West Virginia

Pediatric Nutrition Surveillance

1999 Summary

West Virginia Department of Health and Human Services
Bureau for Public Health
Office of Nutrition Services

This report summarizes selected indices of nutritional status, received from every regional WIC Program in West Virginia, as contributors to a program of nutrition surveillance in West Virginia.

State of West Virginia
Bob Wise, Governor

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PEDIATRIC NUTRITION SURVEILLANCE SUMMARY
(PedNSS)

1999 ANNUAL SUMMARY

Overview

The Pediatric Nutrition Surveillance System (PedNSS) monitors the prevalence of specific health indicators of nutrition risk in low-income infants, children and adolescents. Surveillance is a continuous process, allowing for the evaluation of health indicators for this population over time. This data is used to supply information for planning health priorities and policies, and guiding, improving and supporting decisions regarding nutrition interventions at the state and local levels.

The Centers for Disease Control and Prevention (CDC) has been collecting PedNSS data since 1973. Currently, forty-seven states, Indian Reservations, and Territories participate in contributing data to PedNSS. The information is collected nationwide from a variety of food assistance and public health and nutrition programs, such as Health Check, Title V Maternal and Child Health Program (MCH) and the Head Start Program. The majority of the national data (three quarters) is generated by the Special Supplemental Nutrition Program for Women, Infants and Children (WIC). All information in West Virginia PedNSS originates from measurements and information collected at WIC clinics. West Virginia has been participating in PedNSS since 1992.

Information collected by PedNSS includes population demographics and data that reflect health and growth problems in children. Nutrition risk indicators collected in PedNSS are short stature (low height-for-age), underweight (low weight-for-height), overweight (high weight-for-height), anemia (low hemoglobin) and low birth weight (<2500 grams). The measurements are interpreted by the computer software version of the National Center for Health Statistics (NCHS)/CDC growth reference.[1] Additionally, infant feeding practices data is collected for children under two, to assess the prevalence and duration of breastfeeding. National PedNSS information, West Virginia statewide data, and regional summary data are presented in this report.

Data Collection and Data Quality

A record in PedNSS is generated for each visit by a child when height, weight or hemoglobin is recorded in the WIC database (STORC). A child with more than one visit will have multiple records in the system. In West Virginia, data collected by local WIC clinic staff and keyed into the STORC data system is processed quarterly by state staff and forwarded to the CDC, which analyzes the data for the completeness and accuracy required to include that data in the data

set. The inclusion of as many records as possible is desirable, as the larger the population, the more indicative the measurement is of a true prevalence rate. The 1999 West Virginia PedNSS consists of 97,461 records. For analysis purposes, the CDC requires that a sub-group have at least 100 records containing the data under analysis to meet standards of reliability. In this report, those groups having less than 100 records are indicated with an asterisk, not charted, or otherwise noted in text.

A record that is incomplete for a given data item or contains a biologically implausible value will not be included in the prevalence calculation for that item. In order for a record to be considered complete, it must contain the child's height and weight measurement, birth weight for children under two years of age, and hemoglobin or hematocrit. In 1999, West Virginia had 72.8% of records considered complete - with the majority of unreported data being hemoglobin measurements. This is because the WIC Program does not require blood work at every visit.

The CDC also will not include those items in records which are identified as biologically implausible values, a value which exceeds edits set by the CDC. This cutoff is at 3.09 SD. The probability that values which exceed the edit are correct is one in a thousand.[2] For example, if a record contains an extremely high weight value that exceeds the CDC's edits, then this record's weight is not used in determining the prevalence of high weight for height. This does not prevent the use of this record's hemoglobin value (if it is within edits) for determining anemia prevalence. Nationally, 5.8% of 1999 PedNSS records contained biologically implausible values. West Virginia's 1999 PedNSS records contained 1.9% rejected for implausible values, with three-quarters of these records rejected due to the child's weight measurement being above edits. Further, the major source of these implausibly high values for weight are measurements taken on children more than two years of age.

Data Interpretation

This report encompasses West Virginia PedNSS data from 1992 through 1999. Through 1994, the source of data was an essentially unedited database. Beginning with 1995, data originates from the WIC database, STORC, which contains field edits on anthropometric, hematologic and other critical values. Alterations in some of the trends in overall state rates beginning in 1995 may reflect the effect of changed edits within the STORC system.

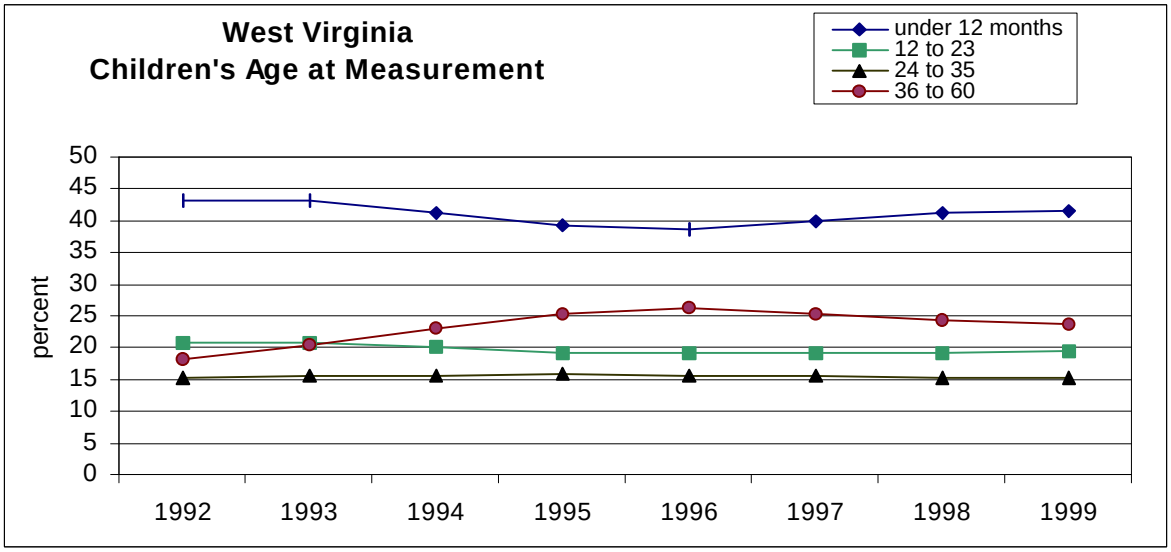
Caution is warranted when applying information obtained from PedNSS data to the general population. Nationally, PedNSS data represents participants in a variety of public health programs serving low income individuals. In West Virginia, the PedNSS surveillance group is composed entirely of WIC participants, and the WIC Program has as one of its primary eligibility requirements the existence of nutrition risk factors. Therefore, higher than normal prevalence of low birth weight, anemia, and abnormal values for weight and height are to be expected. Keep in mind that PedNSS data is not collected from identical populations between states or even clinics, and data can be affected by the population's age, ethnicity or income status. In clinics serving smaller numbers, the addition of just a few visits by children with unusually high or low values can skew the clinic prevalence for a given year. An established trend of rising, falling or consistently high or low values is more revealing.

Demographics

Children's Age Distribution at Measurement

WIC is offered nationwide to children from birth through their fifth birthday. Nutrition risk factors vary with age groups, so the proportion of children in each group to the total population is of interest. West Virginia statistics mirror national statistics, and over the past decade, little change has occurred.

The middle two age groups, 12 months to 23 months, and 24 to 36 months, are extremely stable; in West Virginia, the change in distribution in these middle age groups totals 1.5% for both age groups combined between 1992 and 1999.



The two age groups most prone to fluctuation are at the beginning and end of WIC Program coverage - that is, infants and those children after their third birthday.

Children's 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. White participation decreased by 2.2%, and black population increased by 0.9%.

	1992	1993	1994	1995	1996	1997	1998	1999
White	94.7%	94.6%	94.3%	93.1%	93.1%	92.9%	92.8%	92.5%
Black	4.8%	4.8%	5.1%	5.7%	5.7%	5.8%	5.8%	5.7%
Hispanic	0.2%	0.3%	0.3%	0.3%	0.4%	0.3%	0.3%	0.4%
ALL OTHERS*	0.2%	0.3%	0.3%	0.7%	0.9%	0.9%	1.1%	1.4%

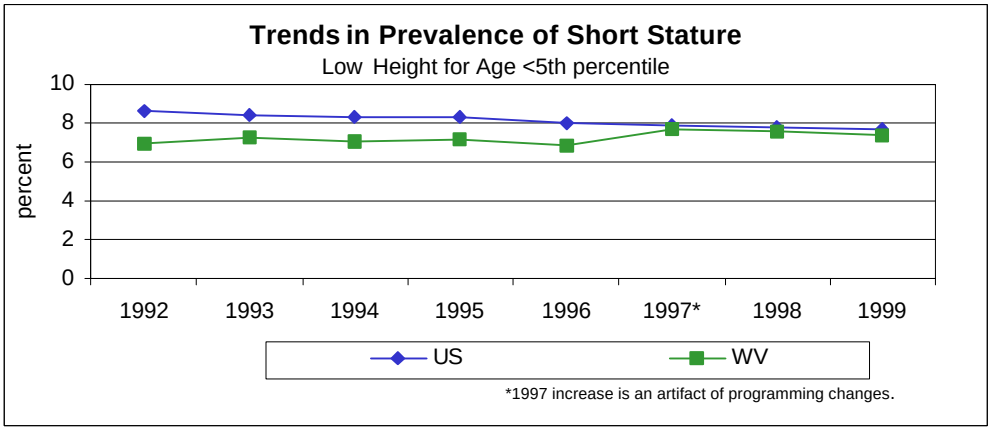
*The category "all others" includes unknown race and unspecified race in PedNSS.

This distribution is consistent with the 1990 Census racial distribution in the general West Virginia population.

Anthropometric Indices

Short Stature

Low height-for-age, also referred to as shortness or stunting, is defined as a height-for-age value below the 5th percentile of the NCHS/CDC height reference. It is expected that five percent of a normal population will fall in this low height-for-age category. Stunting reflects the long term health and nutrition history of a child. On an individual level, shortness can reflect the normal variation of growth within a population. In some children, short stature is related to factors such as lower birth weight or short parental stature. Other contributing factors to growth stunting can be frequent infections and long term poor nutrition.[3] Short stature has been associated with low developmental and cognitive test scores, and stunting early in life may lead to reduced physical capacity and endurance in adulthood.[4] On a population level, the CDC finds a strong correlation between an increased prevalence of stunting and poor socio-economic conditions. Black, Hispanic and Asian children are more likely to be short than other children.[5] The low income population reflected in PedNSS shows a persistent rate of low height-for-age in excess of five percent.



The national rate of short stature in PedNSS is similar to last year, at 7.7%. West Virginia PedNSS rates declined two-tenths of a percentage point, from 7.6% in 1998 to 7.4% in 1999. When low birth weight infants less than six months old are excluded, the national rates fall one point to 6.7% in 1999. West Virginia data also shows a reduction, at 5.8% in 1999.

Ethnically, the major groups in West Virginia display the same characteristics as national populations. The following table shows 1999 data. This data does include low birth weight children, and demonstrates how children born with a low birth weight tend to catch up with their peers.

Short Stature by Age and Ethnic Group
1999 PedNSS

	US			WV		
	< 1 Yr	1 Yr	2-4Yrs	< 1 Yr	1 Yr	2-4Yrs
White	10.5%	8.6%	5.5%	9.4%	8.0%	4.8%
Black	15.1%	9.9%	4.2%	12.7%	9.1%	2.4%
Hispanic	7.4%	8.1%	4.8%	15.0%	*	11.7%
ALL**	10.4%	8.8%	5.1%	10.1%	7.8%	11.2%

**Groups having < 100 records in WV PedNSS not listed separately *indicates less than 100 records

Low Weight-for-Age (under the 5th percentile of the NCHS reference population) is regarded by the CDC PedNSS system as a less useful index in defining nutritional status. In populations with few children with low weight-for-height, weight-for-age provides the same information as height-for-age. Weight-for-age is a more useful tool in individual assessments, with serial followup, than as a population measure.[6] The PedNSS system does not break out age categories for low weight-for-age, but a comparison of overall prevalence in West Virginia between 1998 and 1999 shows no change, at 5.7%. National PedNSS rates were unchanged as well, at 4.8%.

Underweight

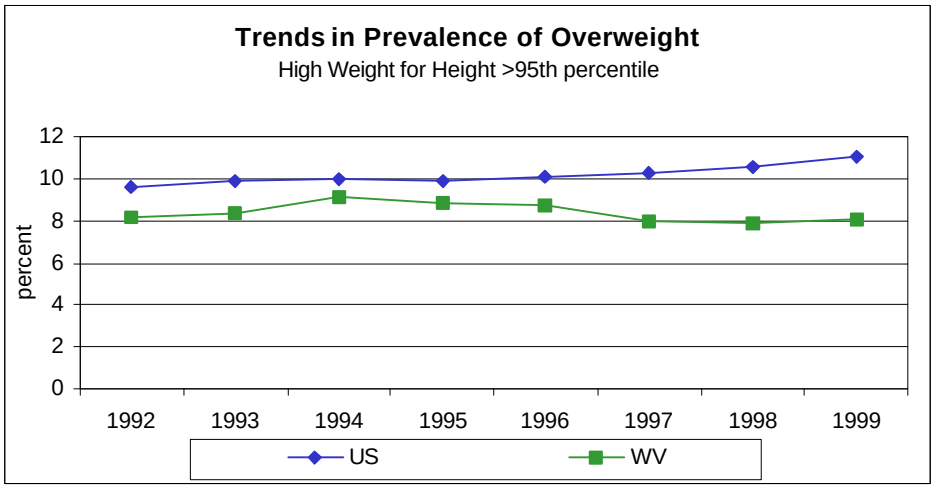
Children with a weight-for-height value of less than the 5th percentile of NCHS/CDC reference population are considered to be underweight. According to the CDC, low weight-for-height, or thinness, is often associated with recent severe disease, but can also be the result of normal individual variation in a population. In developing countries, thinness indicates acute malnutrition (either the result of insufficient food, infectious or diarrheal disease, or both.) The prevalence of thinness in a population is usually low except during disaster conditions. [7] Low weight-for-height is generally not a problem in the United States, and no Healthy People 2000 goals were established.

Underweight by Age Group
1999 PedNSS

	US	WV
< 1 Yr	3.1%	2.8%
1 Yr	2.9%	3.5%
2-4Yrs	1.8%	1.8%
ALL	2.6%	2.5%

Overweight

High weight-for-height is defined as those children in the 95th percentile and above of the NCHS/CDC reference. This index is used as a proxy for obesity, and in the pediatric population has become an important public health issue. One-third to one-half of those children above the 95th percentile will become obese adults. Obesity is associated with long term health consequences such as heart disease, hypertension and diabetes.[8] Nationwide, the percentage of children found above the 95th percentile of weight for height continues to climb, with a 1999 overall prevalence of 11.0% . West Virginia's high weight-for-height rate has increased two-tenths of a percentage point in the last year, to 8.1%.



Age and ethnicity show correlations in the prevalence of overweight. The following table contrasts national rates with West Virginia rates.

Overweight by Age and Ethnic Group
1999 PedNSS

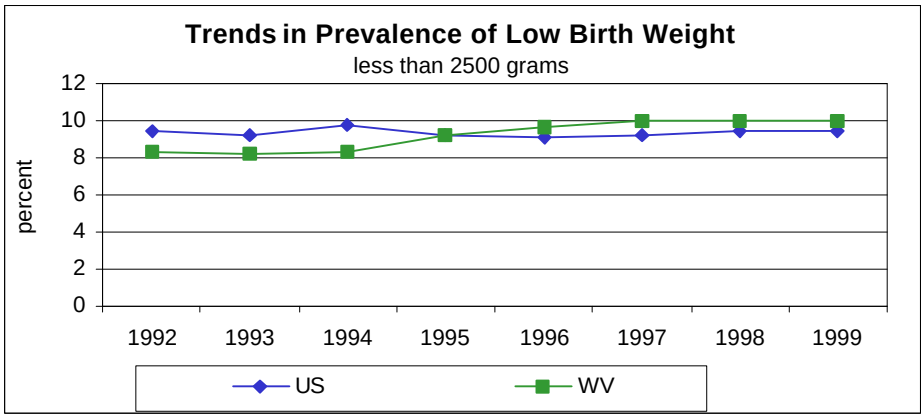
	US			WV		
	< 1 Yr	1 Yr	2-4Yrs	< 1 Yr	1 Yr	2-4Yrs
White	7.9%	12.2%	7.9%	6.2%	11.2%	8.2%
Black	8.9%	13.8%	8.4%	9.4%	13.3%	9.5%
Hispanic	12.4%	17.5%	12.9%	*	*	12.3%
ALL**	9.7%	14.1%	9.5%	6.3%	11.3%	8.3%

**Groups having < 100 records in WV PedNSS not listed separately. *indicates less than 100 records

The noticeable increase in prevalence of overweight in West Virginia in the one year to two year age group parallels national PedNSS data. This phenomena is present in data representative of the general population as well. According to researchers, it is unclear whether this increase is a reflection of an overweight problem, or an artifact of the NCHS growth charts. The same study found that between 1971 and 1994, the prevalence of overweight has not changed among children aged one through three years, but has increased in the four and five year age groups. [9] The new Pediatric Growth reference, when applied to the PedNSS population, may eliminate this apparent difference.

Low Birth Weight

Low birth weight infants and children continue to constitute a growing segment of the PedNSS population. Healthy People 2000, Objective 14.5 sought to reduce low birth weight to no more than five percent of live births, and established a special population target for African-Americans at nine percent. Low birth weight is defined as a birth weight under 2500 grams (5 pounds, 8 ounces). Low birth weight occurs when an infant is born at less than 37 weeks of age, when there is intrauterine growth retardation, or as a result of both conditions. Low birth weight reflects maternal health status during pregnancy, and is a strong predictor of growth in early childhood. Premature low birth weight infants have a higher mortality rate, but full-term infants small for their gestational age exhibit slower physical growth, possibly slower mental development, and are more likely to have congenital abnormalities.[10]



The rate of low birth weight reported in PedNSS increased until 1997 at 10.0%, and has shown no change in any year since. The West Virginia Vital Statistics reports for all state births, 1992 through1997, show increases each year until 1998, with a two-tenths of a percentage point decrease to 8.1%.[11] Trends from West Virginia PedNSS, and national data, are shown in the above chart.

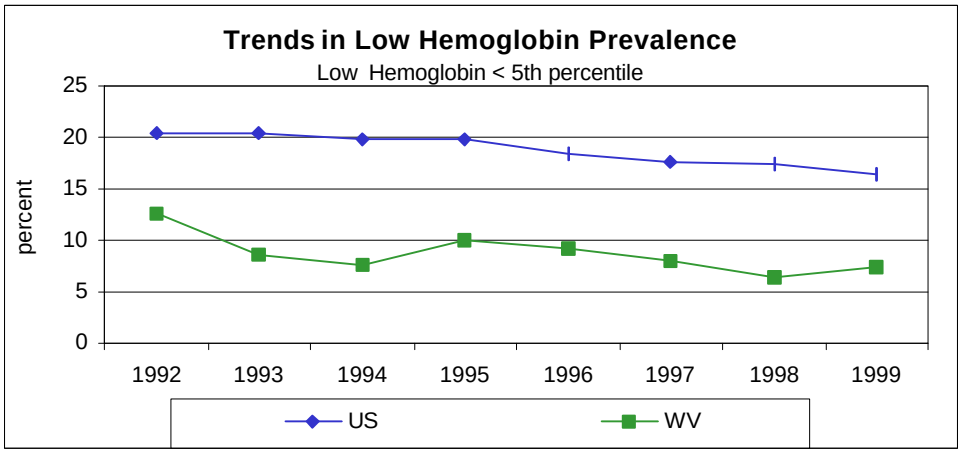
Low Birth Weight by Race
1999 PedNSS

	US	WV
White	8.6%	9.8%
Black	13.6%	13.7%
Hispanic	7.0%	5.9%
ALL	9.4%	10.0%

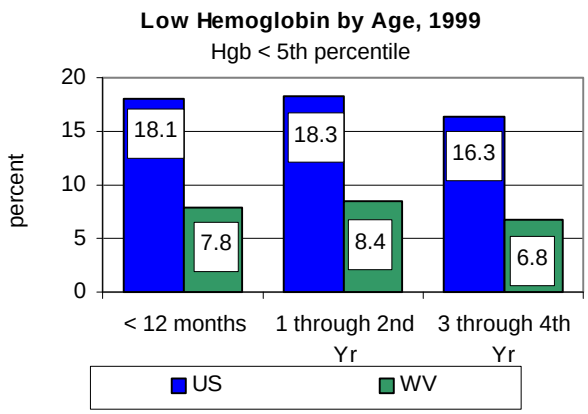
Similar to national statistics, West Virginia PedNSS demographic data reveals a higher rate of low birth weight among African Americans. Healthy People 2000 objectives have not been met among any category of the PedNSS population.

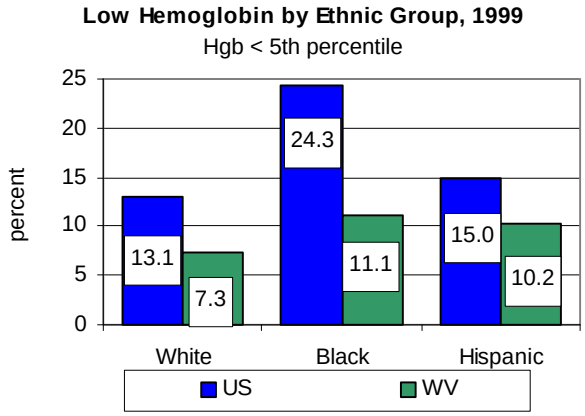
Anemia

The CDC has established criteria for anemia based on the Second National Health and Nutrition Examination Survey (NHANES II) data. For children under twenty-four months of age, the 5th percentile cutoff is hemoglobin measurement under 11.0 grams per deciliter, and for children aged two to five years, 11.1 grams per deciliter. PedNSS adjusts hematology values for altitude.[12] All data presented here are for hemoglobin only, as over 80% of national PedNSS measurements, and 99% of West Virginia PedNSS measurements are hemoglobin values. West Virginia PedNSS shows an increase in 1999, up one full percentage point to 7.5%. This figure is still less than half of the national rate, 16.5% in 1999. While not all anemia is due to iron deficiency, it is the most common cause of anemia throughout the world.[13] Iron deficiency anemia impairs mental and psychomotor development in infants and children. Although iron deficiency can be reversed with treatment, the reversibility of impairments are not yet clearly understood. 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. [14]



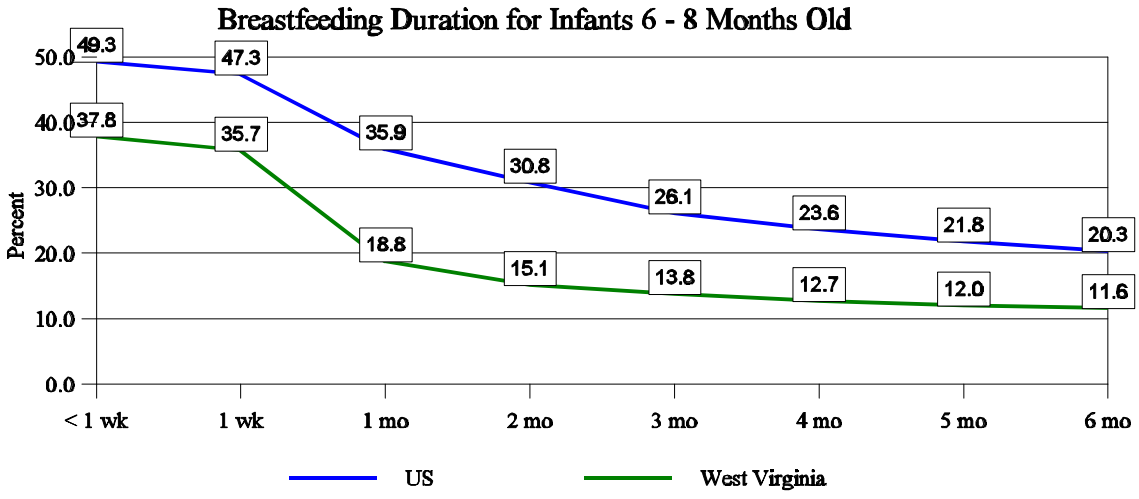
Healthy People 2000, Objective 2.10, was to reduce iron deficiency anemia to less than three percent among all children aged 1 through 4 years of age, and specifically targets two age groups among low-income children; those ages 1-2 years are targeted to reduce anemia rates to 10%, and children 3-4 years to 5%. Healthy People 2000 further defined iron deficiency as abnormal results from two or more of the following tests: mean corpuscular volume, erythrocyte protoporphyrin, or transferrin saturation.[15] While WIC clinics do not perform these tests, the CDC continues to recommend hemoglobin screening for anemia in populations where the risk of anemia due to iron deficiency is high. [16] Since 1993, West Virginia has consistently been among the three lowest in prevalence of low hemoglobin measurements for states reporting hemoglobin. Anemia is strongly associated with ethnicity - in 1999, nationally, more than 24% of black children in PedNSS are anemic, as compared to about 13% of white children. This racial/ethnic association is present in West Virginia PedNSS as well, albeit at lower prevalence.





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 2000, Objective 2.11, set 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 5 to 6 months old (duration). Special target populations are low income mothers, and Black, Hispanic and American Indian/Alaskan natives.

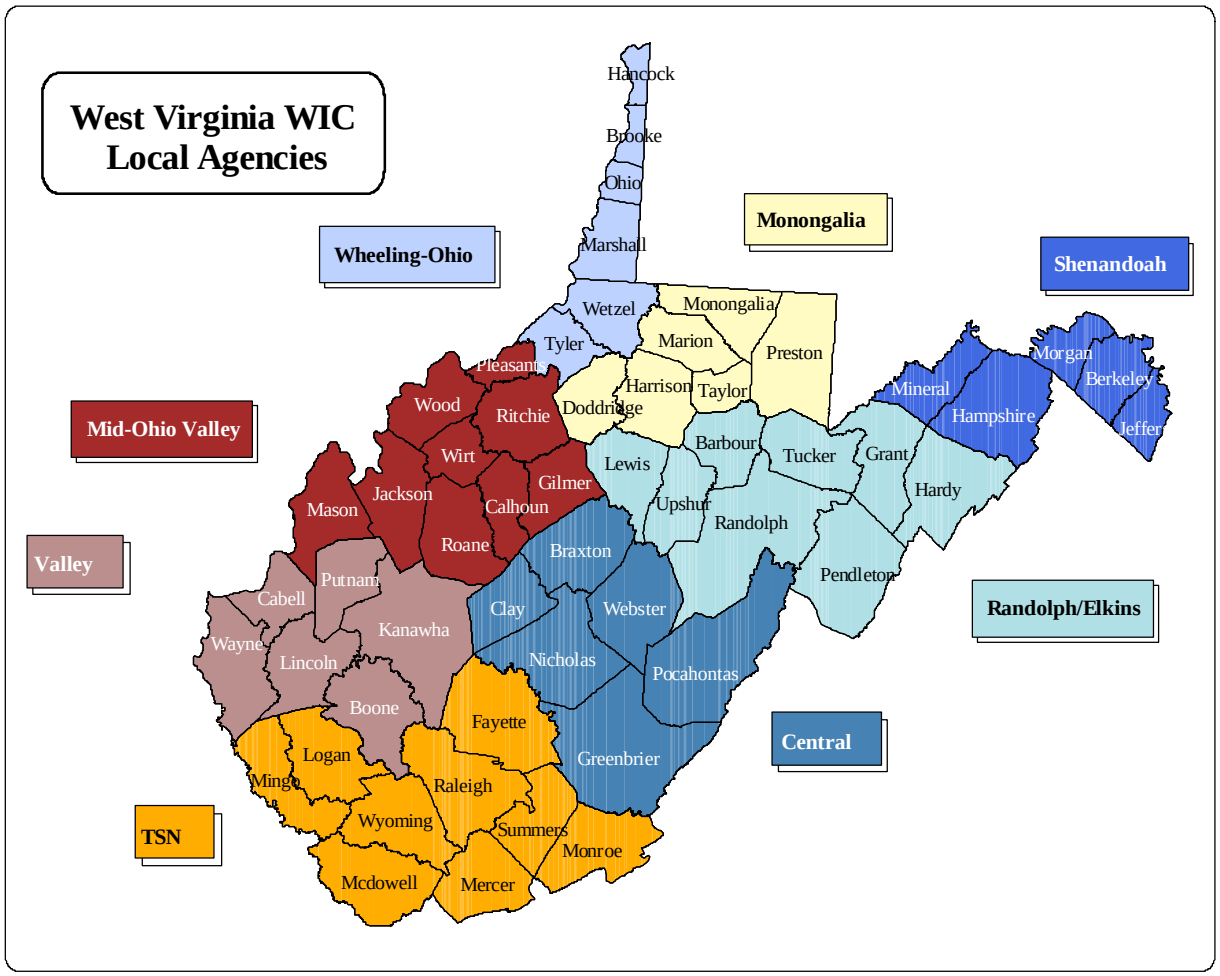


1999 PedNSS data on breastfeeding rates for infants six to eight months old shows that both the nation and West Virginia fall short of these goals, with West Virginia initiation rates about 77% of the national rate, but falling behind in duration. Only about 30% of those initiating breastfeeding in West Virginia continue through 6 months of age, compared to 41% of those initiating breastfeeding nationally. Similar to the national statistics, West Virginia shows the greatest drop off in rates between one week and one month of age.

WIC Local Agency Profiles

Because WIC is the sole contributor of PedNSS data in West Virginia, the administrative structure of that program is used to break data into regions. Each of the eight WIC Local Agencies in West Virginia have unique characteristics. Some serve primarily rural and small town areas, and others are within a short drive of major American cities. As nutrition indicators can vary by age or ethnicity, so do PedNSS populations within local areas.

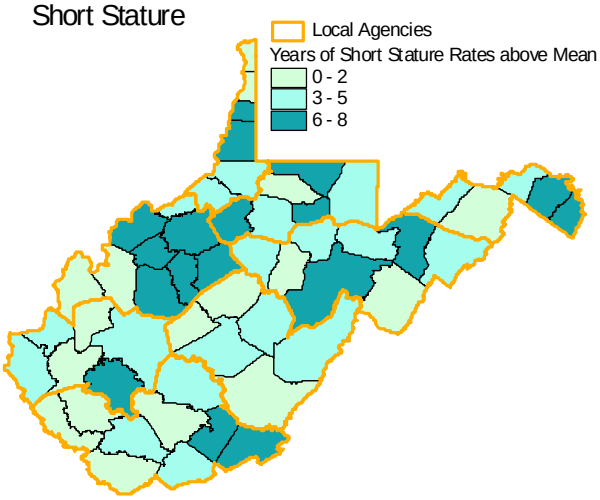
Each of the nutrition risk indicators for each county in West Virginia for all years of PedNSS have been compiled in this report**.** Not all records contain every indicator. Only those records with information on the specific indicator are accepted. Therefore, averages for the Local Agency may not agree with data for the individual counties included in the agency.



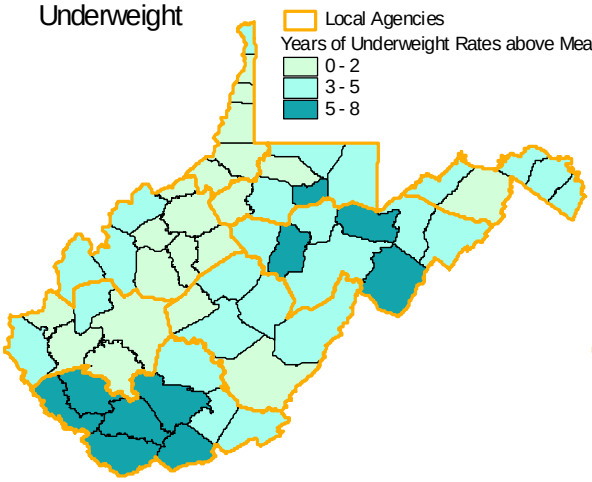
In the summaries that follow, each county's annual prevalence has been compared to the state-wide average for that year. The number of years - within the eight years of data available in West Virginia PedNSS - is indicated in the following maps. Data is presented here so that local nutrition agencies may better address needs endemic to their own clients and personnel.

These maps help visualize areas where rates have a tendency to be higher or lower than other areas in the State. The number of years out of the eight years PedNSS has collected data are summed for each county, for each nutrition risk indicator above the State mean. The administrative region for which each Local Agency is responsible is also indicated.

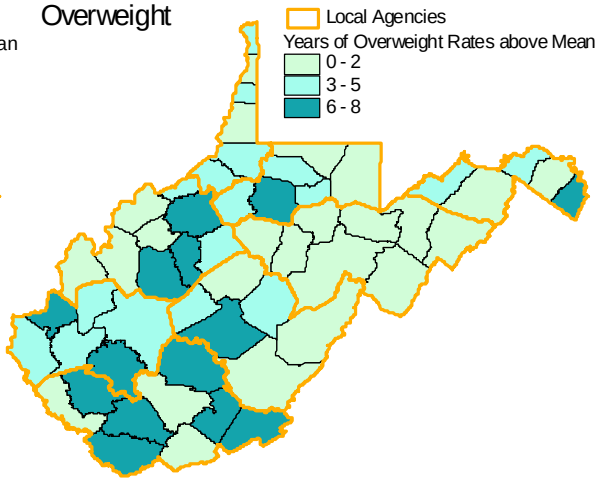
Short Stature



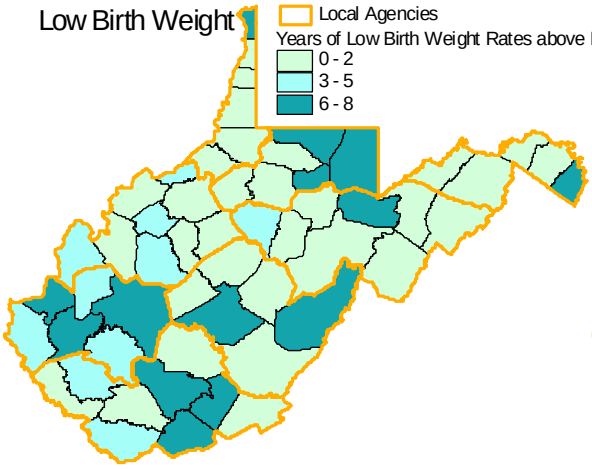
Underweight



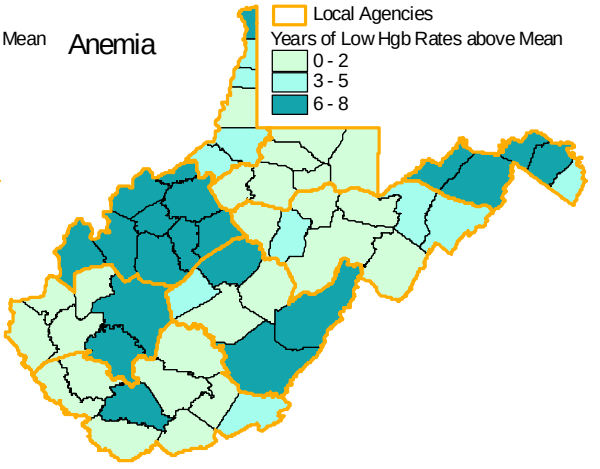
Overweight



Low Birth Weight



Anemia



Short Stature - Low Height for Age										Table 1
		1992	1993	1994	1995	1996	1997	1998	1999	Average
	US	8.6	8.4	8.3	8.3	8.0	7.9	7.8	7.7	8.1
	WV	7.0	7.3	7.1	7.2	6.8	7.7	7.6	7.4	7.3
LA	County	1992	1993	1994	1995	1996	1997	1998	1999	Average
1	Fayette	7.9	7.9	7.9	6.6	5.8	7.0	8.5	6.1	7.2
1	Logan	6.2	5.1	5.8	6.3	4.4	5.8	5.0	4.4	5.4
1	Mcdowell	4.9	4.6	6.1	6.2	6.3	9.1	8.9	6.6	6.6
1	Mercer	5.9	5.9	6.6	8.2	7.1	8.8	7.4	7.8	7.2
1	Mingo	5.0	4.1	4.5	5.7	5.1	3.8	3.9	6.3	4.8
1	Monroe	9.5	8.1	8.1	10.0	9.8	9.8	9.0	9.6	9.2
1	Raleigh	6.0	7.1	6.4	5.7	7.3	8.0	5.7	7.4	6.7
1	Summers	10.7	11.0	9.3	7.5	11.8	9.4	13.9	13.1	10.8
1	Wyoming	10.5	7.3	6.2	7.7	4.1	4.9	7.9	4.2	6.6
2	Braxton	6.8	7.1	5.2	4.2	2.9	3.6	4.9	5.5	5.0
2	Clay	6.8	6.5	5.0	5.9	5.7	7.5	5.8	6.0	6.2
2	Greenbrier	5.3	5.7	7.5	5.1	3.6	5.4	5.1	7.3	5.6
2	Nicholas	8.7	7.8	6.7	6.7	6.2	8.0	8.1	9.5	7.7
2	Pocahontas	6.2	6.1	7.7	8.0	7.6	7.7	8.7	5.9	7.2
2	Webster	6.0	5.3	7.2	7.4	9.5	7.0	8.2	7.9	7.3
3	Doddridge	5.5	9.9	4.9	8.9	9.2	9.9	7.8	10.3	8.3
3	Harrison	7.3	7.7	6.4	6.4	6.9	7.6	6.3	7.4	7.0
3	Marion	6.4	7.7	5.6	5.7	4.9	6.6	6.9	6.1	6.2
3	Monongalia	7.7	8.1	8.6	8.5	7.1	6.8	7.1	8.2	7.8
3	Preston	7.3	7.2	8.6	6.7	8.3	8.9	7.8	7.2	7.8
3	Taylor	6.4	8.3	9.3	8.6	10.8	10.1	10.5	8.3	9.0
5	Barbour	10.0	6.8	7.4	7.0	7.0	5.2	7.0	5.3	7.0
5	Grant	6.6	9.3	10.7	10.2	7.6	7.9	6.9	10.0	8.6
5	Hardy	6.4	7.4	6.7	7.6	8.7	7.2	8.9	5.4	7.3
5	Lewis	8.8	7.5	8.2	8.5	4.8	7.3	6.8	5.8	7.2
5	Pendleton	5.3	7.7	7.5	6.8	5.4	6.4	7.5	4.1	6.3
5	Randolph	4.8	5.2	7.2	9.0	9.6	11.9	10.7	10.2	8.6
5	Tucker	6.3	7.5	9.0	6.1	6.1	6.3	5.8	10.6	7.2
5	Upshur	7.6	7.5	6.4	7.2	5.3	5.6	6.2	6.1	6.5
6	Berkeley	8.0	7.9	5.9	8.2	8.1	8.3	9.0	9.6	8.1
6	Hampshire	6.4	7.2	7.9	7.2	7.0	7.2	6.1	4.6	6.7
6	Jefferson	7.0	9.3	8.9	8.6	9.0	7.4	15.6	18.1	10.5
6	Mineral	9.2	8.0	6.3	6.2	7.2	7.4	7.8	9.1	7.6
6	Morgan	8.2	6.5	9.3	8.1	5.5	8.2	5.4	5.9	7.1
8	Brooke	5.8	5.0	6.7	7.4	7.0	6.4	6.2	5.9	6.3
8	Hancock	8.4	5.9	4.2	4.4	6.8	6.4	5.6	4.5	5.8
8	Marshall	9.9	6.2	5.7	8.7	6.9	7.8	8.2	7.7	7.6
8	Ohio	7.3	9.6	8.6	8.9	10.6	10.1	8.5	6.1	8.7
8	Wetzel/Tyler	7.4	8.6	7.4	6.7	5.1	6.9	7.3	8.8	7.3
9	Calhoun	7.6	8.4	8.9	12.5	12.0	8.2	5.9	8.4	9.0
9	Gilmer	12.2	10.5	12.1	14.3	6.1	6.9	9.1	7.7	9.9
9	Jackson	6.0	7.7	7.0	5.6	4.3	6.5	7.1	7.3	6.4
9	Mason	4.9	5.3	4.4	5.8	5.1	6.2	5.0	4.8	5.2
9	Pleasants	7.2	9.2	9.3	7.2	6.4	7.2	7.6	6.4	7.6
9	Ritchie	13.0	13.7	9.2	8.2	8.8	12.4	14.0	8.7	11.0
9	Roane	7.9	8.5	6.7	9.5	10.2	10.3	11.0	9.4	9.2
9	Wirt	7.8	8.4	13.5	7.8	6.0	9.3	9.9	11.5	9.3
9	Wood	7.4	8.4	9.1	8.2	6.9	8.3	6.2	5.6	7.5
11	Boone	7.7	8.1	6.8	8.4	8.0	6.9	8.1	7.7	7.7
11	Cabell	7.5	7.2	7.1	6.5	5.5	9.2	9.5	10.0	7.8
11	Kanawha	5.7	6.9	6.8	7.1	7.9	8.9	8.0	7.2	7.3
11	Lincoln	5.4	7.2	5.5	3.7	6.8	7.9	8.5	6.5	6.4
11	Putnam	4.7	8.2	5.7	6.2	5.0	6.8	6.9	5.6	6.1
11	Wayne	7.0	8.6	8.7	7.5	6.7	4.8	6.7	5.5	6.9

Underweight - Low Weight for Height										Table 2
		1992	1993	1994	1995	1996	1997	1998	1999	Average
	US	3.1	3	2.7	2.6	2.6	2.5	2.4	2.4	2.7
	WV	2.8	2.9	2.4	2.4	2.4	2.7	2.6	2.5	2.6
LA	County	1992	1993	1994	1995	1996	1997	1998	1999	Average
1	Fayette	3.1	3.6	2.9	1.8	3.4	1.9	1.8	3.3	2.7
1	Logan	6.9	7.3	5.9	2.5	1.1	3.0	3.3	2.2	4.0
1	Mcdowell	5.0	5.1	3.1	3.1	2.4	3.0	2.6	2.8	3.4
1	Mercer	3.9	5.3	4.4	3.0	3.5	4.8	4.6	3.6	4.1
1	Mingo	5.6	5.9	5.4	2.3	4.7	4.8	4.8	2.7	4.5
1	Monroe	3.0	2.7	2.6	2.1	1.8	4.0	2.7	5.9	3.1
1	Raleigh	3.1	3.2	2.4	2.4	2.6	2.9	3.1	2.9	2.8
1	Summers	2.7	1.4	2.0	3.5	2.4	3.4	2.7	2.7	2.6
1	Wyoming	3.2	3.9	2.5	4.1	3.5	1.8	2.1	2.8	3.0
2	Braxton	3.3	2.3	1.2	2.5	3.2	1.4	3.2	1.9	2.4
2	Clay	1.4	1.8	0.6	1.2	1.8	1.7	1.4	2.0	1.5
2	Greenbrier	1.5	1.9	1.6	2.0	2.9	1.8	1.8	1.2	1.8
2	Nicholas	3.2	3.4	3.6	2.3	1.6	1.6	2.6	2.3	2.6
2	Pocahontas	1.3	1.9	3.3	5.7	3.4	1.4	1.6	1.8	2.6
2	Webster	3.1	3.1	2.1	1.6	2.7	1.4	2.0	2.0	2.2
3	Doddridge	0.4	2.0	1.1	0.5	0.9	1.6	1.3	4.2	1.5
3	Harrison	1.5	2.3	2.5	2.0	2.9	3.7	2.1	2.3	2.4
3	Marion	2.8	1.8	1.8	1.4	1.2	2.0	1.9	1.6	1.8
3	Monongalia	4.1	2.3	2.4	2.4	2.9	2.8	3.0	2.5	2.8
3	Preston	2.4	2.2	1.4	2.0	4.2	4.9	4.6	5.5	3.4
3	Taylor	4.0	3.2	2.6	3.1	2.7	1.5	4.5	1.9	2.9
5	Barbour	2.0	4.6	1.9	1.4	5.6	4.2	2.0	2.5	3.0
5	Grant	2.5	1.8	2.6	1.6	2.7	3.5	3.8	3.3	2.7
5	Hardy	1.8	1.9	1.3	1.7	2.8	3.4	2.4	3.4	2.3
5	Lewis	3.1	2.9	2.9	2.3	2.3	4.0	2.2	3.1	2.8
5	Pendleton	2.7	3.2	2.7	3.1	4.1	6.9	5.6	4.7	4.1
5	Randolph	3.7	3.6	2.0	2.5	3.5	3.2	2.6	2.3	2.9
5	Tucker	2.1	3.4	2.7	4.9	4.6	6.5	7.1	3.8	4.4
5	Upshur	2.1	3.0	2.6	3.1	4.2	3.3	2.9	2.3	2.9
6	Berkeley	2.2	2.6	2.8	3.0	2.2	2.6	3.0	3.1	2.7
6	Hampshire	1.9	4.7	4.8	2.0	0.8	0.7	0.8	1.9	2.2
6	Jefferson	1.2	1.0	0.7	3.8	4.2	3.7	1.5	2.3	2.3
6	Mineral	1.7	1.6	1.8	3.2	2.8	2.2	2.3	4.5	2.5
6	Morgan	0.9	1.5	0.4	2.6	2.5	3.0	3.3	3.4	2.2
8	Brooke	2.0	2.5	1.7	1.8	1.9	2.0	2.2	1.8	2.0
8	Hancock	1.9	3.5	3.7	3.7	2.1	2.5	2.1	1.4	2.6
8	Marshall	2.8	1.8	1.7	5.0	3.3	2.0	1.9	2.2	2.6
8	Ohio	2.0	1.3	1.3	1.3	0.6	1.4	1.3	1.7	1.4
8	Wetzel/Tyler	3.5	4.2	1.5	1.4	1.7	2.7	2.0	2.2	2.4
9	Calhoun	1.2	2.8	2.6	0.5	0.0	1.2	1.8	1.0	1.4
9	Gilmer	1.1	1.7	1.3	0.3	1.5	2.6	2.3	0.4	1.4
9	Jackson	1.4	1.4	1.7	3.8	2.2	3.1	2.7	1.7	2.2
9	Mason	1.3	1.3	2.4	2.0	2.6	4.2	2.8	3.6	2.5
9	Pleasants	1.9	1.3	1.5	0.8	1.4	3.0	4.0	1.2	1.9
9	Ritchie	3.0	1.6	2.1	1.8	1.5	1.5	1.3	2.6	1.9
9	Roane	2.5	2.6	3.4	2.1	1.8	2.1	2.0	2.6	2.4
9	Wirt	1.1	2.0	1.8	2.0	0.7	2.0	1.2	1.0	1.5
9	Wood	3.9	3.2	2.6	1.6	1.8	2.2	2.8	3.1	2.7
11	Boone	7.7	2.1	2.3	1.5	2.7	2.0	2.2	1.8	2.8
11	Cabell	2.2	2.1	1.6	2.5	1.6	1.8	1.8	1.8	1.9
11	Kanawha	1.5	2.4	1.7	2.3	1.9	2.0	2.4	2.2	2.0
11	Lincoln	2.0	1.6	1.8	1.1	2.7	2.3	2.6	2.3	2.0
11	Putnam	2.3	1.1	1.3	3.1	2.5	2.7	3.6	3.0	2.4
11	Wayne	1.6	2.0	0.9	0.7	1.3	5.4	3.1	4.0	2.4

Overweight - High Weight for Height										Table 3
		1992	1993	1994	1995	1996	1997	1998	1999	Average
	US	9.8	9.9	10	9.9	10.1	10.3	10.6	11.0	10.2
	WV	8.2	8.4	9.1	8.8	8.7	7.9	7.9	8.1	8.4
LA	County	1992	1993	1994	1995	1996	1997	1998	1999	Average
1	Fayette	8.2	9.3	12.1	14.0	11.2	10.1	9.3	7.5	10.2
1	Logan	9.7	9.9	11.8	14.0	15.7	12.9	12.3	13.1	12.4
1	Mcdowell	7.8	7.6	10.0	11.1	11.6	10.4	10.6	10.6	10.0
1	Mercer	8.1	7.9	9.3	9.9	7.6	6.6	5.8	7.4	7.8
1	Mingo	7.3	7.7	7.2	8.3	8.6	7.3	8.1	10.0	8.1
1	Monroe	9.9	7.8	8.5	11.0	11.6	12.4	9.8	8.5	9.9
1	Raleigh	6.7	7.1	8.4	9.3	10.5	7.4	6.9	6.5	7.8
1	Summers	11.7	11.6	12.0	13.0	11.0	9.2	10.9	8.4	11.0
1	Wyoming	16.1	13.9	13.2	13.2	13.2	14.1	15.1	9.9	13.6
2	Braxton	6.5	6.8	7.5	7.0	6.9	5.2	7.1	8.2	6.9
2	Clay	6.0	7.5	8.0	10.2	9.4	9.7	11.8	7.4	8.8
2	Greenbrier	6.8	6.6	7.5	8.5	6.2	6.6	6.5	9.9	7.3
2	Nicholas	8.3	10.0	11.3	7.6	7.4	8.9	8.3	9.8	9.0
2	Pocahontas	7.2	6.3	6.5	6.7	6.7	6.6	6.2	9.0	6.9
2	Webster	7.4	7.1	7.8	7.3	9.2	11.8	11.3	9.7	9.0
3	Doddridge	6.3	7.3	9.7	15.5	13.9	13.9	12.5	7.2	10.8
3	Harrison	8.6	7.6	9.3	11.2	9.4	8.0	8.3	8.1	8.8
3	Marion	6.6	8.2	8.8	9.1	9.5	9.1	7.9	9.0	8.5
3	Monongalia	6.2	6.1	8.6	7.6	7.1	6.0	7.7	9.4	7.3
3	Preston	7.1	5.4	5.8	8.0	7.6	5.7	5.1	6.3	6.4
3	Taylor	5.1	6.7	9.9	6.6	7.3	8.2	5.8	8.8	7.3
5	Barbour	7.6	6.7	8.8	5.6	7.0	5.3	5.3	4.9	6.4
5	Grant	8.2	7.6	9.8	7.8	6.3	5.9	8.7	6.3	7.6
5	Hardy	8.6	6.4	8.1	8.0	7.5	5.4	6.1	7.4	7.2
5	Lewis	6.5	6.2	6.3	6.1	5.5	6.1	7.3	6.6	6.3
5	Pendleton	8.4	8.4	8.4	7.7	9.7	5.7	6.2	7.2	7.7
5	Randolph	5.5	4.5	8.0	8.7	7.6	6.9	7.5	7.3	7.0
5	Tucker	7.6	4.9	9.0	7.0	5.9	5.2	5.7	7.4	6.6
5	Upshur	7.1	7.6	7.3	5.5	5.1	4.1	6.1	7.1	6.2
6	Berkeley	9.1	7.8	7.8	9.0	7.0	5.6	5.0	5.6	7.1
6	Hampshire	9.1	6.6	6.3	7.7	5.6	7.4	6.9	7.1	7.1
6	Jefferson	8.7	11.0	10.6	12.2	8.7	7.0	9.2	13.5	10.1
6	Mineral	10.0	10.8	10.5	5.7	7.6	8.3	6.9	6.2	8.2
6	Morgan	9.7	9.6	12.3	6.5	6.8	6.8	8.5	4.5	8.1
8	Brooke	7.0	6.5	5.8	6.5	6.8	4.6	4.8	6.1	6.0
8	Hancock	9.1	7.3	7.2	6.1	8.8	6.9	9.1	5.7	7.5
8	Marshall	6.4	6.9	7.6	5.9	5.1	4.8	6.1	6.7	6.2
8	Ohio	8.1	6.6	8.3	7.9	9.5	9.3	10.5	10.4	8.8
8	Wetzel/Tyler	6.5	7.7	7.7	6.0	6.1	8.6	8.7	8.7	7.5
9	Calhoun	9.9	10.5	12.8	16.4	13.4	12.6	11.5	9.9	12.1
9	Gilmer	9.9	9.3	8.5	14.6	8.7	12.2	10.5	8.1	10.2
9	Jackson	8.8	10.5	7.9	6.8	7.0	4.5	5.9	6.9	7.3
9	Mason	7.1	8.7	6.3	5.2	4.9	4.6	4.3	4.6	5.7
9	Pleasants	6.3	12.5	10.0	5.9	7.2	6.7	7.8	10.9	8.4
9	Ritchie	8.4	9.6	10.0	8.7	12.2	12.8	11.2	10.4	10.4
9	Roane	9.3	9.4	9.5	11.1	12.0	12.2	13.1	10.8	10.9
9	Wirt	6.1	6.7	8.5	11.6	8.4	6.5	7.4	10.2	8.2
9	Wood	6.0	6.9	8.0	9.3	8.3	8.3	7.0	7.5	7.7
11	Boone	10.1	11.6	11.7	11.1	9.7	7.7	9.3	10.7	10.2
11	Cabell	10.2	9.3	10.2	9.0	9.6	9.8	9.0	9.8	9.6
11	Kanawha	9.4	7.8	9.5	7.6	8.3	8.1	7.0	7.1	8.1
11	Lincoln	5.7	8.0	10.4	7.6	8.1	8.6	10.1	7.3	8.2
11	Putnam	9.1	10.9	10.5	6.5	7.2	5.6	4.6	4.1	7.3
11	Wayne	10.5	9.7	13.3	11.4	11.8	4.3	5.6	6.5	9.1

Low Birth Weight										Table 4
		1992	1993	1994	1995	1996	1997	1998	1999	Average
	US	9.4	9.2	9.2	9.2	9.1	9.2	9.4	9.4	9.3
	WV	8.3	8.2	8.3	9.2	9.7	10.0	10.0	10.0	9.2
LA	County	1992	1993	1994	1995	1996	1997	1998	1999	Averagee
1	Fayette	7.9	8.0	7.5	9.1	9.2	7.9	8.9	7.9	8.3
1	Logan	9.3	8.7	9.2	8.4	9.6	9.8	9.7	9.6	9.3
1	Mcdowell	8.3	8.5	7.8	9.2	10.4	11.2	11.3	10.8	9.7
1	Mercer	9.4	8.5	9.1	10.2	11.6	13.0	13.2	13.0	11.0
1	Mingo	7.1	7.1	8.0	7.8	8.0	9.5	9.0	9.6	8.3
1	Monroe	9.0	7.5	8.3	7.0	7.6	5.7	4.5	6.2	7.0
1	Raleigh	9.1	9.9	9.8	11.4	11.2	10.4	10.0	10.5	10.3
1	Summers	8.9	8.8	8.5	6.9	8.2	11.4	12.7	10.7	9.5
1	Wyoming	6.8	7.1	6.8	7.2	8.1	7.2	8.4	8.1	7.5
2	Braxton	5.4	4.7	6.3	6.4	6.3	6.9	5.9	7.3	6.2
2	Clay	6.2	6.5	8.4	7.6	8.8	9.4	8.6	7.1	7.8
2	Greenbrier	6.5	6.3	7.5	8.5	9.8	8.9	8.7	9.0	8.2
2	Nicholas	9.1	9.0	10.0	9.8	9.8	9.1	10.0	11.3	9.8
2	Pocahontas	11.0	7.4	9.3	13.1	10.7	13.1	11.3	11.4	10.9
2	Webster	6.9	6.4	7.7	9.3	9.3	9.2	8.5	10.0	8.4
3	Doddridge	7.8	7.8	9.0	6.5	8.6	9.7	9.1	10.2	8.6
3	Harrison	7.9	8.3	8.3	7.8	8.5	9.8	9.0	9.5	8.6
3	Marion	6.5	6.3	6.6	7.6	9.0	10.1	10.0	10.5	8.3
3	Monongalia	9.8	9.5	10.3	11.5	10.8	10.3	10.2	9.2	10.2
3	Preston	7.2	7.4	9.7	10.2	10.4	11.9	12.9	12.5	10.3
3	Taylor	12.0	11.8	10.9	9.2	9.1	10.6	10.6	10.7	10.6
5	Barbour	7.8	7.6	7.8	7.8	9.5	10.3	10.6	8.6	8.8
5	Grant	6.8	8.2	7.9	8.1	7.3	9.3	6.0	8.2	7.7
5	Hardy	7.4	6.4	6.7	9.8	9.1	9.8	10.4	7.2	8.4
5	Lewis	9.3	7.6	7.8	9.2	8.8	9.5	10.4	11.7	9.3
5	Pendleton	6.6	7.1	7.4	5.9	7.5	10.0	8.4	8.8	7.7
5	Randolph	7.4	7.2	6.9	9.4	9.4	9.3	9.4	8.9	8.5
5	Tucker	7.1	9.8	11.4	10.1	10.2	10.1	7.4	11.4	9.7
5	Upshur	8.8	9.1	7.7	8.3	9.1	7.4	9.1	8.5	8.5
6	Berkeley	8.1	8.9	8.0	9.0	9.3	9.7	9.4	9.6	9.0
6	Hampshire	6.0	8.4	9.9	7.7	7.9	10.0	7.8	5.9	8.0
6	Jefferson	6.5	8.3	8.5	12.2	14.0	12.4	12.2	11.6	10.7
6	Mineral	6.9	5.8	5.4	5.7	8.6	9.3	9.4	11.6	7.8
6	Morgan	7.8	4.9	3.7	6.5	8.4	12.2	8.7	9.4	7.7
8	Brooke	8.1	7.4	7.2	11.0	10.9	9.3	9.5	8.7	9.0
8	Hancock	13.5	11.0	9.4	11.6	10.9	11.1	9.7	9.2	10.8
8	Marshall	8.5	6.9	5.7	7.8	8.4	9.0	9.4	9.6	8.2
8	Ohio	7.6	7.3	7.1	8.3	10.1	9.0	8.5	9.1	8.4
8	Wetzel/Tyler	7.3	6.5	6.3	7.6	9.5	9.2	10.4	10.0	8.4
9	Calhoun	6.5	6.6	9.4	7.9	7.6	9.8	7.9	9.3	8.1
9	Gilmer	8.5	8.2	7.6	7.9	9.6	7.8	8.2	6.4	8.0
9	Jackson	8.4	8.9	8.1	8.2	7.7	9.1	9.6	10.0	8.8
9	Mason	5.6	4.6	5.4	8.2	9.5	11.3	13.0	12.7	8.8
9	Pleasants	7.7	10.9	13.5	10.7	8.0	8.5	8.6	5.3	9.1
9	Ritchie	5.9	6.4	6.7	7.5	11.0	9.5	9.2	10.1	8.3
9	Roane	7.4	7.1	6.4	8.2	10.5	9.3	10.4	10.1	8.7
9	Wirt	12.7	11.0	8.2	6.7	6.0	8.5	12.0	12.9	9.8
9	Wood	7.9	7.2	7.3	8.2	8.8	9.2	9.5	9.3	8.4
11	Boone	9.7	9.7	7.8	9.1	8.9	8.2	10.2	10.8	9.3
11	Cabell	9.3	9.3	9.5	10.3	10.5	11.5	11.5	11.1	10.4
11	Kanawha	9.3	10.0	9.6	11.0	10.7	11.0	10.9	10.5	10.4
11	Lincoln	9.2	9.9	8.4	9.5	10.7	11.5	11.1	10.7	10.1
11	Putnam	7.5	8.2	7.5	9.4	9.6	10.0	10.8	11.2	9.3
11	Wayne	9.1	8.7	10.4	9.5	9.1	7.1	7.7	7.5	8.6

Anemia - Low Hemoglobin										Table 5
		1992	1993	1994	1995	1996	1997	1998	1999	Average
	US	20.5	20.4	19.8	19.8	18.5	17.7	17.5	16.5	18.8
	WV	12.7	8.6	7.7	10.1	9.3	8.1	6.5	7.5	8.8
LA	County	1992	1993	1994	1995	1996	1997	1998	1999	Average
1	Fayette	6.5	4.8	2.6	8.0	7.6	2.1	3.0	8.4	5.4
1	Logan	5.6	3.4	2.0	20.5	8.2	2.7	4.5	9.4	7.0
1	Mcdowell	6.2	4.1	5.7	6.4	5.5	8.3	3.6	3.2	5.4
1	Mercer	5.2	5.1	3.5	5.1	6.4	4.2	3.7	7.9	5.1
1	Mingo	13.6	5.4	3.3	7.1	7.6	8.1	5.2	7.3	7.2
1	Monroe	4.7	4.5	2.4	9.5	12.8	12.1	11.1	5.8	7.9
1	Raleigh	13.5	7.8	5.2	6.2	7.2	6.0	5.0	9.0	7.5
1	Summers	7.4	4.5	0.6	2.7	6.9	5.4	3.0	9.2	5.0
1	Wyoming	13.5	8.0	5.1	12.2	15.4	10.6	9.9	11.0	10.7
2	Braxton	13.7	10.3	11.1	12.7	10.9	14.8	13.1	11.8	12.3
2	Clay	10.8	6.2	5.7	8.5	14.3	12.5	8.1	9.6	9.5
2	Greenbrier	12.4	8.1	12.7	22.6	20.6	12.9	16.8	18.9	15.6
2	Nicholas	9.9	4.7	7.5	6.6	5.3	4.9	5.6	5.8	6.3
2	Pocahontas	8.1	10.5	10.6	13.1	14.7	8.6	4.4	13.7	10.5
2	Webster	14.4	8.5	3.1	2.3	6.3	7.9	4.0	6.0	6.6
3	Doddridge	3.6	4.3	1.8	0.0	2.0	1.3	0.8	2.1	2.0
3	Harrison	5.0	1.9	1.8	2.7	3.3	5.0	4.5	3.6	3.5
3	Marion	9.4	3.8	5.8	5.6	2.7	4.0	3.8	3.7	4.9
3	Monongalia	11.4	5.7	6.6	9.4	6.7	8.3	8.3	3.4	7.5
3	Preston	8.9	5.0	6.0	3.4	4.4	8.0	4.0	5.3	5.6
3	Taylor	9.5	7.9	4.9	7.5	3.4	4.6	6.7	5.7	6.3
5	Barbour	11.2	6.7	5.2	7.7	5.0	1.4	1.2	2.8	5.1
5	Grant	15.9	11.2	9.5	4.0	6.6	5.2	2.0	3.3	7.2
5	Hardy	14.2	10.8	8.4	9.6	8.6	7.0	5.5	6.4	8.8
5	Lewis	8.6	10.6	9.5	9.7	7.6	7.7	2.1	2.4	7.3
5	Pendleton	14.9	14.7	7.6	7.6	5.2	6.7	1.3	3.0	7.6
5	Randolph	10.0	6.1	5.3	7.3	5.6	4.1	1.6	0.7	5.1
5	Tucker	8.0	5.8	5.2	7.8	5.3	3.1	2.0	2.1	4.9
5	Upshur	12.2	9.0	7.9	12.2	6.8	8.6	5.2	6.0	8.5
6	Berkeley	18.8	15.1	11.5	12.7	17.3	18.4	7.7	14.5	14.5
6	Hampshire	31.8	21.5	19.7	23.2	16.3	13.9	13.5	6.7	18.3
6	Jefferson	27.3	19.9	7.1	6.2	4.5	5.5	7.7	4.0	10.3
6	Mineral	24.1	14.9	12.1	16.0	10.5	7.7	8.0	9.0	12.8
6	Morgan	18.0	13.0	14.6	21.0	23.3	18.5	11.3	19.8	17.4
8	Brooke	19.6	16.9	7.0	8.1	9.4	13.9	9.9	6.8	11.5
8	Hancock	21.1	14.7	10.4	15.3	10.4	11.2	6.7	6.4	12.0
8	Marshall	14.1	5.7	4.9	5.3	4.5	2.7	1.2	2.3	5.1
8	Ohio	12.9	6.8	8.8	9.4	16.5	5.8	7.0	4.1	8.9
8	Wetzel/Tyler	12.8	11.5	13.7	15.7	14.5	3.5	2.7	2.9	9.7
9	Calhoun	30.4	21.8	23.8	16.4	11.2	10.9	12.4	9.2	17.0
9	Gilmer	16.1	13.2	15.7	15.8	18.7	19.1	11.1	6.3	14.5
9	Jackson	17.4	10.1	11.1	11.2	13.0	18.5	16.4	16.4	14.3
9	Mason	21.3	12.2	9.8	15.2	12.1	12.8	13.9	15.0	14.0
9	Pleasants	31.0	21.7	7.3	17.6	13.4	11.3	11.4	10.8	15.6
9	Ritchie	20.3	17.5	11.4	10.2	10.7	12.7	13.1	14.8	13.8
9	Roane	17.0	9.1	10.3	14.7	11.0	10.0	8.3	6.8	10.9
9	Wirt	25.0	15.4	17.6	14.1	16.0	12.4	8.8	5.7	14.4
9	Wood	16.5	12.4	14.0	17.7	14.2	12.6	9.1	11.5	13.5
11	Boone	16.0	12.5	13.1	12.1	9.3	10.1	8.4	6.7	11.0
11	Cabell	8.4	3.7	4.6	8.0	7.2	8.6	4.6	5.7	6.4
11	Kanawha	13.3	10.0	10.0	10.3	10.3	7.7	7.0	7.0	9.4
11	Lincoln	13.0	8.6	4.1	3.8	3.4	3.0	0.9	1.7	4.8
11	Putnam	10.6	4.2	3.4	7.6	6.7	5.4	3.0	7.1	6.0
11	Wayne	15.8	6.5	6.9	8.1	9.5	5.6	4.2	5.0	7.7

Recommendations

- Implementation of innovative strategies to reverse the trend of overweight among children, including incorporating components of physical activity and prevention of overweight.

- Outreach activities promoting early identification of pregnancy and early entry into prenatal care, including WIC Program activities, to identify those mothers at risk for a low birth weight infant.

- Establish breastfeeding as a societal norm. Continue development and implementation of effective strategies to promote breastfeeding.

- Investigation into causes and contributing factors leading to differences in risk indicators in varying geographic areas.

- Continued emphasis on ensuring medical insurance coverage for young children, improving access to primary and preventative care.

- Intervention research to determine which strategies are successful in reducing risk, and financial support for implementation activities.

Endnotes

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