Pediatric and Pregnancy Nutrition Surveillance

> West Virginia 2001



Nutrition Surveillance Report

of the

West Virginia WIC Program

2001



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# **Data Considerations**

The figures cited in this report are taken from a variety of sources. The focus of this report is on West Virginia residents who are children aged from birth to their fifth birthday, and on women who are pregnant, or who have recently given birth, or who breastfeed their infants. Further, this population is a low-income population; this data is derived from the federally-funded Special Supplemental Nutrition Program for Women, Infants and Children (WIC), a means-tested program, which is operated in West Virginia by the Bureau for Public Health, Office of Nutrition Services, as the West Virginia WIC Program. A short description of the West Virginia WIC Program's functions and coverage is included in this report.

The demographic profiles presented here use US Census Bureau data from the 2000 Census as the denominator. The data in the Health and Nutrition Risk sections are taken from the Pediatric Nutrition Surveillance System (PedNSS) and the Pregnancy Nutrition Surveillance System (PNSS). These data systems use the height and weight measurements, hemoglobin screening values, demographic information and health and behavior information obtained at WIC clinics during certification for participation. The two data systems are supported by the US Centers for Disease Control.

The West Virginia WIC Program sends data to both systems, along with 46 states and territories participating in the PedNSS, and 29 states and territories participating in PNSS. Nationwide, contributors of data include Early Periodic Screening and Treatment Programs and Maternal and Child Health Programs, but WIC is the primary contributor, with 82% of the data originating from WIC. Unless otherwise noted, the 'national' figures cited are a cumulation of these states and territories, and the reporting period is the calendar year of 2001. The size of the West Virginia database for 2001 data is 52,681 individual infants and children, and 10,732 women with WIC enrollment during pregnancy and continuing through the postpartum period. Subgroups of less than 100 people are not reported for data quality reasons. This sample size restriction only affects some demographic data in West Virginia.

The Centers for Disease Control establishes benchmarks for expected population prevalence of given height and weight indexes. The CDC recalculated the growth curves for children in 2000, so that the prevalence in a population for a given condition has changed slightly. Trend data in this report has past year prevalences updated to reflect the 2000 growth charts. The CDC has set an expected healthy population prevalence at the upper and lower fifth percentile of the growth curves, so that reported prevalence in excess of five percent is an indicator of health risk in the population. WIC nutrition risk criterion uses the 10<sup>th</sup> percentile for heights and weights to establish eligibility. Therefore, there are children enrolled in WIC with measurements much lower or higher than the population norm, but not represented within this report. Most behavioral data, such as smoking or breastfeeding, have benchmarks established as goals for Healthy People 2010 included in this report.

# Description of the West Virginia WIC Program

The Special Supplemental Nutrition Program for Women, Infants and Children (WIC) is a nutrition program for low income infants, children up to five years of age, and pregnant, breastfeeding and postpartum women at nutrition or medical risk. WIC was established in 1972, following a national survey that found anemia and inadequate growth to be common among American children in low-income families. The federal funding source is the United States Department of Agriculture (USDA).

The purpose of the WIC program is to prevent poor birth outcomes, such as infant mortality and low birth weight, and to improve the nutrition and health of participants. Dozens of scientific studies have shown WIC to be a cost-effective and positive public health intervention.

WIC provides the following services:

- < vouchers to buy supplemental healthy foods
- < nutrition and health education
- < personal counseling about nutrition for all participants either in an individual setting or in a group class setting.
- < support and help with breastfeeding
- referrals to health care and other programs for those participants who need this type of assistance.

# Eligibility Criteria

Applicants must meet three criteria to participate. The criteria are category, income, and nutrition risk.

The *categories* for eligibility are:

- < Pregnant women
- < Women who breastfeed through the infant's first year
- < Postpartum women to the sixth month after delivery
- < Children from birth to five years of age

*Income* eligibility requires that a household have a gross income at or below 185% of the Federal Poverty Level. This level is adjusted each year.

*Nutrition risk* is a medical or health problem, defined at the national level, that can be corrected or lessened by proper amounts and types of food intake. The presence of a nutrition risk is established by biochemical tests, measurements of height and weight, medical history, and dietary history. Examples of nutrition risk are:

- < low blood hemoglobin levels
- < insufficient growth (i.e., short for age, thin for height)
- < premature delivery
- < inadequate weight gain during pregnancy

### Service Areas

In West Virginia, the WIC Program is administered by the Office of Nutrition Services, Bureau for Public Health, within the Department of Health and Human Resources. Eight local agencies are contracted annually to provide direct participant services. These Local Agencies are monitored by the Office of Nutrition Services for quality of services, fiscal integrity and adherence to state regulations. Currently, West Virginia WIC serves approximately 50,000 West Virginians each month, in 58 clinic sites throughout the state. Each WIC Office has links to a health service agency, to facilitate referral to other health care services. The WIC clinics also work closely with other agencies in the community who help people in need.



**Demographic Characteristics** 

# Population Served in WIC Categories

The estimated number of West Virginia residents within the category of infants and children less than five years of age has decreased 7.4% since 1993. The number of live births in West Virginia is an indirect measure of the potential caseload in the pregnant and postpartum women category, since not all pregnancies result in live births. Further, a woman may be a resident of West Virginia during pregnancy, but immigrate prior to delivery, and vice-versa. The number of live births in West Virginia has decreased 4.3% since 1993.

WIC enrollment in West Virginia dropped beginning in 1998, an average loss of 900 participants per year. Using Census estimates for the same period, the number of infants and children estimated to live in WV dropped an average of 1,100 per year, and births stayed relatively the same.

Monthly Average West Virginia WIC Enrollment by Federal Fiscal Year



# Estimated Number of West Virginia Children less than five years of age



\*Population Estimates for the U.S., Regions, Divisions, and States by 5-year Age Groups and Sex: Time Series Estimates, July 1, 1990 to July 1, 1999 and April 1, 1990 Census Population \*\*SF-3 table P-87, 2000 Census

# Number of Live Births\* In West Virginia



\*Source: West Virginia Vital Statistics Summary 2000, WVDHHR, Bureau for Public Health , Office of Epidemiology and Health Promotion

# Family Income

WIC income eligibility is determined by comparing the household's gross income against the maximum allowable, which is 185% of the federal poverty level for the family size. The income guidelines are updated by the federal government every year. Applicants must provide written proof of income. Applicants who are enrolled in Medicaid, TANF or the Food Stamp programs are income eligible, but they must also be found to have a nutrition risk before they are eligible for WIC.

- < 130% is approximately the same as the Food Stamp Program
- < 150% is approximately the same as Medicaid maximum for pregnant women and children to age one
- < 185% is the same as guidelines for reduced school lunch

The exact method to determine eligibility and income for these programs is not alike.

The US Census Bureau estimates for each county the number of child residents from ages birth to five that fall below certain poverty levels. These estimates have been used to approximate WIC program saturation among potentially eligible children. Since the Census Bureau does not collect pregnancy information, women's participant data is not comparable.

# Family Income Level of WV WIC Children



STORC participant file, June 2000

# Enrolled WIC Children

compared to US Census estimates of Income-eligible children



source:US Census Bureau, 2000 Census SF-3 file, table PCT-50 and WIC participant file, June 2000

# Age

# Infant's & Children's Age

Nutrition risk factors vary with age groups, so the proportion of children in each group to the total population are of interest. West Virginia age distribution statistics for WIC participation mirror national statistics, and over the past decade, little change has occurred.

# Age distribution





2001 WV PedNSS Table 1C

An unusually large proportion of a single age group in a given region can make comparisons of risk factors between regions inaccurate. For example, a large proportion of infants in a caseload may cause statistics related to thinness to be overstated because the effects of low birth weight and prematurity are so notable in this age group.

# Age distribution in Local Agencies



<sup>2001</sup> WV PedNSS Table 5E

### Age of Pregnant and Postpartum Women

The percentage of teens participating in WIC continues to drop. In 1998, teens composed 26% of the pregnant or postpartum WIC population, and only 23% in 2001. This is consistent with the general population statistics in West Virginia, where births to teenagers which dropped from 15.5% of all births to 13.7% in the same time period. <sup>1</sup>

# Education

The mother's level of education can be used as a proxy for socioeconomic status.<sup>2</sup> Twenty-two percent of all U.S. women who gave birth in 2001 had less than a high school education <sup>3</sup>, and 36% of PNSS women in all states participating in the system had less than a high school education. In the 2001 West Virginia PNSS, this proportion was 33%.

# Marital Status

In the 2001 West Virginia PNSS, 49.6% of mothers were unmarried and 50.4% were married. Data varied by region; about 60% of mothers were unmarried in the Shenandoah WIC Local Agency, and about 41% were unmarried in the Randolph-Elkins WIC Local Agency. For comparison, 60% of PNSS women in all states participating in the system were unmarried, and 33% of all U.S. women who gave birth in 2001 were unmarried <sup>3</sup>. Of all West Virginia women who gave birth in 2000, 32% were unmarried. <sup>4</sup>

# Age distribution

among pregnant or postpartum women



2001 PNSS Table 1C

# **Marital Status**

among pregnant or postpartum women



2001 PNSS Table 1C, 1D

# Race and Ethnicity

Two racial group constitute 98% of the West Virginia PedNSS population. Since 1992, only very slight change in the distribution of participation by child's race is apparent in West Virginia. This distribution is consistent with the 2000 Census racial distribution in the general West Virginia population.

White, non-Hispanic children form 92.4% of the PedNSS population, and Black, non-Hispanic children form 6.0%. Hispanic children of any race compose 0.5%, Asian and Pacific Islanders are 0.2%, American Indian/Alaskan Natives are 0.1% and all others are 0.8% of PedNSS.

Pregnant and postpartum participation rates reflect this same distribution as well. Some risk factors are known to vary by race, so that the racial and ethnic distribution of the region served is of interest.

# Racial and Ethnic Distribution

among infants and children



2001 WV PedNSS Table 1C

Health and Nutrition Risk Indicators

Infants and Children

#### **Short Stature**

Short stature is defined as a height-for-age value below the 5th percentile of the 2000 CDC height reference. It reflects the long term health and nutrition history of a child, or on an individual level, shortness can reflect the normal variation of growth such as lower birth weight or short parental stature. The overall prevalence of shortness dropped in West Virginia, using the new 2000 CDC growth reference, meeting the Year 2010 goal of less than 5%.<sup>5</sup> Children under the age of one year have the highest rate of low height for age, due to the inclusion of premature infants in the records.

# Prevalence of Short Stature



\* ≤ 5th percentile length or height-for-age, CDC Growth Charts, 2000\*\*Reduce growth retardation (short stature) among low-income children under age 5 years to 5%. 2001 WV PedNSS Table 8C

#### Short Stature Trends

In order to preserve population trend data, height-for-age measurements obtained between 1992 and 1999 were recalculated using the 2000 CDC growth reference. In West Virginia, the prevalence of low height-for age for all years and all racial and ethnic groups averaged 4.8%, down from 7.5% under the old 1977 NCHS growth reference.

This decrease is consistent with the CDC's projection of a 2% to 4% decrease in prevalence when using the new growth reference.<sup>6</sup> West Virginia has a better overall rate for low height-for-age than the nation, and trends are toward continued decline.

# Trends in Prevalence of Short Stature \*among children aged < 5 years, by Race and Ethnicity



\* 5th percentile length or height-for-age, CDC Growth Charts, 2000. 2001 PedNSS Table 18C

#### Underweight

Underweight, or thinness, Is defined as a weight-for-height value of less than the 5th percentile of the 2000 CDC growth reference. Thinness is often associated with recent severe disease, but can also be the result of normal individual variation in a population.

Prior to the 2000 CDC growth reference, the prevalence of thinness in West Virginia was well below the expected statistical norm of 5%. The CDC projected a 3% to 5% increase in children classified as underweight when using the new growth curves. The actual increase was 4%. When infants are excluded, the average prevalence is 4.7% in West Virginia, and 4.4% nationally. West Virginia prevalence and national prevalence for infancy alone are 8.4% and 7.2% respectively. There are no Healthy People 2010 targets for underweight.

### Overweight

Overweight defined as weight-for-height or Body Mass Index (BMI) measurements in the 95th percentile and above of the 2000 CDC reference.

Overweight in childhood is an indicator for adult overweight status. One-third to one-half of those children above the 95th percentile will become obese adults. For example, an estimated 50% of overweight children aged three to six will be overweight as adults. This association is less clear for children less than two years of age.<sup>7</sup>

# Prevalence of Underweight\*

among children aged < 5 years, by age



\* ≤ 5th percentile weight-for-length or BMI-for-age, CDC Growth Charts, 2000. 5% of children are expected to fall below the 5th percentile.

2001 WV PedNSS Table 8C

# Prevalence of underweight\* by region



\* ≤ 5th percentile weight-for-length or BMI-for-age, CDC Growth Charts, 2000, 5 % of children are expected to fall below the 5th percentile.

2001PedNSS Table 6E, 6D

#### **Overweight Trends**

The trend is toward an increased prevalence of overweight nationally (1.5% increase since 1997, rising to 13.1% in 2001) and in West Virginia (1% increase since 1997, or a prevalence of 10.4% in 2001). There are no Healthy People 2010 goals for reducing overweight among children younger than five years of age. Objective 19.3 calls for a target prevalence of 5% among children aged six to 11. <sup>5</sup>

#### Ethnic variation in Overweight Prevalence

White children and Black children have about the same rates of overweight in West Virginia (10.3 and 11.2 respectively) and nationally (10.9% and 11.6% respectively). Hispanics and American Indians have the highest prevalence, but have few numbers in West Virginia. Comparing only White and Black prevalence of overweight puts West Virginia slightly below the national prevalence.

# Trends in Prevalence of Overweight\*

among children aged 2 to < 5 years



5% of children are expected to fall above the 95th percentile.

2001 WV PedNSS Table 18C

# Prevalence of Overweight\*

among children aged < 5 years, by Race and Ethnicity





2001 PedNSS Table 8C, 8D

#### Low Birth Weight

Low birth weight is defined as a birth weight under 2500 grams (5 pounds, 8 ounces). Low birth weight reflects maternal health status during pregnancy, and is a strong predictor of growth in early childhood.

#### Low Birth Weight Trends

The rate of low birth weight reported in West Virginia PedNSS shows increases each year until 1998-99, when a cumulative decrease of half a percentage point occurred. The trend toward increasing low birth weight rates each year resumed in 2000, and currently stands at 9.2%, contrasted with the national PedNSS rate of 9.0% in 2001. The West Virginia Vital Statistics report for all state births in 2000 shows the general population has a low birth weight rate of 8.4% <sup>4</sup>

Ethnic variation in Low Birth Weight Prevalence

Racial and ethnic differences in low birth weight prevalence in PedNSS are marked, both in the year 2001, and when averaged over the years represented in the trend chart above. The rate is higher for black infants than for white infants in West Virginia, as well as nationally.

### Trends in Prevalence of Low Birthweight\* among children aged < 5 years, by Race and Ethnicity



<2500 grams, among infants born during the reporting period.</p>

Year 2010 target: reduce low birthweight to 5% of live births.

2001 PedNSS Table 18C, 18D

### Prevalence of Low Birthweight\* by Race and Ethnicity



\*\* Reduce low birthweight to 5% of live births.

2001 WV PedNSS Table 8C

#### Anemia

Anemia is defined as the 5th percentile cutoff based on the Second National Health and Nutrition Examination Survey (NHANES II) data. For children under 24 months of age, this is a hemoglobin measurement less than 11.0 grams per deciliter, and for children aged two to five years, 11.1 grams per deciliter.

While not all anemia is due to iron deficiency, it is the most common cause of anemia throughout the world.<sup>8</sup> Iron deficiency anemia impairs mental and psychomotor development in infants and children. Iron deficiency anemia is seen most commonly in children six months to three years of age. Those at highest risk are low birth weight infants after two months of age, breastfed infants who receive no supplemental iron after four months of age, and formula-fed infants who are not consuming iron-fortified formula.<sup>8</sup>

Since 1993, West Virginia has consistently been among the three lowest in prevalence of low hemoglobin measurements for states reporting hemoglobin, reporting prevalences roughly half of the national prevalence, over all age groups and racial and ethnic groups. The 2001 national prevalence stands at 13.3%, while in West Virginia PedNSS, prevalence is 6.2%

Anemia is strongly associated with ethnicity - in 2001, nationally, more than 19% of Black children in PedNSS are anemic, as compared to about 10% of White children. This racial/ethnic association is present in West Virginia PedNSS as well, albeit at lower prevalence, 5.8% for White children and 12.4% for Black children. Healthy People 2010, Objective 19-12, seeks to reduce iron deficiency anemia to less than five percent among children aged one through two years of age, and among children three to four years of age to one percent.

# Prevalence of anemia\*

among children aged < 5 years, by age



\* Hb or Hct < 5th percentile, CDC MMWR vol. 47 (No. RR-3), 1998.

2001 PedNSS Table 21C, 21D

# Trends in Prevalence of anemia\* among children aged < 5 years, by Race and Ethnicity



\* Hb or Hct < 5th percentile, CDC MMWR vol. 47 (No. RR-3), 1998.

2001 PedNSS Table 18C, 18D

### Breastfeeding

One of the major initiatives of the WIC program is to increase breastfeeding of infants and to prolong the duration of breastfeeding. Healthy People 2010, Objective 16-19, sets a goal to increase to at least 75% the proportion of mothers who breastfeed their babies in the early postpartum period (initiation), and to at least 50% the proportion who continue breastfeeding until their babies are five to six months old (duration).

PedNSS data on breastfeeding rates for infants shows that both the nation and West Virginia fall short of these goals, with West Virginia initiation rates about 80% of the national rate, but falling behind in duration, at 75% of the national rate. Only about 15% of those initiating breastfeeding in West Virginia continue through six months of age, compared to 20% of those initiating breastfeeding nationally.

### Percentage of infants ever breastfed\* by Race and Ethnicity



\* Among infants born during the reporting period. \*\*Increase the proportion of mothers who breastfeed their babies in the early postpartum period to 75%. 2001 PedNSS Table 9C, 9D

# Percentage of infants breastfed at least 6 months\* by Race and Ethnicity



\* Among infants who turned 6 months of age during the reporting period. \*\* Year 2010 target: increase the proportion of mothers who breastfeed their babies at 6 months to 50%.

2001 PedNSS Table 9C. 9D

Health and Nutrition Risk Indicators Pregnant and Postpartum Women

#### **Prenatal Care**

The quality, quantity, and timing of prenatal care influence pregnancy outcomes. Inadequate care substantially increases a woman's risk for poor pregnancy course and outcome. The Healthy People 2010 national health objectives call for 90% of pregnant women to initiate prenatal care in the first trimester.<sup>5</sup>

For women for whom PNSS contained a pregnancy record, 85% reported having begun prenatal care in the first trimester, 8% in the second trimester, and 1% in the third trimester. Five percent reported no prenatal care. For all births nationally in 2001, 83.4% of women began prenatal care in the first trimester, but only 1.1% report no prenatal care. <sup>3</sup>

# **Entry into WIC Program**

Dietary intake and prenatal weight gain are better for women who enroll in the WIC program than for those who do not. <sup>9,10</sup> Participants are more likely than nonparticipants to receive prenatal care early and their infants are less likely to be premature and low birth weight. All benefits are most apparent for women who enroll early in pregnancy. <sup>9,10</sup>

Nearly 40% of women in the 2001 West Virginia PNSS enrolled in the WIC program during their first trimester, 28% in their second trimester, and about 16% each in the third trimester or after delivery. Patterns of enrollment also varied by region, from a high of 51% enrolling in the first trimester in Central WIC Local Agency, to a low of 28% in Shenandoah WIC Local Agency.

# Entry into prenatal care\* By Race and Ethnicity



\*\* 90% initiate prenatal care in the first trimester

2001 PNSS Table 3

# Entry into WIC Program by Trimester of Pregnancy



### **Prepregnancy Weight Status**

Prepregnancy weight is a major determinant of infant birth weight. A strong association has been found between prepregnancy underweight and having a low birth weight baby.<sup>11</sup> Overweight women are at increased risk for pregnancy-induced hypertension and gestational diabetes. These women are also more likely to deliver by cesarean section and to have a high birth weight infant.<sup>12</sup>

A body mass index (BMI) was calculated for each woman in the 2001 PNSS. BMI was based on measured height, and prepregnancy weight was self-reported. Women were classified by the Institute of Medicine's BMI categories: underweight, <19.8; normal weight, 19.8-26.0; overweight, 26.1-29.0; very overweight, >29.0.<sup>13</sup>

Sixteen percent of women in the 2001 West Virginia PNSS were underweight, 40% were normal weight, and 44% were overweight or very overweight. Rates of overweight ranged from 46% for women in Central WIC Local Agency to 39% in Wheeling-Ohio WIC Local Agency.

The 2010 objectives for adults aged 20 and over sets a target of no more than 15% for obesity (BMI >30); in the West Virginia 2001 PNSS, 31.5% of women are very overweight (BMI > 29). Trends of increasing mean BMI among women in the United States have been reported.<sup>14,15</sup> The percentage of women in each weight category in the West Virginia PNSS varied by ethnicity and age. Women who were white or under 20 years of age were more likely to be underweight. Women who were black or over 29 years of age were more likely to be overweight.

# Prepregnancy Weight as self-reported by participant



# Trends in Prevalence of Prepregnancy Overweight\* among West Virginia WIC Participants



\*\* Year 2010 objective 19-2: reduce obesity (BMI >30) to 15% of adults age 20 and over 1993 -2001 PNSS Tables 1C, 1D

# **Gestational Weight Gain**

The Institute of Medicine recommends prenatal weight gain as follows: 28-40 pounds for underweight women, 25-35 pounds for women of normal weight, and 15-25 pounds for overweight women.<sup>13</sup>

Women who gain less than ideal weight during pregnancy are at increased risk for preterm birth and delivery of a low birth weight infant;<sup>16</sup> 20% of women in 2001 West Virginia PNSS gained less than ideal weight. Women who gain more than ideal weight are at increased risk for delivery of a high birth weight infant, and may also have a difficult delivery and difficulty returning to their prepregnancy weight after delivery <sup>13</sup>) ; 31% of women in 2001 West Virginia PNSS gained more than ideal weight. The national PNSS population displayed the same proportion of women gaining more than the ideal amount, but 25% gaining less than the ideal amount.

White women were likely to gain more weight than recommended. Women in the older age groups were more likely than younger women not to gain adequate weight.

About 69% of women in the 2001 West Virginia PNSS gained the minimum amount, or more. For Healthy People 2010, this is a developmental objective, with no target figure set. <sup>5</sup>

# Ideal Weight Gain During Pregnancy based on Prepregnancy Weight



#### Anemia

Anemia, defined by a low hemoglobin (Hgb) level, is an indicator of iron deficiency. The CDC reference criteria for anemia during pregnancy are as follows: first trimester, Hgb <11.0 g/dL second trimester, Hgb <10.5 g/dL; third trimester, Hgb <11.0 g/dL.<sup>17</sup> The most common nutritional deficiency during pregnancy is iron deficiency. 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 birth weight infant.<sup>18</sup>

In the 2001 West Virginia PNSS, without regard to race, 2.9% and 5.1% of women had anemia in the first and second trimesters, respectively. Substantially more women (22.4%) had anemia in the third trimester. Overall, however, in all trimesters of pregnancy, the rate of anemia was higher among Black mothers than for women of other racial or ethnic groups.

The Third National Health and Nutrition Examination Survey (NHANES III) found that iron deficiency is more common among women who are of racial or ethnic minority groups, are poor, have less than a high school education, or who have had two or three prior pregnancies. <sup>19</sup> Most women in the PNSS meet one or more of these criteria. No change in the prevalence of iron deficiency or iron deficiency anemia among young women is evident in NHANES data for the past 18 years. <sup>20</sup>

# Prevalence of Anemia\* in Pregnancy by race and ethnicity



\* Based on CDC recommendations

2001 WV PNSS Table 5A

#### **Tobacco Use**

Infants born to women who smoke during pregnancy have lower average birth weight (difference about 250 grams). The difference in weight increases with the amount smoked.<sup>21</sup> Maternal smoking doubles the risk for sudden infant death syndrome and increases the risk for spontaneous abortion.<sup>22</sup> An association between smoking and premature delivery has been made by some studies, but the effect is variable according to maternal characteristics, such as older maternal age.<sup>23</sup>

About 52% of women in the 2001 West Virginia PNSS reported smoking before pregnancy, and 36% report smoking during pregnancy. By comparison, about 31% of PNSS women in all states participating in the system reported smoking before pregnancy, and 20% during pregnancy. For all births in the nation, approximately 12% of women report smoking during pregnancy. <sup>3</sup>

Since 1995, the prevalence of smoking during pregnancy has increased 2.2% in West Virginia PNSS, to 35.7% in 2001.

The 2010 objectives call for the rate of abstinence during pregnancy to increase to 98%.<sup>5</sup>

# Smoking during Pregnancy



\*\* Year 2010 objective 16-17: reduce smoking among pregnant women to 2% or lower 2001 PNSS Table 1E

#### 40 35.7 34.6 35.1 33.5 34.2 34.1 34.5 35 30 Percentage 22.7 22.8 22.7 25 22.7 22.4 19.7 20.0 20 15 10 5 0 1995 1996 1997 1998 1999 2000 2001 Year West Virginia Nation

# Trends in Smoking during Pregnancy\*

\* smoking of any amount during pregnancy

2001 PNSS Table 1C, 1D

### **Smoking Demographics**

In the 2001 West Virginia PNSS, the highest prevalence of selfreported smoking during pregnancy was found among white women, teenagers, women with less than a high school education, and unmarried women.

The slight increase in overall smoking prevalence during pregnancy for West Virginia PNSS is not attributable to one single demographic group, but similar to national trends in the general population, <sup>3</sup> older teenagers have the largest increase; from 32.0 in 1995 to 39.2 in 2001.

# Smoking Demographics among pregnant women in PNSS



2001 PNSS Table 7

**Birth Outcomes** 

# WIC Participation during Pregnancy

Birth outcomes are slightly more positive for an infant whose mother participated in WIC during pregnancy. In 2001, 1.7% fewer low birth weight infants were born to mothers who participated in WIC while pregnant, as compared to women who participated in WIC, but only after delivery. This 1.7% reduction in the number of low birth weight births represents 182 infants.

# **High Birth weight**

High birth weight (>4,000 g) can increase an infant's risk for obstetric injury. <sup>24</sup> One study suggests that high birth weight infants are likely to be taller and heavier than other children throughout childhood. <sup>25</sup> Several studies have associated high birth weight with subsequent obesity in children and adults; however, a strong correlation of subsequent obesity with maternal BMI has been reported. <sup>26-28</sup> In the 2001 West Virginia PNSS, 8.2% of infants were of high birth weight, compared to 7.9% of infants born to PNSS women in all states participating in the system. High birth weight infants were more likely to be born to mothers older than 29 years of age, those with more than a high school education, or those having 42 or more weeks of gestation.

# Infant Birth Weight by WIC Participation during Pregnancy



# Low Birth weight by Maternal Factors

In the 2001 West Virginia PNSS, 9.2% of infants were low birth weight, of which 1.2% were very low birth weight (<1,500 g). The low birth weight rate ranged from about 6% in Central to around 10% in TSN, Monongalia, and Valley Local Agencies.

The low birth weight rate for infants born to PNSS mothers in all states participating in the system in 2001 was 8.4%, with 1.1% of low birth weight infants being very low birth weight. A Healthy People 2010 national health objective seeks to reduce the incidence of low birth weight to no more than 5% of all live births and very low birth weight to no more than 0.9%. <sup>5</sup> No region in West Virginia in the 2001 PNSS met the objective for low birth weight. However, the objective related to very low birth weight was almost achieved statewide.

#### Demographic Factors Associated with Low Birth weight

Characteristics such as race or ethnicity, age, marital status, and income are associated with low birth weight. <sup>3</sup> Black women, older women, and women with less than a high school education are more likely to have a low birth weight infant. The risks for low birth weight are widely distributed throughout the population, and a substantial number of low birth weight infants will continue to be born to women not considered at high risk.

# Low Birthweight by Region



\*\* Year 2010 objective 16-10. Reduce low birth weight (LBW) and very low birth weight (VLBW). 2001 PNSS Table 1E

# Prevalence of Low Birthweight\* by Mother's Demographics



\* < 2500 grams, among infants born during the reporting period.</p>

\*\* Reduce low birthweight to 5% of live births.

# Nutrition and Behavioral Factors Associated with Low Birth weight

Risk factors for delivering a low birth weight infant include prepregnancy underweight and gaining less weight than recommended during pregnancy. <sup>13</sup> In the 2001 West Virginia PNSS, 11.9% of underweight women delivered low birth weight infants, and 13.6% of women who did not gain adequate weight during pregnancy delivered low birth weight infants.

Women who have multiple risk factors are of greatest concern. For example, the incidence of delivering a low birth weight infant was much higher for underweight women who smoked (15.3%) than for normal weight women who do not smoke (4.8%)

# Infant Birth Weight

by Mother's Weight Gain during Pregnancy



2001 WV PNSS Table 17

# Infant Birth Weight

by Mother's Prepregnancy Weight Status and Smoking



#### Prematurity

Nutritional problems of premature infants include immature sucking and swallowing, digestion and absorption, and small gastric capacity. In the 2001 West Virginia PNSS, using records only from mothers who participated in WIC both prenatally and postpartum and excluding multiple births, almost 9% of infants were born preterm (prior to 37 weeks gestation). In PNSS nationally, the prevalence is 8% in 2001. These infants were ten times more likely to be low birth weight than were infants born at term.

The causes of preterm delivery are not yet well understood, and meaningful reduction in preterm rates may be unlikely until effective prevention methods are developed.<sup>3</sup>

# Low Birthweight Infants

by weeks of gestation



#### End Notes

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