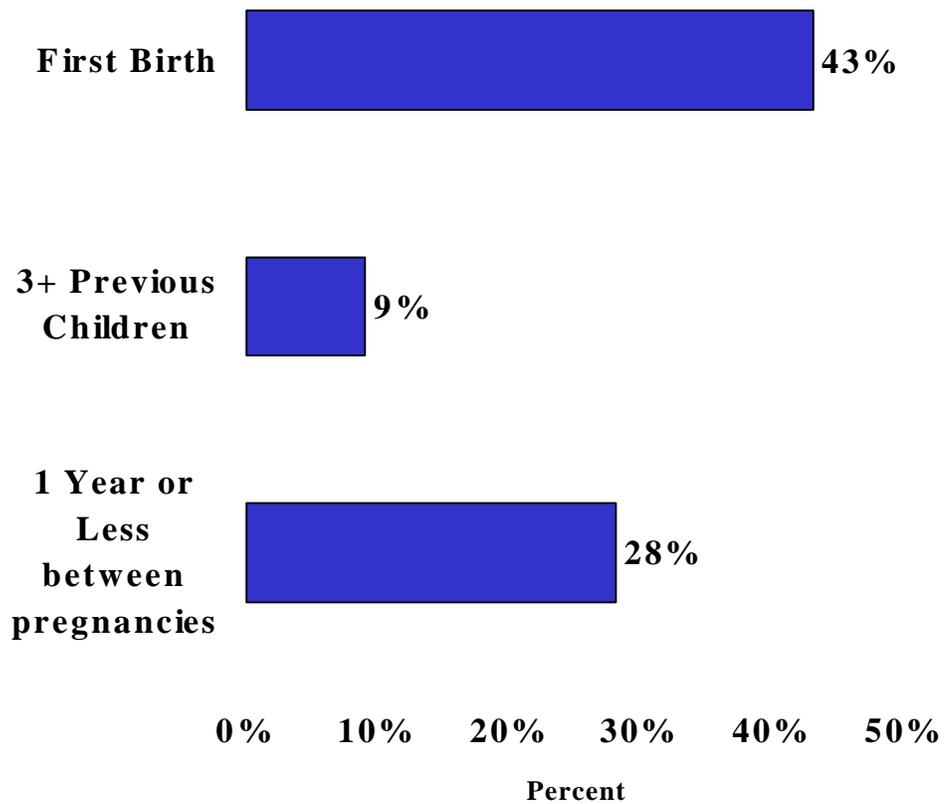
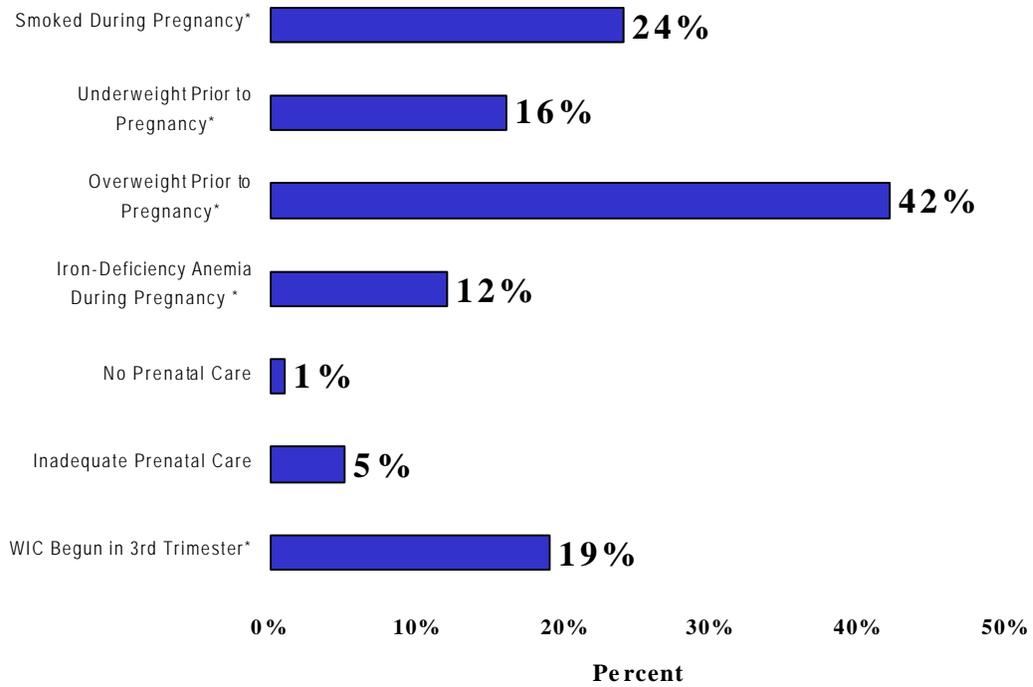
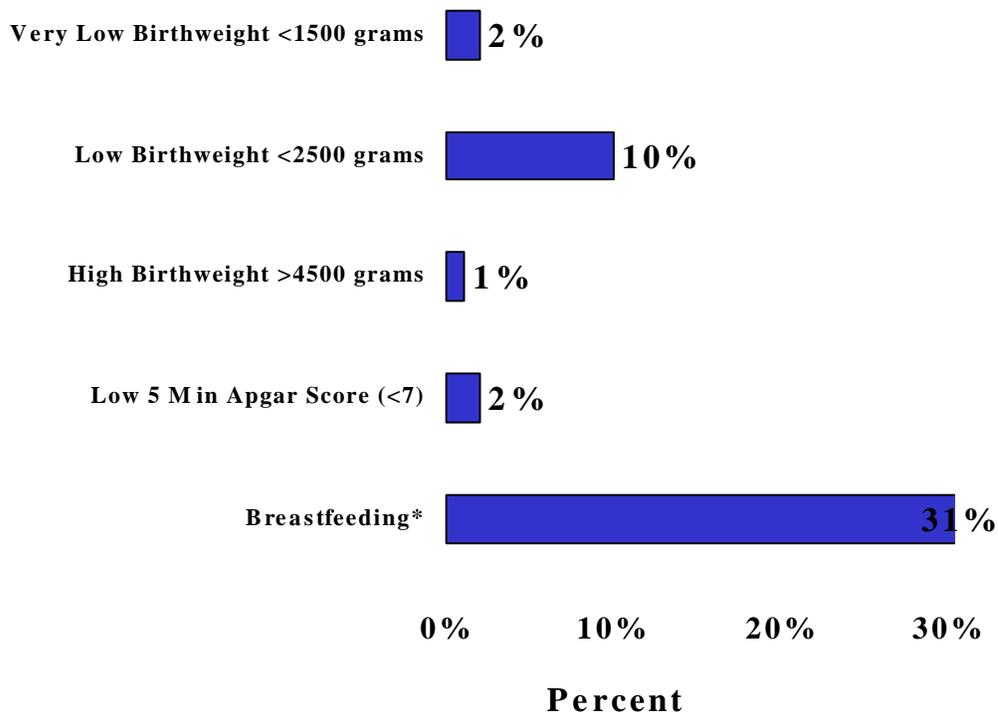


Figure 3
Nutrition and Health Care Profile
North Carolina
Pregnancy Nutrition Surveillance 1998



*Includes only mothers enrolled in WIC

Figure 4
**Pregnancy Outcome Profile
North Carolina
Pregnancy Nutrition Surveillance 1998**



*Includes only mothers enrolled in WIC

Figure 5
**Percent of Mothers Who Smoked During
Pregnancy For Each Maternal Age Group
North Carolina
Pregnancy Nutrition Surveillance 1998**

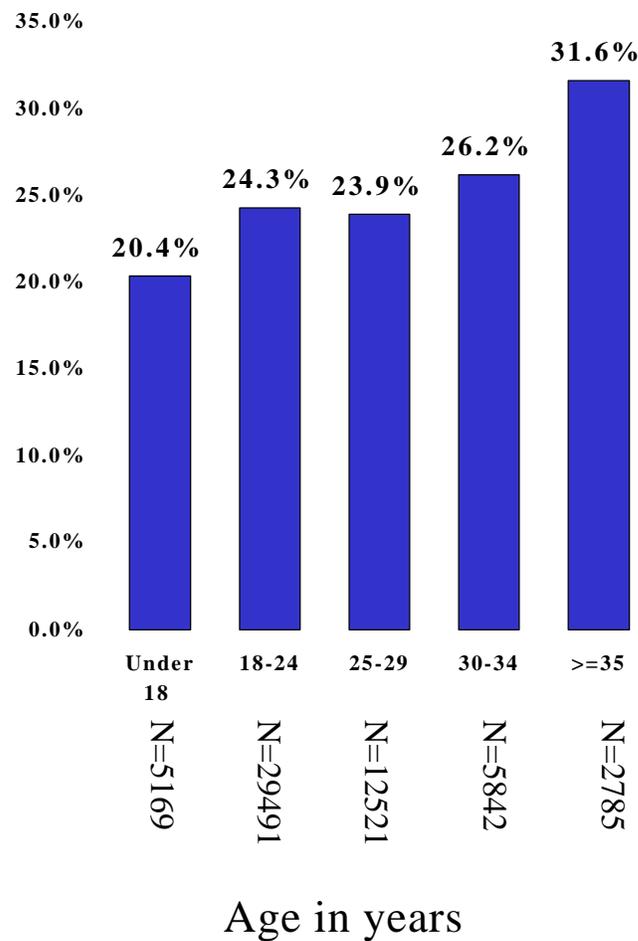


Figure 6
**Percent of Mothers Who Smoked During
Pregnancy For Each Maternal Ethnic Group
North Carolina
Pregnancy Nutrition Surveillance 1998**

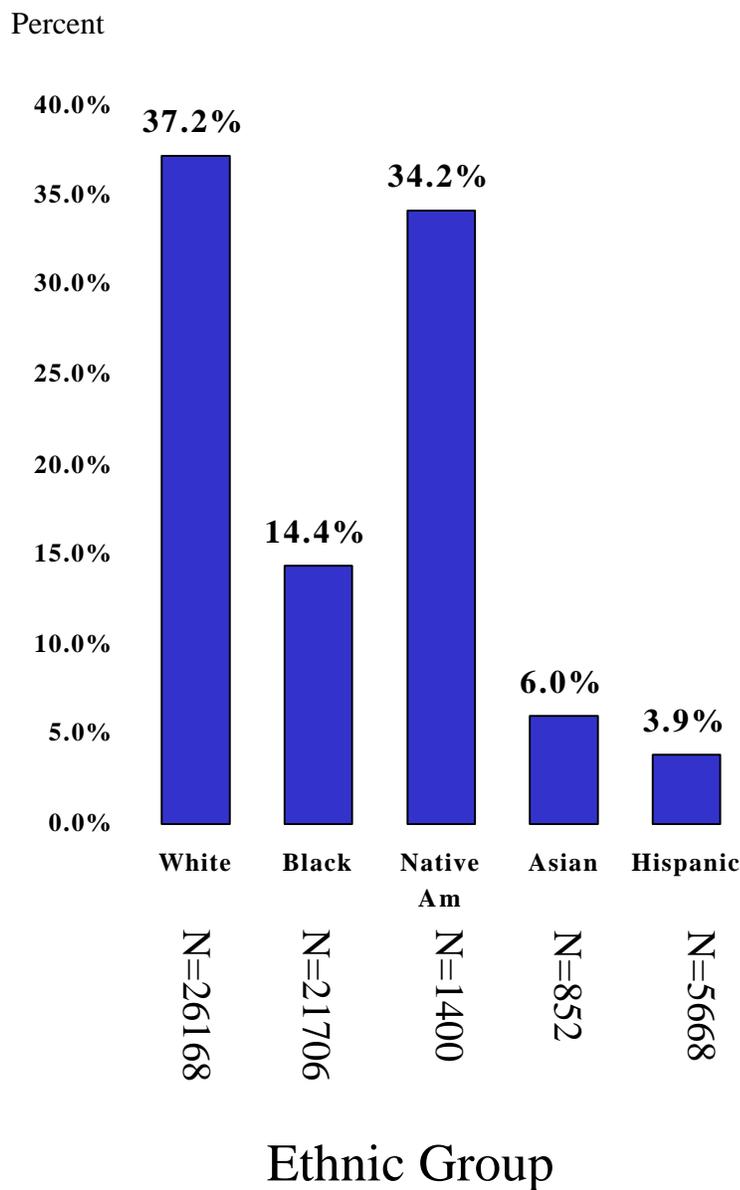


Figure 7
Percent of Mothers Who Smoked During
Pregnancy For Each Maternal Education Group
North Carolina
Pregnancy Nutrition Surveillance 1998

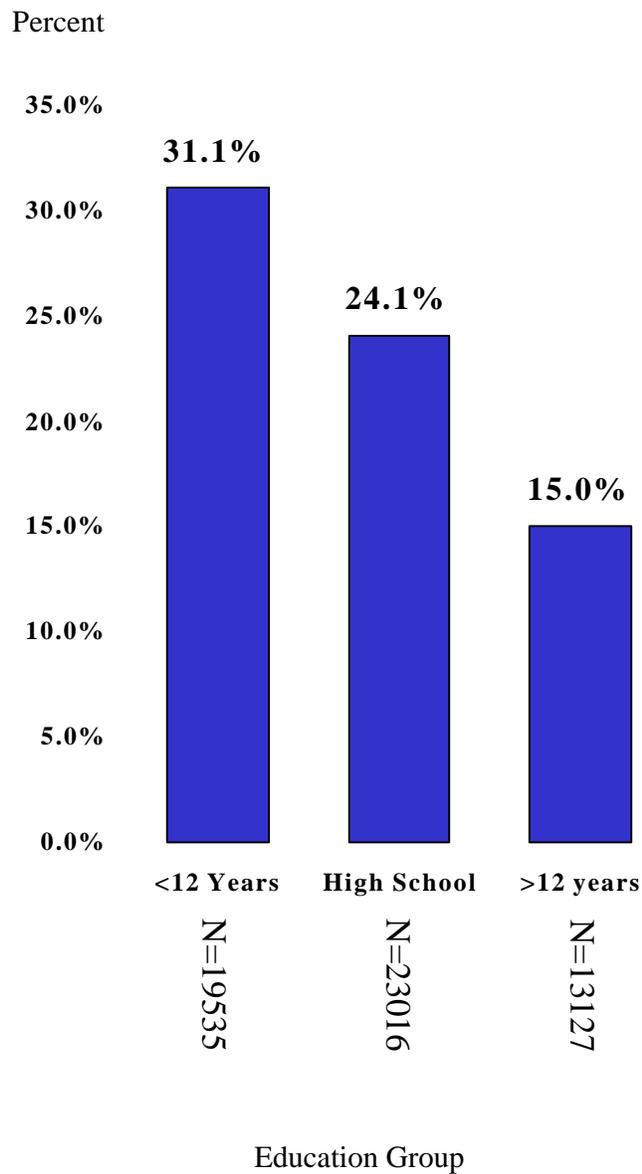
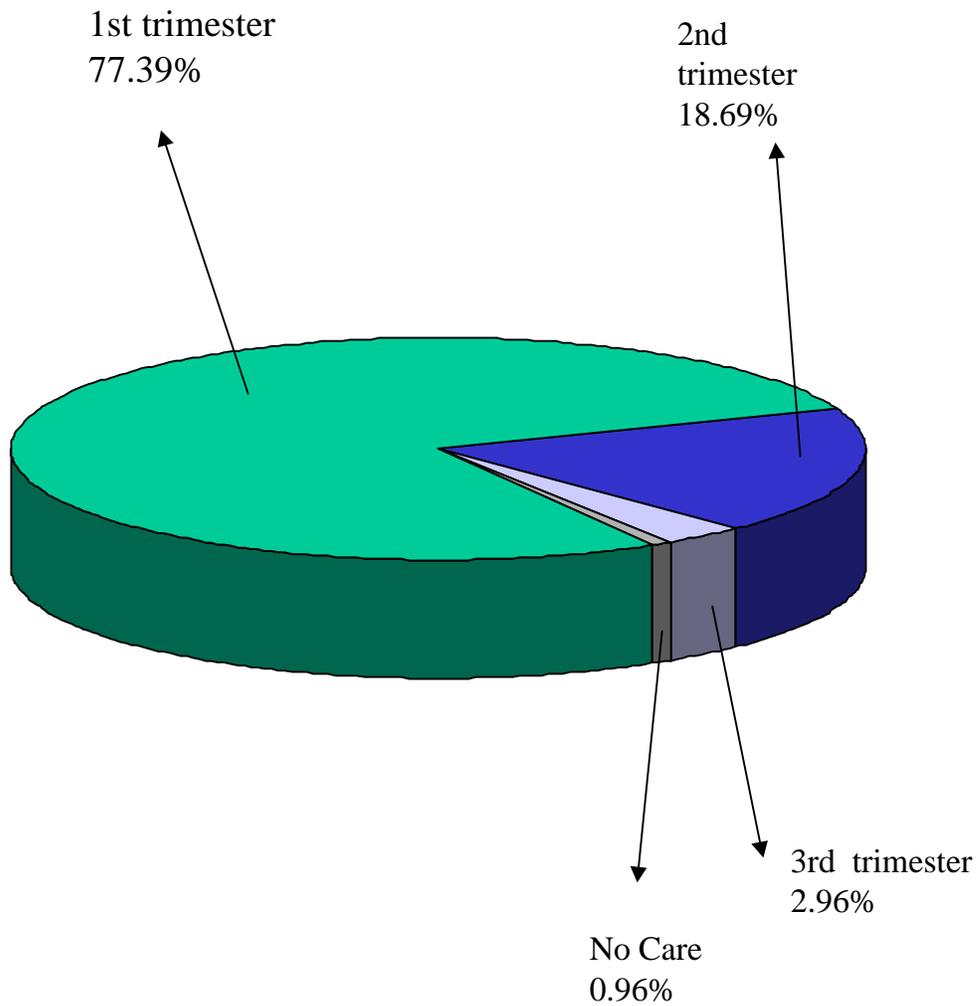
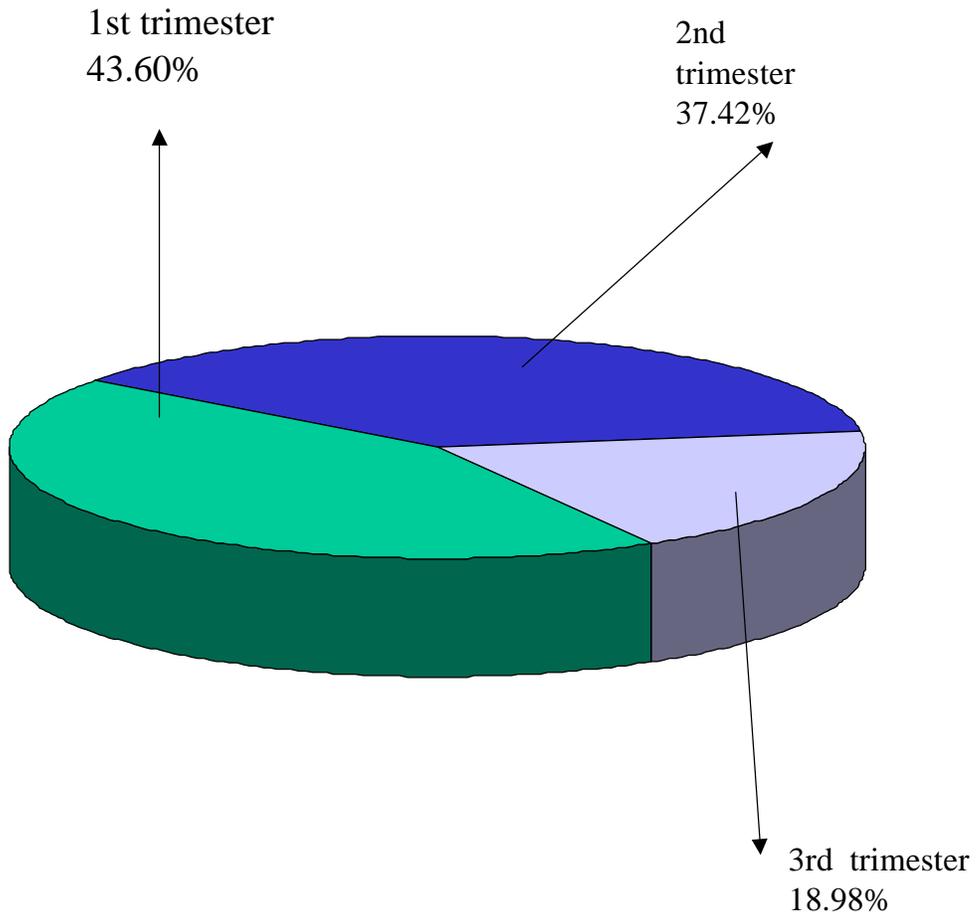


Figure 8
Trimester of First Prenatal Visit
North Carolina
Pregnancy Nutrition Surveillance 1998



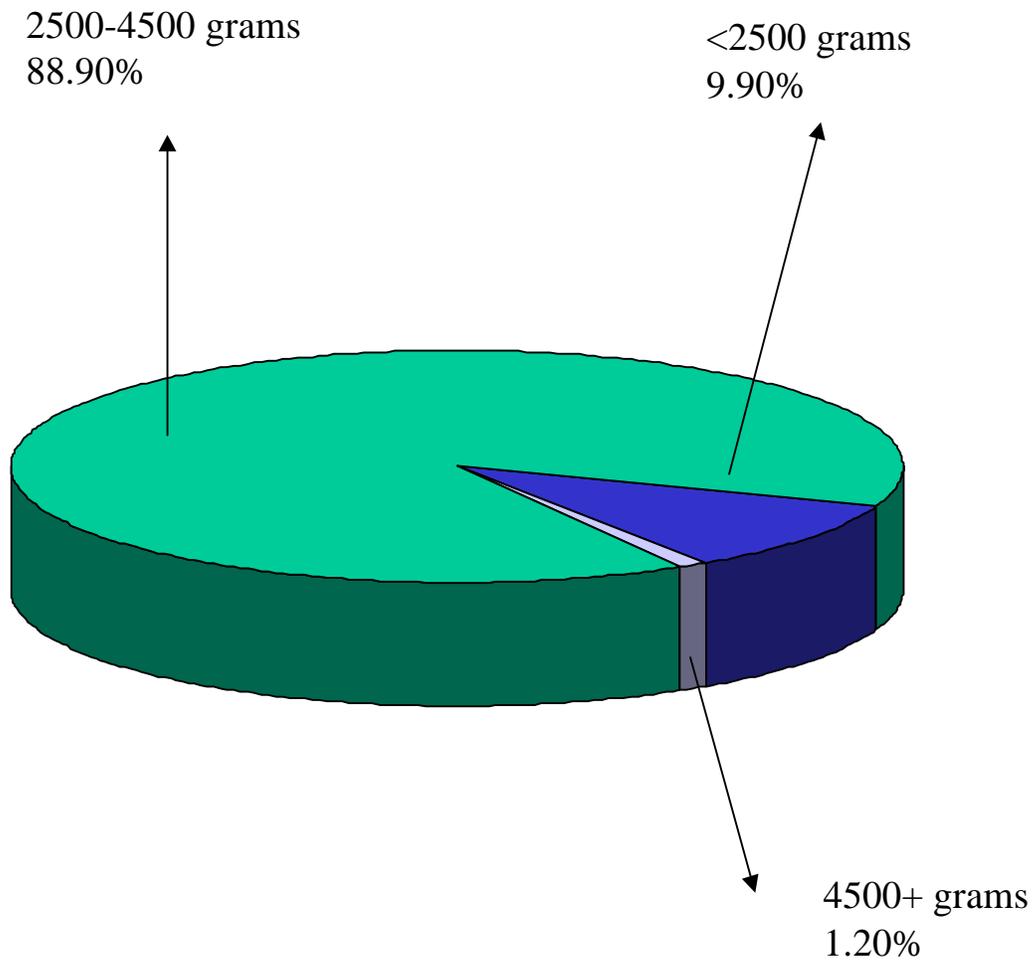
55429 records

Figure 9
Trimester of WIC Certification
North Carolina
Pregnancy Nutrition Surveillance 1998



44213 records

Figure 10
Distribution of Infant Birthweights
North Carolina
Pregnancy Nutrition Surveillance 1998



55507 records

Figure 11
**Percent of Infants With Low Birthweight
 For Each Maternal Age Group
 North Carolina
 Pregnancy Nutrition Surveillance 1998**

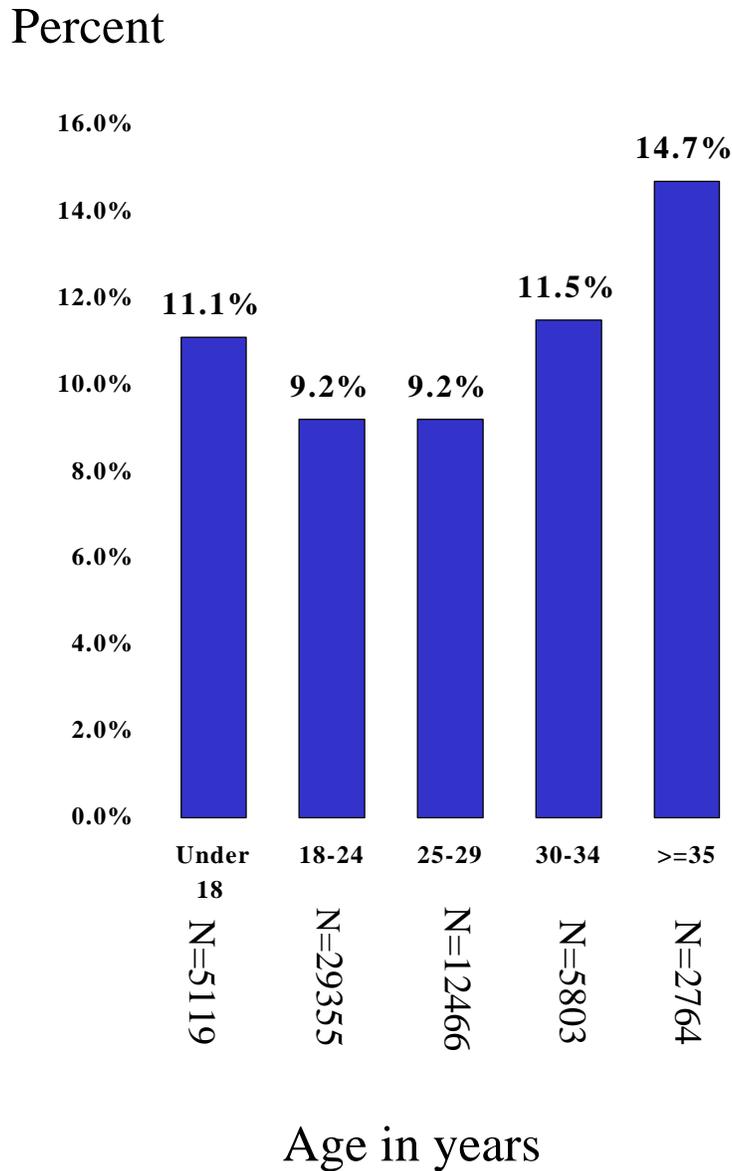
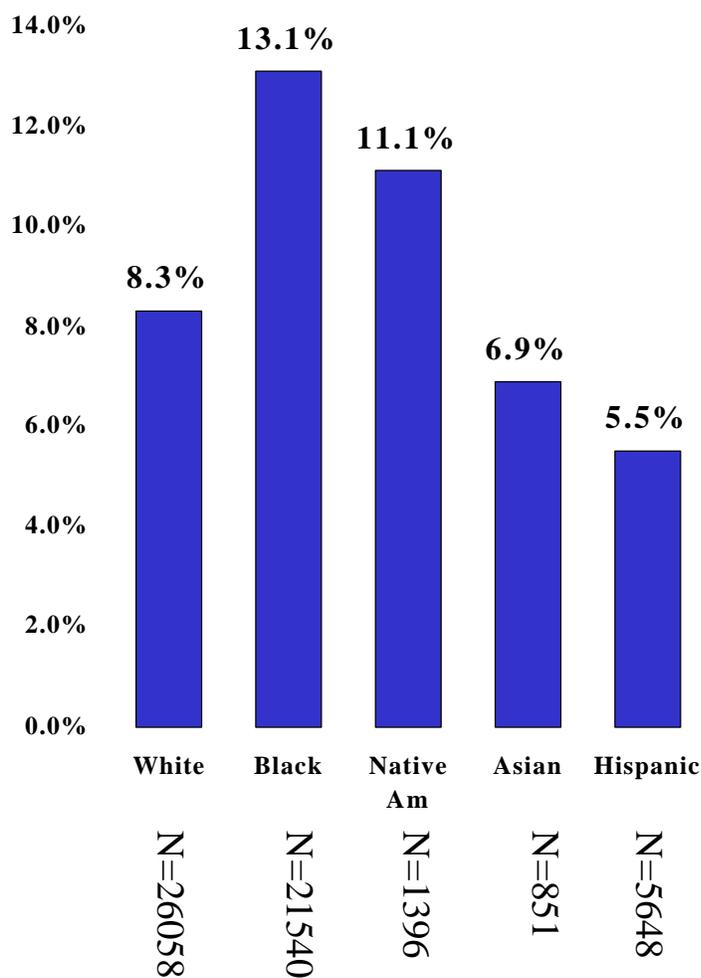


Figure 12
**Percent of Infants With Low Birthweight
For Each Maternal Ethnic Group
North Carolina
Pregnancy Nutrition Surveillance 1998**

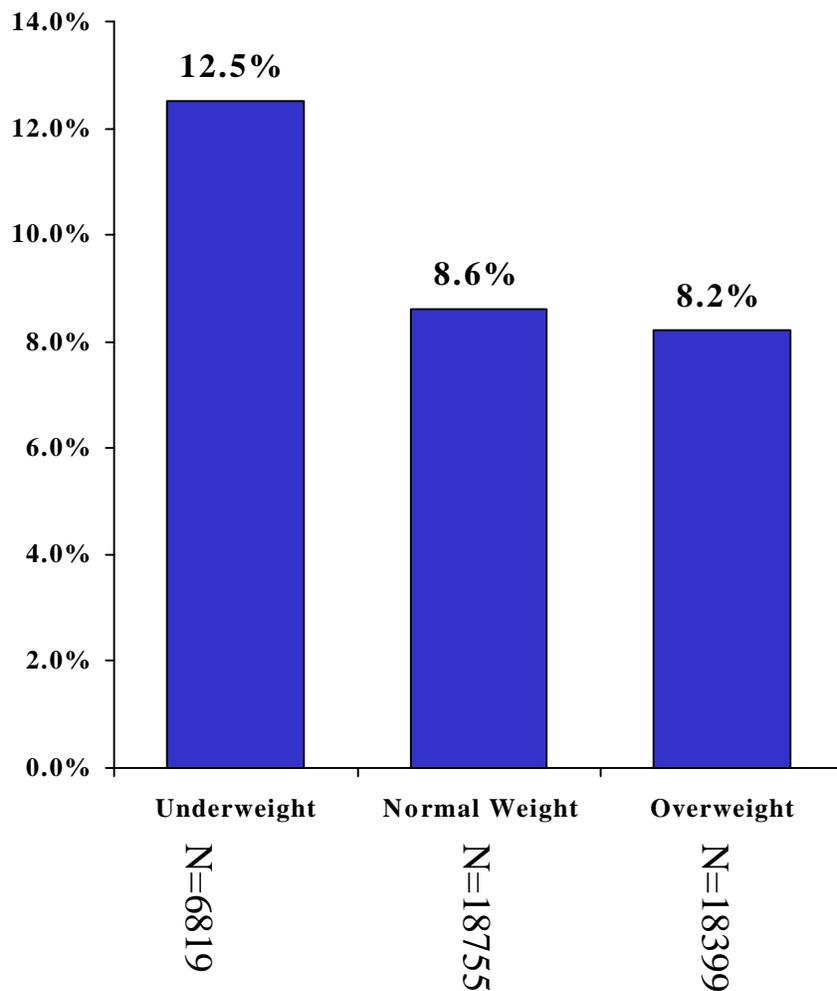
Percent



Ethnic Group

Figure 13
**Percent of Infants With Low Birthweight
 For Each Maternal Prepregnancy Weight Group ***
North Carolina
Pregnancy Nutrition Surveillance 1998

Percent



*Includes only mothers enrolled in WIC

Figure 14
**Percent of Infants With Low Birthweight
By Maternal Smoking During Pregnancy
North Carolina
Pregnancy Nutrition Surveillance 1998**

Percent

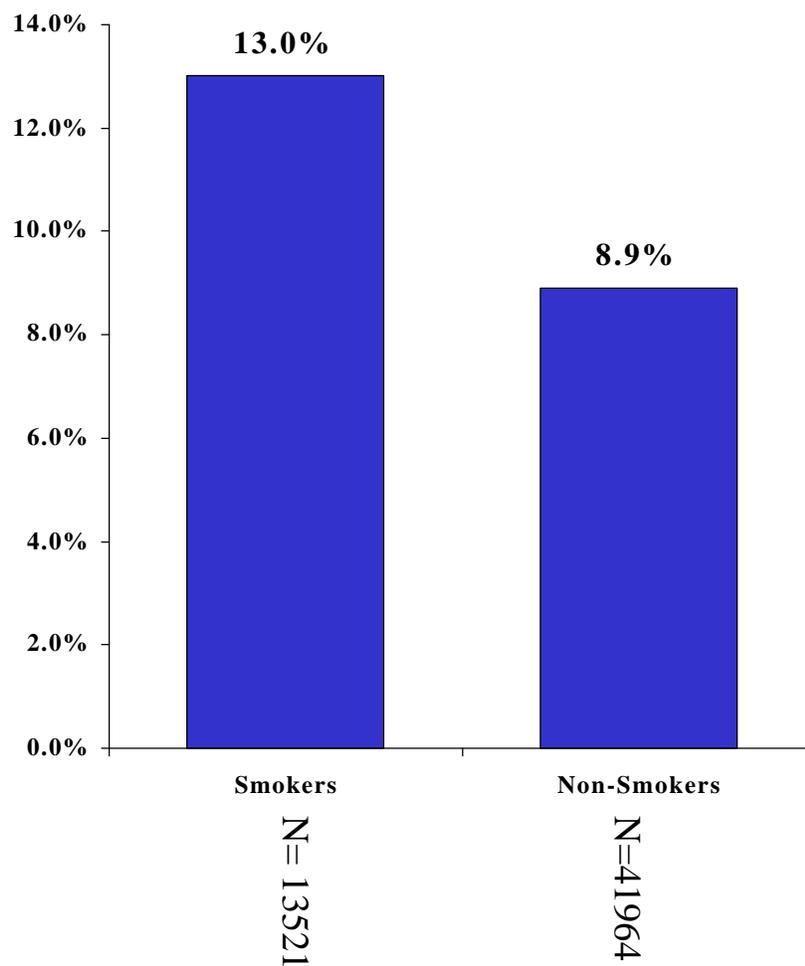
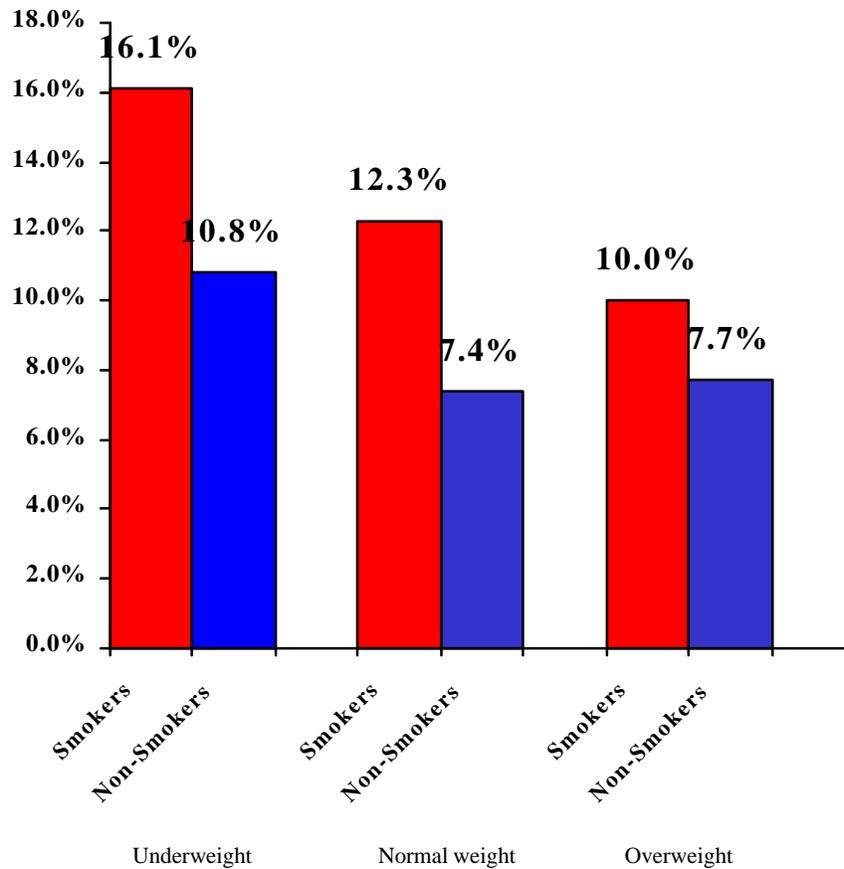


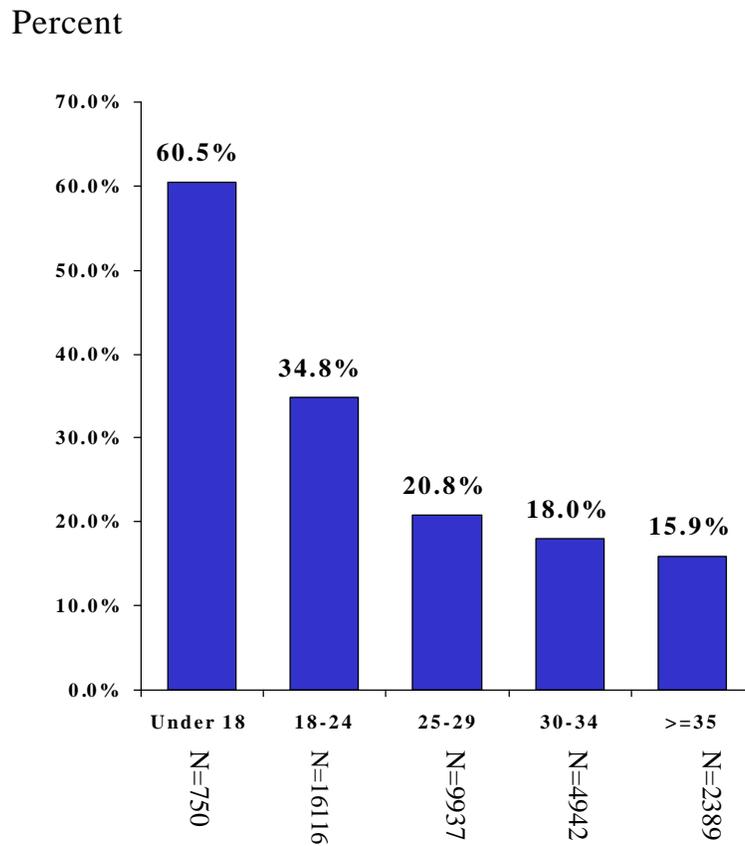
Figure 15
**Percent of Infants With Low Birthweight
 For Each Maternal Prepregnancy Weight and
 Smoking During Pregnancy ***
North Carolina
Pregnancy Nutrition Surveillance 1998

Percent



*Includes only mothers enrolled in WIC

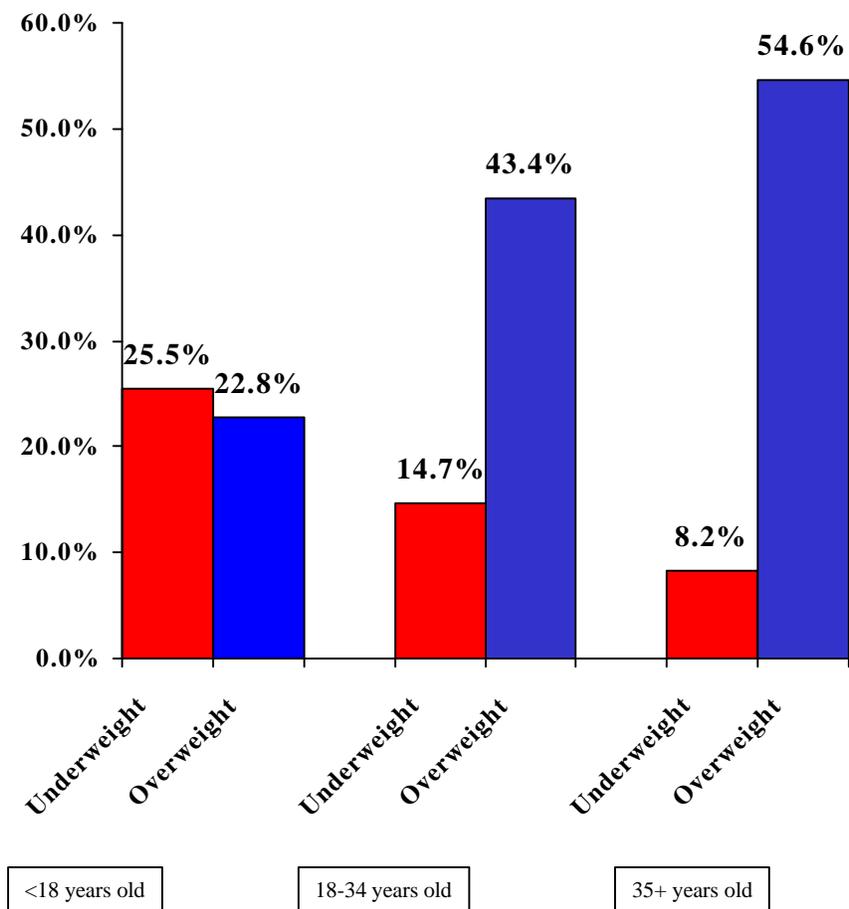
Figure 16
**Percent of Mothers With Interpregnancy Interval *
 less than 12 Months For Each Maternal Age Group
 North Carolina
 Pregnancy Nutrition Surveillance 1998**



*Includes only mothers with atleast one previous pregnancy

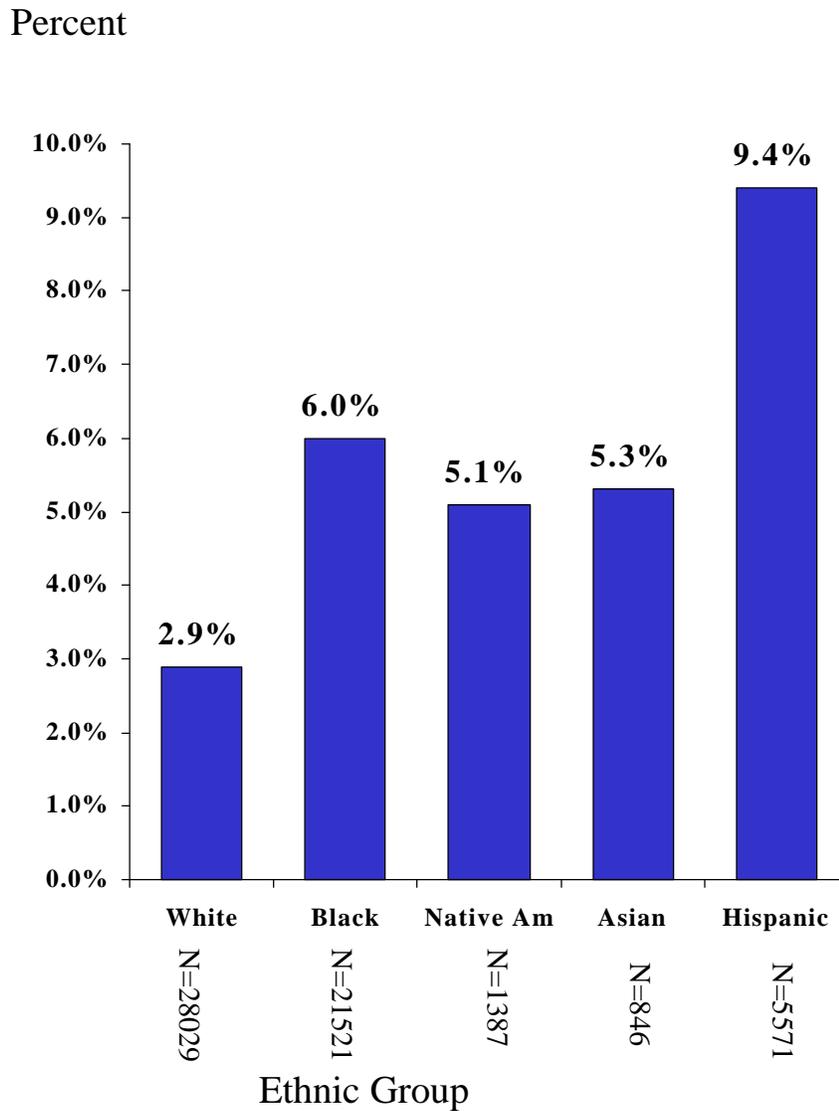
Figure 17
**Percent of Women who were Underweight or
 Overweight Before Pregnancy * by Age
 North Carolina
 Pregnancy Nutrition Surveillance 1998**

Percent



* Based on self-reported weight and height

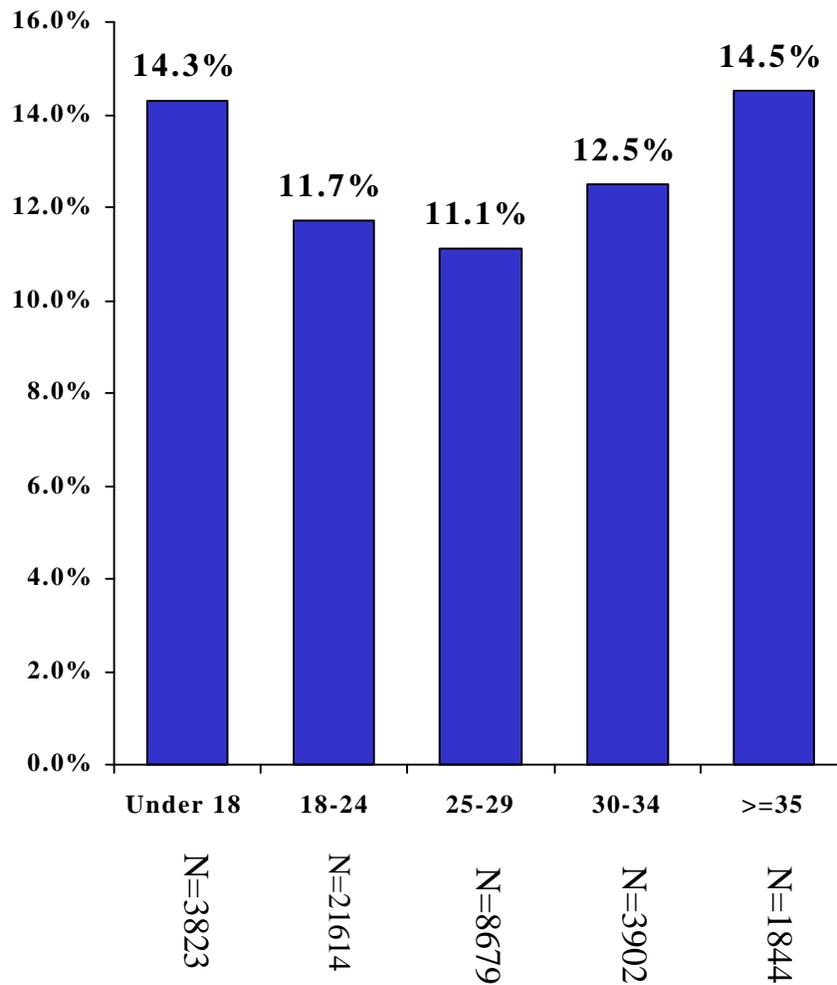
Figure 18
Percent of Infants With Inadequate Prenatal Care*
For Each Maternal Ethnic Group
North Carolina
Pregnancy Nutrition Surveillance 1998



* Based on Kessner Index of adequacy of prenatal care.

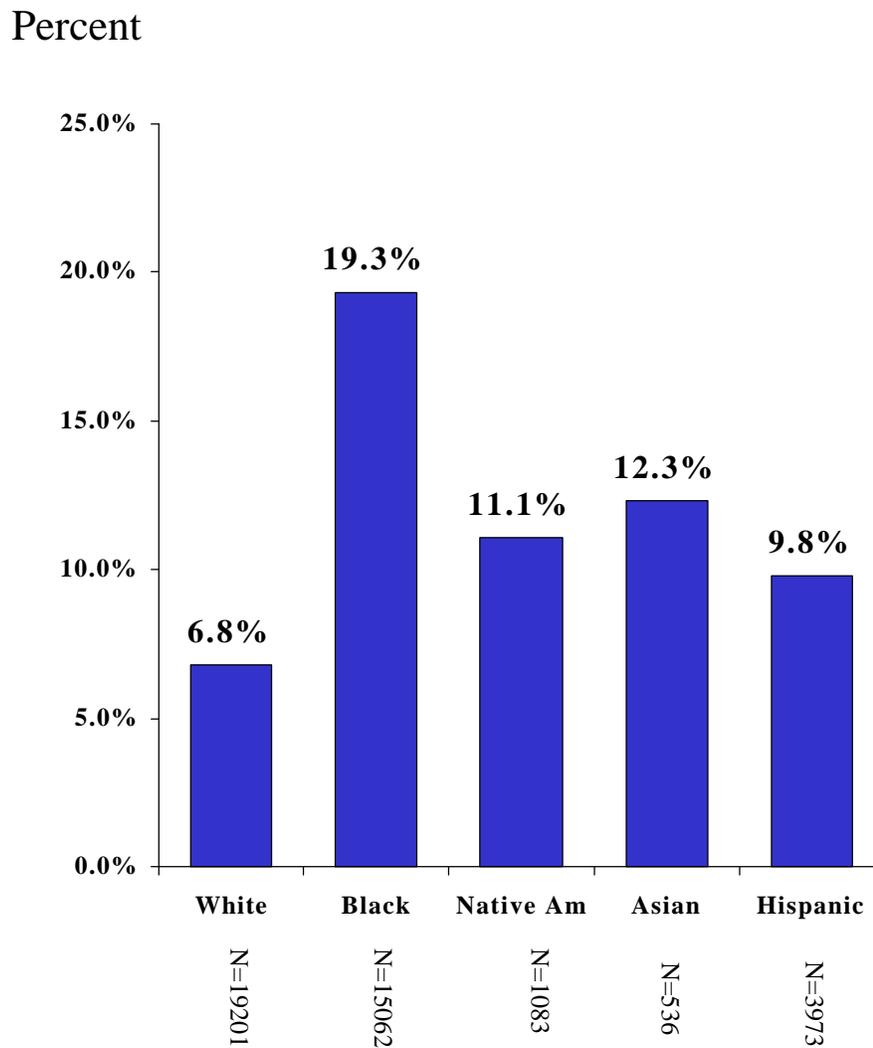
Figure 19
Percent of Mothers With Iron-Deficiency Anemia *
For Each Maternal Age Group
North Carolina
Pregnancy Nutrition Surveillance 1998

Percent



*Includes only mothers enrolled in WIC

Figure 20
Percent of Mothers With Iron-Deficiency Anemia *
For Each Maternal Ethnic Group
North Carolina
Pregnancy Nutrition Surveillance 1998



*Includes only mothers enrolled in WIC

Table 1
 Maternal Smoking During Pregnancy
 By Ethnicity and Age
 North Carolina
 Pregnancy Nutrition Surveillance System 1998

ETHNICITY BY AGE		SMOKING					
		Smokers		Non-smokers		<<TOTAL>>	
		Count	%	Count	%	Count	%
White	<18 years	796	37	1375	63	2171	100
	18-24 years	5308	37	8978	63	14286	100
	25-29 years	2150	36	3812	64	5962	100
	30-34 years	957	38	1571	62	2528	100
	35 + years	520	43	701	57	1221	100
	<SUBTOTAL>	9731	37	16437	63	26168	100
Black	<18 years	186	8	2167	92	2353	100
	18-24 years	1443	13	9823	87	11266	100
	25-29 years	688	15	3860	85	4548	100
	30-34 years	498	21	1856	79	2354	100
	35 + years	318	27	867	73	1185	100
	<SUBTOTAL>	3133	14	18573	86	21706	100
Native American	<18 years	45	28	116	72	161	100
	18-24 years	266	34	507	66	773	100
	25-29 years	93	34	180	66	273	100
	30-34 years	50	37	85	63	135	100
	35 + years	25	43	33	57	58	100
	<SUBTOTAL>	479	34	921	66	1400	100
Asian	<18 years	2	3	70	97	72	100
	18-24 years	24	7	333	93	357	100
	25-29 years	15	7	206	93	221	100

(CONTINUED)

Table 1
Maternal Smoking During Pregnancy
By Ethnicity and Age
North Carolina
Pregnancy Nutrition Surveillance System 1998

ETHNICITY BY AGE		SMOKING					
		Smokers		Non-smokers		<<TOTAL>>	
		Count	%	Count	%	Count	%
Asian	30-34 years	5	4	127	96	132	100
	35 + years	5	7	65	93	70	100
	<SUBTOTAL>	51	6	801	94	852	100
Hispanic	<18 years	23	6	388	94	411	100
	18-24 years	113	4	2689	96	2802	100
	25-29 years	51	3	1464	97	1515	100
	30-34 years	23	3	666	97	689	100
	35 + years	13	5	238	95	251	100
	<SUBTOTAL>	223	4	5445	96	5668	100
All Races	<18 years	1052	20	4116	80	5168	100
	18-24 years	7154	24	22330	76	29484	100
	25-29 years	2997	24	9522	76	12519	100
	30-34 years	1533	26	4305	74	5838	100
	35 + years	881	32	1904	68	2785	100
	<SUBTOTAL>	13617	24	42177	76	55794	100

Table 2
 Maternal Smoking During Pregnancy
 By Ethnicity and Education
 North Carolina
 Pregnancy Nutrition Surveillance System 1995

ETHNICITY BY EDUCATION		SMOKING					
		Smokers		Non-smokers		<<TOTAL>>	
		Count	%	Count	%	Count	%
White	<12 years	4340	51	4210	49	8550	100
	High School Graduate	4005	35	7460	65	11465	100
	>12 years	1372	22	4754	78	6126	100
	<SUBTOTAL>	9717	37	16424	63	26141	100
Black	<12 years	1382	21	5073	79	6455	100
	High School Graduate	1260	13	8112	87	9372	100
	>12 years	483	8	5363	92	5846	100
	<SUBTOTAL>	3125	14	18548	86	21673	100
Native American	<12 years	229	42	322	58	551	100
	High School Graduate	190	33	384	67	574	100
	>12 years	60	22	212	78	272	100
	<SUBTOTAL>	479	34	918	66	1397	100
Asian	<12 years	18	6	259	94	277	100
	High School Graduate	21	6	320	94	341	100
	>12 years	12	5	214	95	226	100
	<SUBTOTAL>	51	6	793	94	844	100
Hispanic	<12 years	114	3	3584	97	3698	100
	High School Graduate	64	5	1196	95	1260	100
	>12 years	45	7	607	93	652	100

(CONTINUED)

Table 2

Maternal Smoking During Pregnancy
By Ethnicity and Education
North Carolina
Pregnancy Nutrition Surveillance System 1995

ETHNICITY BY EDUCATION		SMOKING					
		Smokers		Non-smokers		<<TOTAL>>	
		Count	%	Count	%	Count	%
Hispanic	<SUBTOTAL>	223	4	5387	96	5610	100
All Races	<12 years	6083	31	13448	69	19531	100
	High School Graduate	5540	24	17472	76	23012	100
	>12 years	1972	15	11150	85	13122	100
	<SUBTOTAL>	13595	24	42070	76	55665	100

Table 3
 Trimester of First Prenatal Visit
 by Maternal Age, Ethnicity, and Education
 North Carolina
 Pregnancy Nutrition Surveillance System 1998

	TRIMESTER OF FIRST PRENATAL VISIT							
	1st Trimester		2nd Trimester		3rd Trimester		<<TOTAL>>	
	Count	%	Count	%	Count	%	Count	%
AGE								
<18 years	3341	66	1447	29	240	5	5028	100
18-24 years	22516	78	5622	19	852	3	28990	100
25-29 years	10136	82	1881	15	297	2	12314	100
30-34 years	4673	82	900	16	154	3	5727	100
35 + years	2147	79	492	18	85	3	2724	100
ETHNICITY								
White	21645	84	3767	15	480	2	25892	100
Black	15807	75	4619	22	778	4	21204	100
Native American	997	73	321	23	51	4	1369	100
Asian	605	72	209	25	21	3	835	100
Hispanic	3759	69	1426	26	298	5	5483	100
EDUCATION								
<12 years	13473	71	4763	25	857	4	19093	100
High School Graduate	18331	81	3795	17	561	2	22687	100
>12 years	11009	85	1784	14	210	2	13003	100
<<TOTAL>>	42813	78	10342	19	1628	3	54783	100

Table 4
 Trimester of WIC Certification
 by Maternal Age, Ethnicity, and Education *
 North Carolina
 Pregnancy Nutrition Surveillance System 1998

	TRIMESTER OF WIC CERTIFICATION							
	1st Trimester		2nd Trimester		3rd Trimester		<<TOTAL>>	
	Count	%	Count	%	Count	%	Count	%
AGE								
<18 years	1894	43	1771	40	733	17	4398	100
18-24 years	10593	45	8741	37	4459	19	23793	100
25-29 years	4153	43	3553	37	1886	20	9592	100
30-34 years	1765	41	1626	38	878	21	4269	100
35 + years	831	41	800	39	419	20	2050	100
ETHNICITY								
White	10081	49	6746	33	3711	18	20538	100
Black	6722	39	7089	41	3434	20	17245	100
Native American	516	46	445	39	166	15	1127	100
Asian	188	30	271	44	159	26	618	100
Hispanic	1729	38	1940	42	905	20	4574	100
EDUCATION								
<12 years	7292	45	6120	38	2722	17	16134	100
High School Graduate	7923	44	6711	37	3553	20	18187	100
>12 years	4021	41	3660	37	2100	21	9781	100
<<TOTAL>>	19236	44	16491	37	8375	19	44102	100

* Includes only mothers enrolled in WIC.

Table 5
 Birthweight Distribution
 by Maternal Age, Ethnicity, and Education
 North Carolina
 Pregnancy Nutrition Surveillance System 1998

	BIRTHWEIGHT							
	<2500 grams		2500-4500 grams		4500+ grams		<<TOTAL>>	
	Count	%	Count	%	Count	%	Count	%
AGE								
<18 years	566	11	4512	88	25	0	5103	100
18-24 years	2696	9	26288	90	308	1	29292	100
25-29 years	1143	9	11102	89	193	2	12438	100
30-34 years	666	12	5024	87	97	2	5787	100
35 + years	404	15	2303	84	45	2	2752	100
ETHNICITY								
White	2153	8	23468	90	412	2	26033	100
Black	2803	13	18540	86	169	1	21512	100
Native American	154	11	1220	88	19	1	1393	100
Asian	57	7	777	92	9	1	843	100
Hispanic	308	6	5224	93	59	1	5591	100
EDUCATION								
<12 years	1962	10	17288	89	172	1	19422	100
High School Graduate	2274	10	20297	89	303	1	22874	100
>12 years	1239	9	11644	89	193	1	13076	100
<<TOTAL>>	5475	10	49229	89	668	1	55372	100

Table 6
 Birthweight Distribution by Maternal Prepregnancy Weight
 and Smoking Status During Pregnancy *
 North Carolina
 Pregnancy Nutrition Surveillance System 1998

PREPREGNANCY WEIGHT BY SMOKING		BIRTHWEIGHT							
		<2500 grams		2500-4500 grams		4500+ grams		<<TOTAL>>	
		Count	%	Count	%	Count	%	Count	%
Underweight	Smokers	355	16	1845	84	4	0	2204	100
	Non-smokers	497	11	4103	89	15	0	4615	100
	<SUBTOTAL>	852	12	5948	87	19	0	6819	100
Normal weight	Smokers	582	12	4127	87	23	0	4732	100
	Non-smokers	1039	7	12837	92	147	1	14023	100
	<SUBTOTAL>	1621	9	16964	90	170	1	18755	100
Overweight	Smokers	412	10	3683	89	42	1	4137	100
	Non-smokers	1096	8	12874	90	292	2	14262	100
	<SUBTOTAL>	1508	8	16557	90	334	2	18399	100
All Weights	Smokers	1349	12	9655	87	69	1	11073	100
	Non-smokers	2632	8	29814	91	454	1	32900	100
	<SUBTOTAL>	3981	9	39469	90	523	1	43973	100

* Includes only mothers enrolled in WIC.

Table 7
Breastfeeding at Maternal Postpartum WIC Visit
by Maternal Ethnicity and Age *
North Carolina
Pregnancy Nutrition Surveillance System 1998

ETHNICITY BY AGE		BREASTFEEDING					
		Yes		No		<<TOTAL>>	
		Count	%	Count	%	Count	%
White	<18 years	408	22	1466	78	1874	100
	18-24 years	3525	29	8810	71	12335	100
	25-29 years	1819	35	3423	65	5242	100
	30-34 years	855	39	1345	61	2200	100
	35 + years	466	44	604	56	1070	100
	<SUBTOTAL>	7073	31	15648	69	22721	100
Black	<18 years	260	13	1765	87	2025	100
	18-24 years	1908	20	7652	80	9560	100
	25-29 years	1009	26	2855	74	3864	100
	30-34 years	593	29	1459	71	2052	100
	35 + years	286	27	757	73	1043	100
	<SUBTOTAL>	4056	22	14488	78	18544	100
Native American	<18 years	22	17	108	83	130	100
	18-24 years	144	22	499	78	643	100
	25-29 years	73	32	153	68	226	100
	30-34 years	42	37	73	63	115	100
	35 + years	20	40	30	60	50	100
	<SUBTOTAL>	301	26	863	74	1164	100
Asian	<18 years	11	18	49	82	60	100

(CONTINUED)

* Includes only mothers enrolled in WIC.

Table 7
Breastfeeding at Maternal Postpartum WIC Visit
by Maternal Ethnicity and Age *
North Carolina
Pregnancy Nutrition Surveillance System 1998

ETHNICITY BY AGE		BREASTFEEDING					
		Yes		No		<<TOTAL>>	
		Count	%	Count	%	Count	%
Asian	18-24 years	94	31	209	69	303	100
	25-29 years	77	39	119	61	196	100
	30-34 years	52	46	60	54	112	100
	35 + years	23	37	40	63	63	100
	<SUBTOTAL>	257	35	477	65	734	100
Hispanic	<18 years	173	51	169	49	342	100
	18-24 years	1453	60	984	40	2437	100
	25-29 years	855	64	478	36	1333	100
	30-34 years	390	65	212	35	602	100
	35 + years	139	63	82	37	221	100
<SUBTOTAL>	3010	61	1925	39	4935	100	
All Races	<18 years	874	20	3557	80	4431	100
	18-24 years	7124	28	18154	72	25278	100
	25-29 years	3833	35	7028	65	10861	100
	30-34 years	1932	38	3149	62	5081	100
	35 + years	934	38	1513	62	2447	100
<SUBTOTAL>	14697	31	33401	69	48098	100	

* Includes only mothers enrolled in WIC.

Table 8
Breastfeeding at Maternal Postpartum WIC Visit
by Maternal Ethnicity and Education *
North Carolina
Pregnancy Nutrition Surveillance System 1998

ETHNICITY BY EDUCATION		BREASTFEEDING					
		Yes		No		<<TOTAL>>	
		Count	%	Count	%	Count	%
White	<12 years	1520	21	5864	79	7384	100
	High School Graduate	3051	30	6964	70	10015	100
	>12 years	2495	47	2803	53	5298	100
	<SUBTOTAL>	7066	31	15631	69	22697	100
Black	<12 years	688	13	4773	87	5461	100
	High School Graduate	1559	19	6483	81	8042	100
	>12 years	1800	36	3220	64	5020	100
	<SUBTOTAL>	4047	22	14476	78	18523	100
Native American	<12 years	66	15	386	85	452	100
	High School Graduate	128	27	346	73	474	100
	>12 years	106	45	129	55	235	100
	<SUBTOTAL>	300	26	861	74	1161	100
Asian	<12 years	37	16	198	84	235	100
	High School Graduate	105	35	195	65	300	100
	>12 years	115	60	76	40	191	100
	<SUBTOTAL>	257	35	469	65	726	100
Hispanic	<12 years	1937	61	1260	39	3197	100

(CONTINUED)

* Includes only mothers enrolled in WIC.

Table 8
Breastfeeding at Maternal Postpartum WIC Visit
by Maternal Ethnicity and Education *
North Carolina
Pregnancy Nutrition Surveillance System 1998

ETHNICITY BY EDUCATION		BREASTFEEDING					
		Yes		No		<<TOTAL>>	
		Count	%	Count	%	Count	%
Hispanic	High School Graduate	672	60	447	40	1119	100
	>12 years	367	64	205	36	572	100
	<SUBTOTAL>	2976	61	1912	39	4888	100
All Races	<12 years	4248	25	12481	75	16729	100
	High School Graduate	5515	28	14435	72	19950	100
	>12 years	4883	43	6433	57	11316	100
	<SUBTOTAL>	14646	31	33349	69	47995	100

* Includes only mothers enrolled in WIC.

Table 9
 Interpregnancy Interval *
 By Ethnicity and Maternal Age
 North Carolina
 Pregnancy Nutrition Surveillance 1998

ETHNICITY BY AGE		INTERPREGNANCY INTERVAL							
		First Birth		<12 months between pregnancies		12+ months between pregnancies		<<TOTAL>>	
		Count	%	Count	%	Count	%	Count	%
White	<18 years	1900	88	179	8	89	4	2168	100
	18-24 years	6908	48	2553	18	4815	34	14276	100
	25-29 years	1317	22	957	16	3681	62	5955	100
	30-34 years	420	17	392	16	1716	68	2528	100
	35 + years	196	16	193	16	831	68	1220	100
	<SUBTOTAL>	10741	41	4274	16	11132	43	26147	100
Black	<18 years	1956	83	215	9	179	8	2350	100
	18-24 years	4596	41	2331	21	4327	38	11254	100
	25-29 years	798	18	815	18	2928	64	4541	100
	30-34 years	339	14	356	15	1658	70	2353	100
	35 + years	155	13	148	13	878	74	1181	100
	<SUBTOTAL>	7844	36	3865	18	9970	46	21679	100
Native American	<18 years	140	88	15	9	5	3	160	100
	18-24 years	330	43	170	22	273	35	773	100
	25-29 years	54	20	41	15	178	65	273	100
	30-34 years	17	13	21	16	97	72	135	100
	35 + years	4	7	5	9	49	84	58	100
	<SUBTOTAL>	545	39	252	18	602	43	1399	100

(CONTINUED)

* Interpregnancy interval is the number of months from the end of the last pregnancy to conception of the current pregnancy

Table 9
 Interpregnancy Interval *
 By Ethnicity and Maternal Age
 North Carolina
 Pregnancy Nutrition Surveillance 1998

ETHNICITY BY AGE		INTERPREGNANCY INTERVAL							
		First Birth		<12 months between pregnancies		12+ months between pregnancies		<<TOTAL>>	
		Count	%	Count	%	Count	%	Count	%
Asian	<18 years	59	83	9	13	3	4	71	100
	18-24 years	181	51	87	24	88	25	356	100
	25-29 years	78	36	37	17	104	47	219	100
	30-34 years	24	19	17	13	88	68	129	100
	35 + years	11	16	6	9	52	75	69	100
	<SUBTOTAL>	353	42	156	18	335	40	844	100
Hispanic	<18 years	350	86	36	9	19	5	405	100
	18-24 years	1326	48	451	16	998	36	2775	100
	25-29 years	325	22	218	14	961	64	1504	100
	30-34 years	99	14	102	15	482	71	683	100
	35 + years	27	11	27	11	192	78	246	100
	<SUBTOTAL>	2127	38	834	15	2652	47	5613	100
All Races	<18 years	4405	85	454	9	295	6	5154	100
	18-24 years	13341	45	5592	19	10501	36	29434	100
	25-29 years	2572	21	2068	17	7852	63	12492	100
	30-34 years	899	15	888	15	4041	69	5828	100
	35 + years	393	14	379	14	2002	72	2774	100
	<SUBTOTAL>	21610	39	9381	17	24691	44	55682	100
<<TOTAL>>	21610	39	9381	17	24691	44	55682	100	

Table 10
 Interpregnancy Interval *
 By Ethnicity and Maternal Education
 North Carolina
 Pregnancy Nutrition Surveillance 1998

ETHNICITY BY EDUCATION		INTERPREGNANCY INTERVAL							
		First Birth		<12 months between pregnancies		12+ months between pregnancies		<<TOTAL>>	
		Count	%	Count	%	Count	%	Count	%
White	<12 years	3834	45	1478	17	3239	38	8551	100
	High School Graduate	4520	39	1785	16	5161	45	11466	100
	>12 years	2387	39	1011	16	2732	45	6130	100
	<SUBTOTAL>	10741	41	4274	16	11132	43	26147	100
Black	<12 years	2935	45	1208	19	2313	36	6456	100
	High School Graduate	2992	32	1694	18	4689	50	9375	100
	>12 years	1917	33	963	16	2968	51	5848	100
	<SUBTOTAL>	7844	36	3865	18	9970	46	21679	100
Native American	<12 years	245	44	104	19	203	37	552	100
	High School Graduate	200	35	104	18	271	47	575	100
	>12 years	100	37	44	16	128	47	272	100
	<SUBTOTAL>	545	39	252	18	602	43	1399	100
Asian	<12 years	114	41	58	21	105	38	277	100
	High School Graduate	137	40	67	20	137	40	341	100
	>12 years	102	45	31	14	93	41	226	100
	<SUBTOTAL>	353	42	156	18	335	40	844	100

(CONTINUED)

* Interpregnancy interval is the number of months from the end of the last pregnancy to conception of the current pregnancy

Table 10
 Interpregnancy Interval *
 By Ethnicity and Maternal Education
 North Carolina
 Pregnancy Nutrition Surveillance 1998

ETHNICITY BY EDUCATION		INTERPREGNANCY INTERVAL							
		First Birth		<12 months between pregnancies		12+ months between pregnancies		<<TOTAL>>	
		Count	%	Count	%	Count	%	Count	%
Hispanic	<12 years	1359	37	557	15	1783	48	3699	100
	High School Graduate	521	41	161	13	579	46	1261	100
	>12 years	247	38	116	18	290	44	653	100
	<SUBTOTAL>	2127	38	834	15	2652	47	5613	100
All Races	<12 years	8487	43	3405	17	7643	39	19535	100
	High School Graduate	8370	36	3811	17	10837	47	23018	100
	>12 years	4753	36	2165	16	6211	47	13129	100
	<SUBTOTAL>	21610	39	9381	17	24691	44	55682	100
<<TOTAL>>		21610	39	9381	17	24691	44	55682	100

* Interpregnancy interval is the number of months from the end of the last pregnancy to conception of the current pregnancy

Table 11
 Prepregnancy Weight *
 By Ethnicity and Maternal Age
 North Carolina
 Pregnancy Nutrition Surveillance 1998

ETHNICITY BY AGE		PREPREGNANCY WEIGHT							
		Underweight		Normal weight		Overweight		<<TOTAL>>	
		Count	%	Count	%	Count	%	Count	%
White	<18 years	609	33	894	48	349	19	1852	100
	18-24 years	2334	20	5065	44	4169	36	11568	100
	25-29 years	553	12	1828	41	2127	47	4508	100
	30-34 years	189	10	727	40	890	49	1806	100
	35 + years	92	11	384	44	399	46	875	100
	<SUBTOTAL>	3777	18	8898	43	7934	38	20609	100
Black	<18 years	393	20	1082	54	525	26	2000	100
	18-24 years	1341	15	3877	42	3981	43	9199	100
	25-29 years	333	9	1149	32	2126	59	3608	100
	30-34 years	108	6	546	31	1111	63	1765	100
	35 + years	61	7	258	29	573	64	892	100
	<SUBTOTAL>	2236	13	6912	40	8316	48	17464	100
Native American	<18 years	35	26	65	48	35	26	135	100
	18-24 years	108	17	255	41	257	41	620	100
	25-29 years	29	13	78	35	114	52	221	100
	30-34 years	11	11	29	28	63	61	103	100
	35 + years	4	8	17	35	28	57	49	100
	<SUBTOTAL>	187	17	444	39	497	44	1128	100

(CONTINUED)

* Based on self-reported weight and height.

Table 11
 Prepregnancy Weight *
 By Ethnicity and Maternal Age
 North Carolina
 Pregnancy Nutrition Surveillance 1998

ETHNICITY BY AGE		PREPREGNANCY WEIGHT							
		Underweight		Normal weight		Overweight		<<TOTAL>>	
		Count	%	Count	%	Count	%	Count	%
Asian	<18 years	22	35	29	46	12	19	63	100
	18-24 years	88	32	148	54	38	14	274	100
	25-29 years	50	31	83	51	30	18	163	100
	30-34 years	26	30	39	45	21	24	86	100
	35 + years	5	11	29	64	11	24	45	100
	<SUBTOTAL>	191	30	328	52	112	18	631	100
Hispanic	<18 years	55	18	188	60	71	23	314	100
	18-24 years	280	13	1211	56	663	31	2154	100
	25-29 years	87	8	532	47	517	46	1136	100
	30-34 years	27	5	230	44	265	51	522	100
	35 + years	6	3	79	39	116	58	201	100
	<SUBTOTAL>	455	11	2240	52	1632	38	4327	100
All Races	<18 years	1114	26	2258	52	992	23	4364	100
	18-24 years	4151	17	10556	44	9108	38	23815	100
	25-29 years	1052	11	3670	38	4914	51	9636	100
	30-34 years	361	8	1571	37	2350	55	4282	100
	35 + years	168	8	767	37	1127	55	2062	100
	<SUBTOTAL>	6846	16	18822	43	18491	42	44159	100
<<TOTAL>>	6846	16	18822	43	18491	42	44159	100	

* Based on self-reported weight and height.

Table 12
 Prepregnancy Weight *
 By Ethnicity and Maternal Education
 North Carolina
 Pregnancy Nutrition Surveillance 1998

ETHNICITY BY EDUCATION		PREPREGNANCY WEIGHT							
		Underweight		Normal weight		Overweight		<<TOTAL>>	
		Count	%	Count	%	Count	%	Count	%
White	<12 years	1661	23	3045	43	2405	34	7111	100
	High School Graduate	1500	17	3860	43	3661	41	9021	100
	>12 years	616	14	1993	45	1868	42	4477	100
	<SUBTOTAL>	3777	18	8898	43	7934	38	20609	100
Black	<12 years	805	15	2374	45	2068	39	5247	100
	High School Graduate	956	13	2797	37	3834	51	7587	100
	>12 years	475	10	1741	38	2414	52	4630	100
	<SUBTOTAL>	2236	13	6912	40	8316	48	17464	100
Native American	<12 years	94	21	176	39	179	40	449	100
	High School Graduate	75	16	179	38	219	46	473	100
	>12 years	18	9	89	43	99	48	206	100
	<SUBTOTAL>	187	17	444	39	497	44	1128	100
Asian	<12 years	66	30	112	50	45	20	223	100
	High School Graduate	76	29	146	56	38	15	260	100
	>12 years	49	33	70	47	29	20	148	100
	<SUBTOTAL>	191	30	328	52	112	18	631	100

(CONTINUED)

* Based on self-reported weight and height.

Table 12
 Prepregnancy Weight *
 By Ethnicity and Maternal Education
 North Carolina
 Pregnancy Nutrition Surveillance 1998

ETHNICITY BY EDUCATION		PREPREGNANCY WEIGHT							
		Underweight		Normal weight		Overweight		<<TOTAL>>	
		Count	%	Count	%	Count	%	Count	%
Hispanic	<12 years	277	10	1434	51	1095	39	2806	100
	High School Graduate	118	12	528	52	363	36	1009	100
	>12 years	60	12	278	54	174	34	512	100
	<SUBTOTAL>	455	11	2240	52	1632	38	4327	100
All Races	<12 years	2903	18	7141	45	5792	37	15836	100
	High School Graduate	2725	15	7510	41	8115	44	18350	100
	>12 years	1218	12	4171	42	4584	46	9973	100
	<SUBTOTAL>	6846	16	18822	43	18491	42	44159	100
<<TOTAL>>		6846	16	18822	43	18491	42	44159	100

* Based on self-reported weight and height.

Table 13
 Five Minute Apgar Score
 By Ethnicity and Maternal Age
 North Carolina
 Pregnancy Nutrition Surveillance 1998

ETHNICITY BY AGE		APGAR SCORE					
		Apgar score <7		Apgar Score 7+		<<TOTAL>>	
		Count	%	Count	%	Count	%
White	<18 years	58	3	2110	97	2168	100
	18-24 years	264	2	14012	98	14276	100
	25-29 years	98	2	5857	98	5955	100
	30-34 years	69	3	2459	97	2528	100
	35 + years	39	3	1181	97	1220	100
	<SUBTOTAL>	528	2	25619	98	26147	100
Black	<18 years	83	4	2267	96	2350	100
	18-24 years	360	3	10894	97	11254	100
	25-29 years	167	4	4374	96	4541	100
	30-34 years	87	4	2266	96	2353	100
	35 + years	67	6	1114	94	1181	100
	<SUBTOTAL>	764	4	20915	96	21679	100
Native American	<18 years	3	2	157	98	160	100
	18-24 years	20	3	753	97	773	100
	25-29 years	13	5	260	95	273	100
	30-34 years	5	4	130	96	135	100
	35 + years	.	.	58	100	58	100
	<SUBTOTAL>	41	3	1358	97	1399	100

(CONTINUED)

Table 13
 Five Minute Apgar Score
 By Ethnicity and Maternal Age
 North Carolina
 Pregnancy Nutrition Surveillance 1998

ETHNICITY BY AGE		APGAR SCORE					
		Apgar score <7		Apgar Score 7+		<<TOTAL>>	
		Count	%	Count	%	Count	%
Asian	<18 years	.	.	71	100	71	100
	18-24 years	7	2	349	98	356	100
	25-29 years	2	1	217	99	219	100
	30-34 years	1	1	128	99	129	100
	35 + years	1	1	68	99	69	100
	<SUBTOTAL>	11	1	833	99	844	100
Hispanic	<18 years	9	2	396	98	405	100
	18-24 years	57	2	2718	98	2775	100
	25-29 years	27	2	1477	98	1504	100
	30-34 years	15	2	668	98	683	100
	35 + years	2	1	244	99	246	100
	<SUBTOTAL>	110	2	5503	98	5613	100
All Races	<18 years	153	3	5001	97	5154	100
	18-24 years	708	2	28726	98	29434	100
	25-29 years	307	2	12185	98	12492	100
	30-34 years	177	3	5651	97	5828	100
	35 + years	109	4	2665	96	2774	100
	<SUBTOTAL>	1454	3	54228	97	55682	100
<<TOTAL>>		1454	3	54228	97	55682	100

Table 14
 Five Minute Apgar Score
 By Ethnicity and Maternal Education
 North Carolina
 Pregnancy Nutrition Surveillance 1998

ETHNICITY BY EDUCATION		APGAR SCORE					
		Apgar score <7		Apgar Score 7+		<<TOTAL>>	
		Count	%	Count	%	Count	%
White	<12 years	187	2	8364	98	8551	100
	High School Graduate	220	2	11246	98	11466	100
	>12 years	121	2	6009	98	6130	100
	<SUBTOTAL>	528	2	25619	98	26147	100
Black	<12 years	223	3	6233	97	6456	100
	High School Graduate	341	4	9034	96	9375	100
	>12 years	200	3	5648	97	5848	100
	<SUBTOTAL>	764	4	20915	96	21679	100
Native American	<12 years	16	3	536	97	552	100
	High School Graduate	20	3	555	97	575	100
	>12 years	5	2	267	98	272	100
	<SUBTOTAL>	41	3	1358	97	1399	100
Asian	<12 years	3	1	274	99	277	100
	High School Graduate	4	1	337	99	341	100
	>12 years	4	2	222	98	226	100
	<SUBTOTAL>	11	1	833	99	844	100

(CONTINUED)

Table 14
 Five Minute Apgar Score
 By Ethnicity and Maternal Education
 North Carolina
 Pregnancy Nutrition Surveillance 1998

ETHNICITY BY EDUCATION		APGAR SCORE					
		Apgar score <7		Apgar Score 7+		<<TOTAL>>	
		Count	%	Count	%	Count	%
Hispanic	<12 years	76	2	3623	98	3699	100
	High School Graduate	21	2	1240	98	1261	100
	>12 years	13	2	640	98	653	100
	<SUBTOTAL>	110	2	5503	98	5613	100
All Races	<12 years	505	3	19030	97	19535	100
	High School Graduate	606	3	22412	97	23018	100
	>12 years	343	3	12786	97	13129	100
	<SUBTOTAL>	1454	3	54228	97	55682	100
<<TOTAL>>		1454	3	54228	97	55682	100

Table 15
 Adequacy of Prenatal Care *
 By Ethnicity and Maternal Age
 North Carolina
 Pregnancy Nutrition Surveillance 1998

ETHNICITY BY AGE		PRENATAL CARE ADEQUACY							
		Adequate		Intermediate		Inadequate		<<TOTAL>>	
		Count	%	Count	%	Count	%	Count	%
White	<18 years	1469	69	566	26	106	5	2141	100
	18-24 years	11141	79	2593	18	407	3	14141	100
	25-29 years	4920	83	846	14	134	2	5900	100
	30-34 years	2029	81	397	16	66	3	2492	100
	35 + years	960	80	204	17	37	3	1201	100
	<SUBTOTAL>	20519	79	4606	18	750	3	25875	100
Black	<18 years	1231	54	832	37	201	9	2264	100
	18-24 years	7468	68	2882	26	671	6	11021	100
	25-29 years	3336	75	889	20	220	5	4445	100
	30-34 years	1733	76	438	19	120	5	2291	100
	35 + years	832	72	249	22	71	6	1152	100
	<SUBTOTAL>	14600	69	5290	25	1283	6	21173	100
Native American	<18 years	89	57	57	37	10	6	156	100
	18-24 years	496	66	220	29	38	5	754	100
	25-29 years	201	75	57	21	11	4	269	100

(CONTINUED)

* Based on Kessner Index of Adequacy of Prenatal Care.

Table 15
 Adequacy of Prenatal Care *
 By Ethnicity and Maternal Age
 North Carolina
 Pregnancy Nutrition Surveillance 1998

ETHNICITY BY AGE		PRENATAL CARE ADEQUACY							
		Adequate		Intermediate		Inadequate		<<TOTAL>>	
		Count	%	Count	%	Count	%	Count	%
Native American	30-34 years	95	73	28	22	7	5	130	100
	35 + years	43	74	10	17	5	9	58	100
	<SUBTOTAL>	924	68	372	27	71	5	1367	100
Asian	<18 years	35	50	30	43	5	7	70	100
	18-24 years	215	61	119	34	18	5	352	100
	25-29 years	153	71	50	23	13	6	216	100
	30-34 years	91	71	33	26	5	4	129	100
	35 + years	43	64	21	31	3	4	67	100
	<SUBTOTAL>	537	64	253	30	44	5	834	100
Hispanic	<18 years	213	55	137	35	40	10	390	100
	18-24 years	1613	60	818	30	269	10	2700	100
	25-29 years	902	61	446	30	122	8	1470	100
	30-34 years	415	62	204	30	53	8	672	100
	35 + years	148	61	68	28	27	11	243	100
	<SUBTOTAL>	3291	60	1673	31	511	9	5475	100

(CONTINUED)

* Based on Kessner Index of Adequacy of Prenatal Care.

Table 15
 Adequacy of Prenatal Care *
 By Ethnicity and Maternal Age
 North Carolina
 Pregnancy Nutrition Surveillance 1998

ETHNICITY BY AGE	PRENATAL CARE ADEQUACY							
	Adequate		Intermediate		Inadequate		<<TOTAL>>	
	Count	%	Count	%	Count	%	Count	%
All Races <18 years	3037	60	1622	32	362	7	5021	100
18-24 years	20933	72	6632	23	1403	5	28968	100
25-29 years	9512	77	2288	19	500	4	12300	100
30-34 years	4363	76	1100	19	251	4	5714	100
35 + years	2026	74	552	20	143	5	2721	100
<SUBTOTAL>	39871	73	12194	22	2659	5	54724	100
<<TOTAL>>	39871	73	12194	22	2659	5	54724	100

* Based on Kessner Index of Adequacy of Prenatal Care.

Table 16
 Adequacy of Prenatal Care *
 By Ethnicity and Maternal Education
 North Carolina
 Pregnancy Nutrition Surveillance 1998

ETHNICITY BY EDUCATION		PRENATAL CARE ADEQUACY							
		Adequate		Intermediate		Inadequate		<<TOTAL>>	
		Count	%	Count	%	Count	%	Count	%
White	<12 years	6174	73	1912	23	355	4	8441	100
	High School Graduate	9223	81	1859	16	279	2	11361	100
	>12 years	5122	84	835	14	116	2	6073	100
	<SUBTOTAL>	20519	79	4606	18	750	3	25875	100
Black	<12 years	3638	58	2002	32	589	9	6229	100
	High School Graduate	6491	71	2165	24	506	6	9162	100
	>12 years	4471	77	1123	19	188	3	5782	100
	<SUBTOTAL>	14600	69	5290	25	1283	6	21173	100
Native American	<12 years	326	61	169	31	42	8	537	100
	High School Graduate	404	72	134	24	22	4	560	100
	>12 years	194	72	69	26	7	3	270	100
	<SUBTOTAL>	924	68	372	27	71	5	1367	100
Asian	<12 years	136	50	120	44	17	6	273	100
	High School Graduate	229	68	89	26	19	6	337	100
	>12 years	172	77	44	20	8	4	224	100

(CONTINUED)

* Based on Kessner Index of Adequacy of Prenatal Care.

Table 16
 Adequacy of Prenatal Care *
 By Ethnicity and Maternal Education
 North Carolina
 Pregnancy Nutrition Surveillance 1998

ETHNICITY BY EDUCATION		PRENATAL CARE ADEQUACY							
		Adequate		Intermediate		Inadequate		<<TOTAL>>	
		Count	%	Count	%	Count	%	Count	%
Asian	<SUBTOTAL>	537	64	253	30	44	5	834	100
Hispanic	<12 years	1931	54	1244	35	419	12	3594	100
	High School Graduate	871	70	306	25	61	5	1238	100
	>12 years	489	76	123	19	31	5	643	100
	<SUBTOTAL>	3291	60	1673	31	511	9	5475	100
All Races	<12 years	12205	64	5447	29	1422	7	19074	100
	High School Graduate	17218	76	4553	20	887	4	22658	100
	>12 years	10448	80	2194	17	350	3	12992	100
	<SUBTOTAL>	39871	73	12194	22	2659	5	54724	100
<<TOTAL>>		39871	73	12194	22	2659	5	54724	100

Table 17
 Trimester of Prenatal WIC Enrollment
 And First Prenatal Care Visit
 North Carolina
 Pregnancy Nutrition Surveillance 1998

	TRIMESTER OF WIC ENROLLMENT							
	1st Trimester		2nd Trimester		3rd Trimester		<<TOTAL>>	
	Count	%	Count	%	Count	%	Count	%
TRIMESTER OF FIRST PRENATAL VISIT								
No Care	37	25	53	36	57	39	147	100
1st Trimester	17532	51	11316	33	5469	16	34317	100
2nd Trimester	1515	18	4786	58	1935	23	8236	100
3rd Trimester	101	8	283	23	850	69	1234	100
<<TOTAL>>	19185	44	16438	37	8311	19	43934	100

* Includes mothers who enrolled in WIC postpartum as well as mothers who were not enrolled in WIC.

Table 18
 Iron-Deficiency Anemia
 By Ethnicity and Maternal Age
 North Carolina
 Pregnancy Nutrition Surveillance 1998

ETHNICITY BY AGE		IRON-DEFICIENCY ANEMIA					
		Yes		No		<<TOTAL>>	
		Count	%	Count	%	Count	%
White	<18 years	119	7	1590	93	1709	100
	18-24 years	728	7	10061	93	10789	100
	25-29 years	271	6	3946	94	4217	100
	30-34 years	121	7	1554	93	1675	100
	35 + years	64	8	747	92	811	100
	<SUBTOTAL>	1303	7	17898	93	19201	100
Black	<18 years	367	22	1287	78	1654	100
	18-24 years	1516	19	6481	81	7997	100
	25-29 years	560	18	2529	82	3089	100
	30-34 years	295	19	1267	81	1562	100
	35 + years	170	22	590	78	760	100
	<SUBTOTAL>	2908	19	12154	81	15062	100
Native American	<18 years	16	12	116	88	132	100
	18-24 years	63	10	541	90	604	100
	25-29 years	23	12	177	89	200	100
	30-34 years	12	12	90	88	102	100
	35 + years	6	13	39	87	45	100
	<SUBTOTAL>	120	11	963	89	1083	100

(CONTINUED)

Table 18
 Iron-Deficiency Anemia
 By Ethnicity and Maternal Age
 North Carolina
 Pregnancy Nutrition Surveillance 1998

ETHNICITY BY AGE		IRON-DEFICIENCY ANEMIA					
		Yes		No		<<TOTAL>>	
		Count	%	Count	%	Count	%
Asian	<18 years	5	11	40	89	45	100
	18-24 years	23	10	216	90	239	100
	25-29 years	18	13	119	87	137	100
	30-34 years	11	15	64	85	75	100
	35 + years	9	23	31	78	40	100
	<SUBTOTAL>	66	12	470	88	536	100
Hispanic	<18 years	38	13	244	87	282	100
	18-24 years	193	10	1788	90	1981	100
	25-29 years	91	9	945	91	1036	100
	30-34 years	48	10	438	90	486	100
	35 + years	19	10	169	90	188	100
	<SUBTOTAL>	389	10	3584	90	3973	100
All Races	<18 years	545	14	3277	86	3822	100
	18-24 years	2523	12	19087	88	21610	100
	25-29 years	963	11	7716	89	8679	100
	30-34 years	487	12	3413	88	3900	100
	35 + years	268	15	1576	85	1844	100
	<SUBTOTAL>	4786	12	35069	88	39855	100