Health Status: Minnesota children enrolled in WIC 1999 to 2008

Data in this report were prepared by the Centers for Disease Control and Prevention's (CDC's) Pediatric Nutrition Surveillance System (PedNSS).

The Minnesota-specific data depicted in the report represent the status of children participating in the MN WIC Program in 2008. The data are a "snapshot" in time, with each child represented only once. Trend data do not necessarily reflect the same children from one year to the next, and so should not be interpreted to reflect changes in those children's health status. Rather the changes reflect health status of the population over time.

Infants and children participating in WIC come from families with limited resources. Only families with incomes at or below 185% of federal poverty (or eligible to receive benefits from another program with comparable income guidelines), are eligible for WIC services. Additionally, all children participating in WIC are considered at nutritional risk.

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Pediatric Nutrition Surveillance System

The Pediatric Nutrition Surveillance System (PedNSS) is a child-based public health surveillance system that monitors the nutritional status of low-income children in federally funded maternal and child health programs. The Minnesota data included in PedNSS is data derived from children enrolled in the Minnesota Special Supplemental Food Program for Women Infants and Children (WIC). The national PedNSS data includes records from other federally funded programs in addition to WIC, but is the comparable national group. The data reported here includes: birthweight, short stature, underweight, overweight, anemia, and breastfeeding. Data are collected at the clinic level, aggregated to the state level, and submitted to the Centers for Disease Control and Prevention (CDC) for analysis.

The goal of PedNSS is to collect, analyze, and disseminate surveillance data to guide public health policy and action. PedNSS information is used to set priorities and plan, implement, and evaluate nutrition programs. This report summarizes 2008 data and highlights trends from 1999 through 2008 in Minnesota.

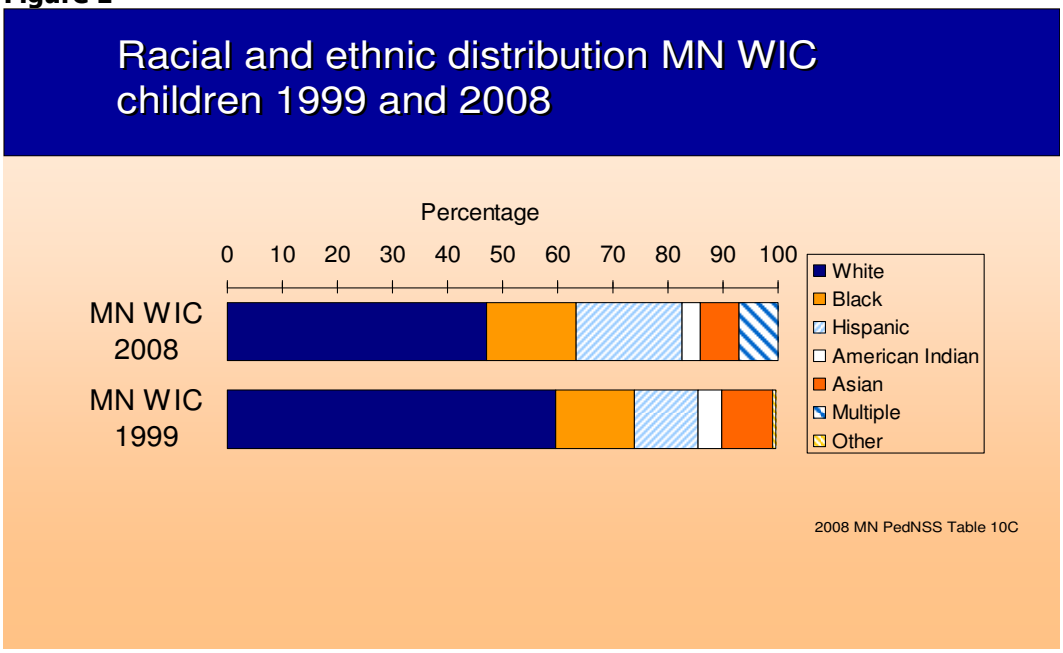
New in this year's report are the designations given to children's weight status. Prior to 2008, CDC used the term "at risk of overweight" to describe children with a body mass index (BMI, for age and gender) $\geq 85^{th}$ percentile but $< 95^{th}$ percentile. This weight status is now designated "overweight". Children with BMI $\geq 95^{th}$ percentile for age and gender, are considered "obese". Prior to 2008, this weight status was designated "overweight".[1]

Demographic Characteristics

During 2008, the Minnesota WIC program served an average monthly caseload of 141,436 participants. Among the children served, 47.0% were non-Hispanic white children, 19.3% Hispanic children, 16.3% black/African American children, 7.2% Asian/Pacific Islander children, 3.2% American Indian/Alaska Native children, and 7.0% were children with multiple or unspecified ethnicity and/or races. The number of participants and the racial and ethnic distribution have changed substantially over the past decade.

In 1999, the average monthly caseload was 93,892 participants. Of the children served that year, 59.6% were non-Hispanic white children, 11.6% Hispanic children, 14.3% black/African American children, 9.6% Asian/Pacific Islander children, and 4.3% American Indian/Alaska Native children (Figure 1).

Figure 1



In the past decade, children in Minnesota WIC have become more diverse. There are fewer White, Asian and American Indian children, and more Hispanic children. In 2008, a significant segment of children (7%) were identified by their parents as multiple races (an option not available in 1999).

	1999	**2008**
White, Not Hispanic	59.6%	47.0%
Black, Not Hispanic	14.3%	16.3%
Hispanic	11.6%	19.3%
American Indian	4.3%	3.2%
Asian	9.6%	7.2%
Multiple races	0.0%	7.0%
All Other & Unknown	0.6%	0.0%

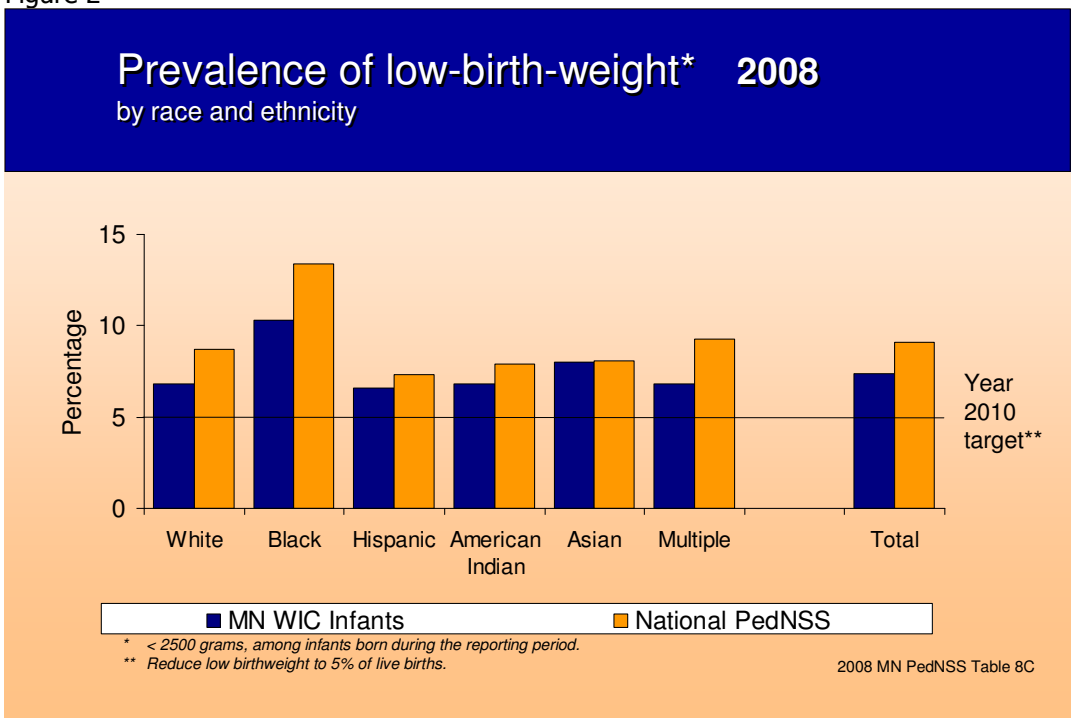
Pediatric Health Indicators

Low-Birth-Weight

The single most important factor affecting neonatal mortality, and a significant determinant of post-neonatal mortality, is low-birth-weight (< 2,500 grams).[2] Infants born at a low-birth-weight who survive, are at increased risk for a variety of health problems, including neurodevelopmental disabilities and respiratory disorders.[3]

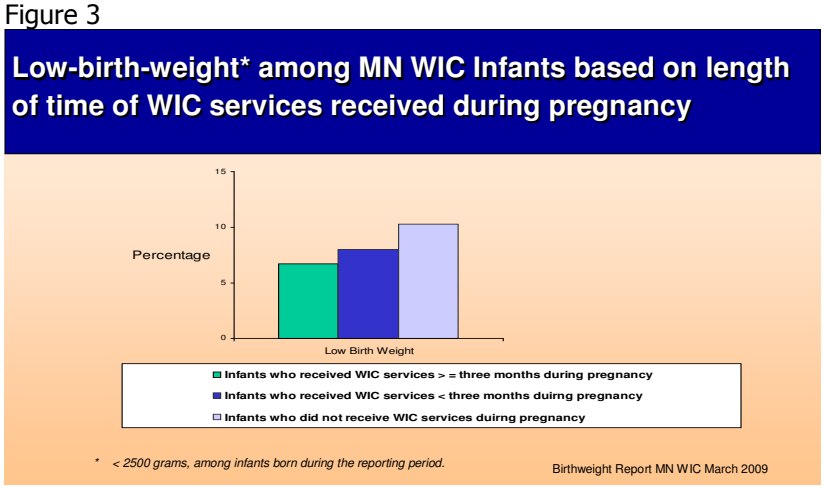
The prevalence of low-birth-weight among Minnesota WIC infants is lower than that of the national PedNSS population. In 2008, 7.4% of Minnesota WIC infants were born at a low-birth-weight, whereas 9.0% of the infants in the National PedNSS comparison group were born at a low-birth-weight. (Figure 2)

Figure 2



The longer a woman participates in WIC during her pregnancy, the less likely her infant will be born at low-birth-weight. (Figure 3)

Figure 3

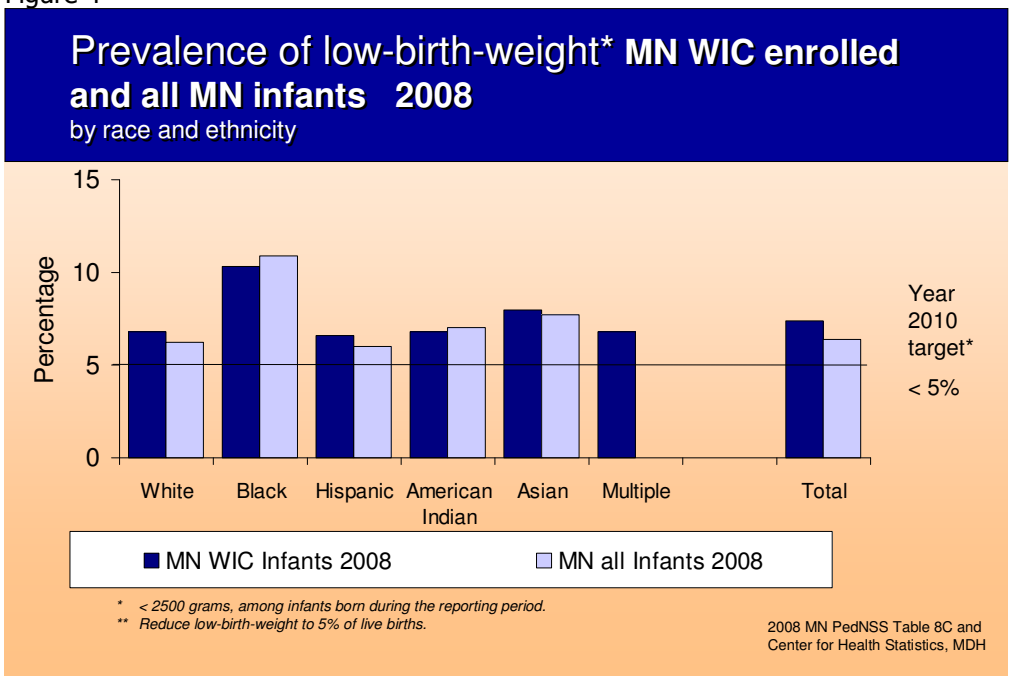


Low-Birth-Weight: MN WIC Infants compared to all MN Infants

While the prevalence of low-birth-weight among Minnesota WIC infants is *less than* their national cohort, the prevalence of low-birth weight is *greater* among MN WIC infants than it is for all infants born in Minnesota. In 2008, the prevalence was 7.4% of WIC infants versus 6.4% of all infants born in Minnesota.[4] The differences in prevalence between racial and ethnic groups is evident among both infants in WIC and all infants born in Minnesota.

The 2008 rate of low-birth-weight for both infants in WIC and all infants, is well above the *Healthy People 2010* goal (Figure 4), which calls for a reduction in the incidence of low-birth-weight to not more than 5% of all live births.[5]

Figure 4

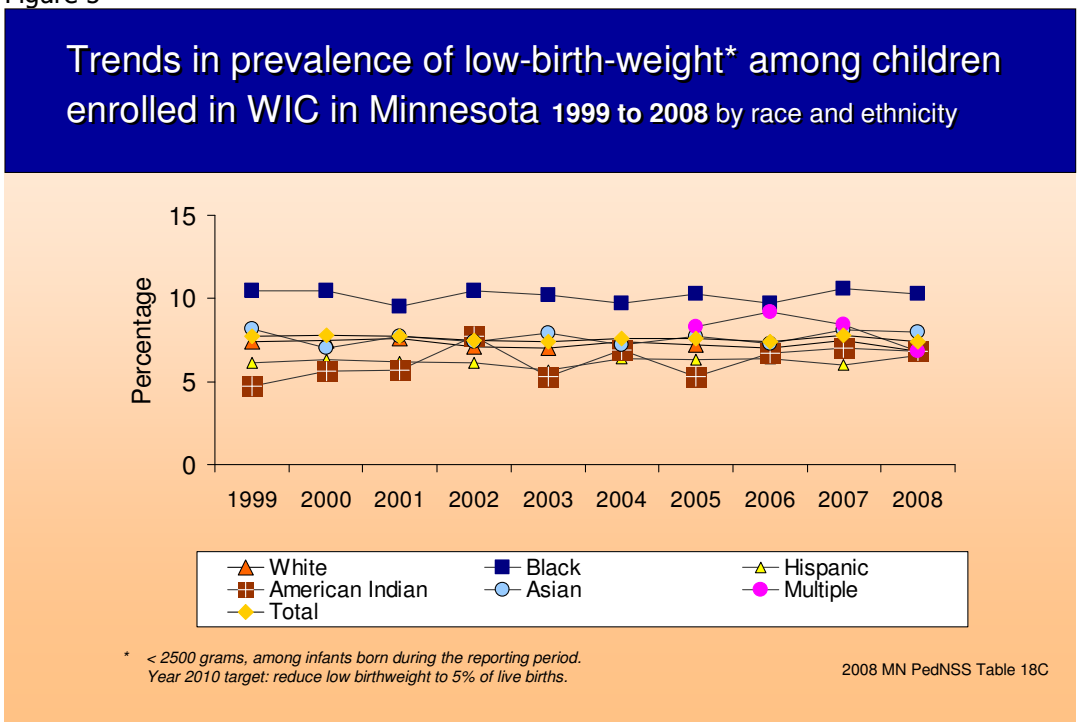


Because infants participating in WIC are lower income than all infants in Minnesota, they have a greater risk for being born at low-birth-weight.

Low-Birth-Weight Trends: MN WIC Infants

The rate of low-birth-weight among infants enrolled in the Minnesota WIC program varies by race and ethnicity (Figure 5). Of particular concern is the higher rate among Black/African American infants compared to all other racial and ethnic groups. This difference has persisted for many years, and does not appear to be improving: 10.5% in 1999; 10.6% in 2007; and 10.3% in 2008.

Figure 5



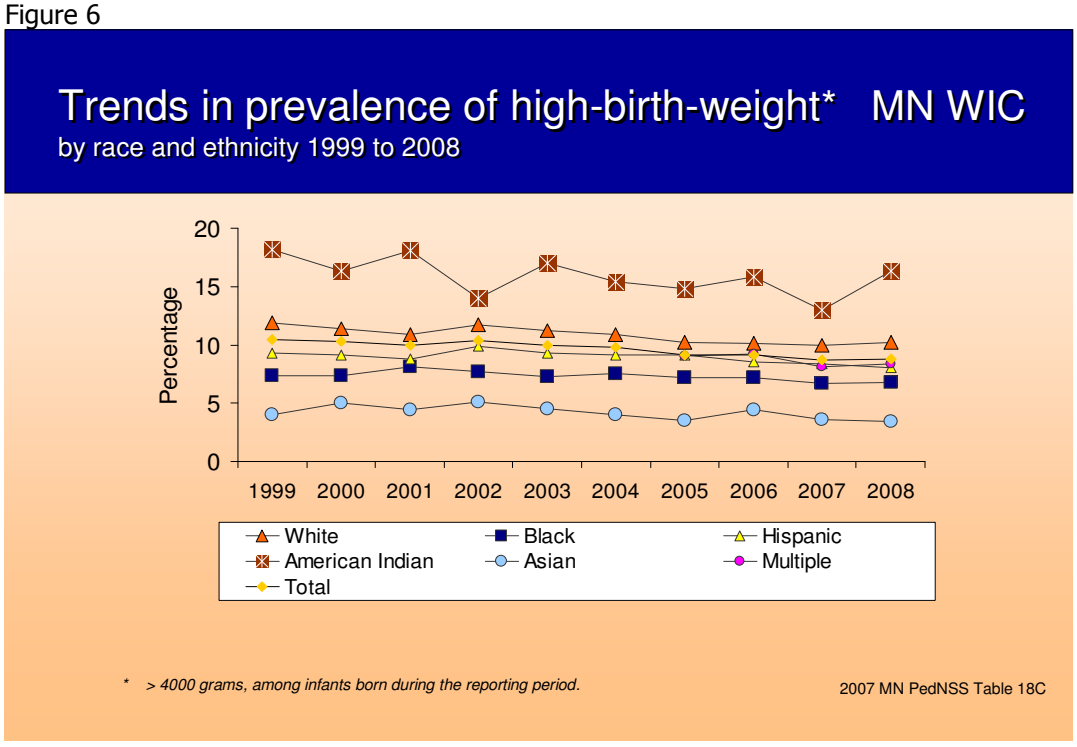
High-Birth-Weight

High-birth-weight (>4,000 grams) also puts infants at increased risk for poor health outcomes. Infants born at high-birth-weights are at increased risk of birth injuries, such as shoulder dystocia, and of premature death.[6] High-birth-weight may be a sign that gestational diabetes was present during the pregnancy. Gestational diabetes is associated with future health problems for the child, in particular obesity and diabetes.

High-birth-weight is one health indicator in which Minnesota WIC infants do less well than their national peers. In 2008, 8.8% of Minnesota WIC infants were born at a high-birth-weight, compared to 6.4% of infants in the PedNSS cohort.

The prevalence of high-birth-weight among Minnesota WIC infants has decreased somewhat in the past ten years, from 10.5% in 1999 to 8.8% in 2008. As is true for low-birth-weight, the prevalence of high-birth-weight varies considerably across racial and ethnic groups. In this case, rates of high-birth-weight are substantially greater among Native American children than in other groups. This difference has persisted over time. (Figure 6)

Figure 6



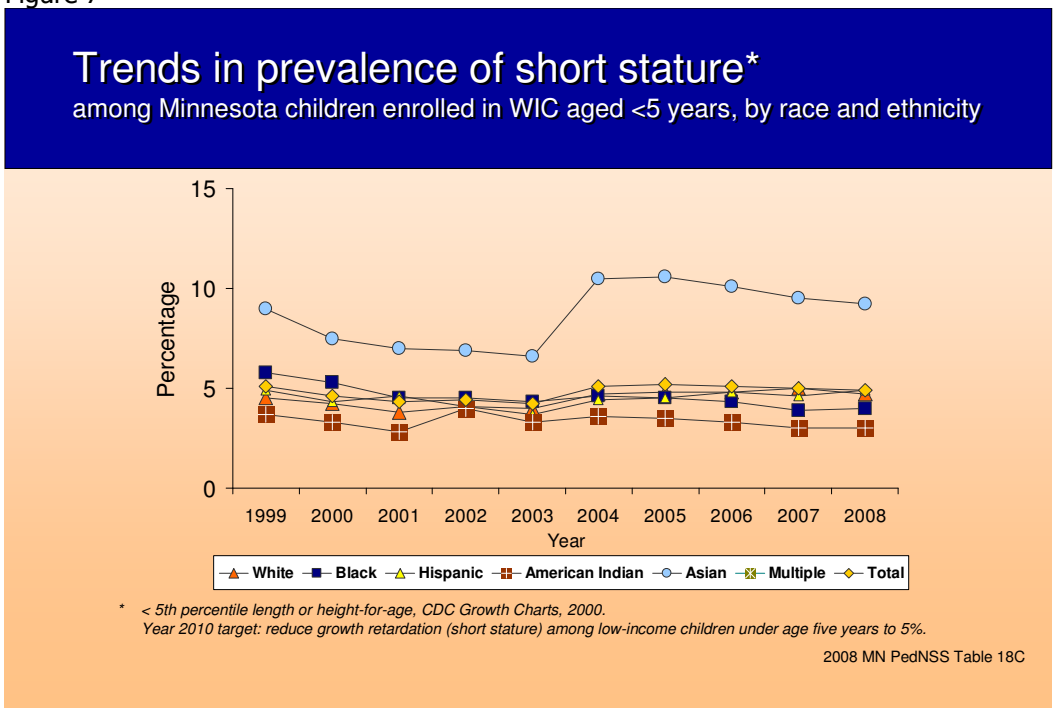
Short Stature

Short stature (low length- or height-for-age) may reflect long-term health and nutritional status of a child or a population.[7] Although short stature can be associated with short parental stature and/or low-birth-weight, it can also result from growth retardation due to chronic malnutrition caused by inadequate food intake, recurrent illness, or both.

In 2008, 4.9% of Minnesota WIC children birth-to-age-5 were short stature, compared with 3.7% of U.S. children.[8] However, the prevalence of short stature among Minnesota WIC children is not more than expected (5%) and meets the *Healthy People 2010* objective (19-4) to reduce growth retardation among low-income children less than 5 years of age to 5%[5].

The prevalence of short stature among all MN WIC children has not varied much over the past 10 years, from 5.1% (1999) to 4.9% (2008). Even when broken down by race and ethnicity, there has been very little change across the decade, with the exception of Asian/Pacific Islander children – among whom changes have been more striking. There was a notable decline in the prevalence of short stature in this group from 1999 through 2003, at which time the rate of short stature increased dramatically. This corresponds in time to an influx of new Asian immigrants to Minnesota. Since then, there has been a gradual but steady decrease in prevalence of short stature among children in the group. (Figure 7)

Figure 7



* Short Stature is defined using the 2000 CDC growth chart percentiles of less than the 5th percentile length-for-age for children younger than 2 years of age, and less than the 5th percentile height-for-age for children 2 years of age or older.

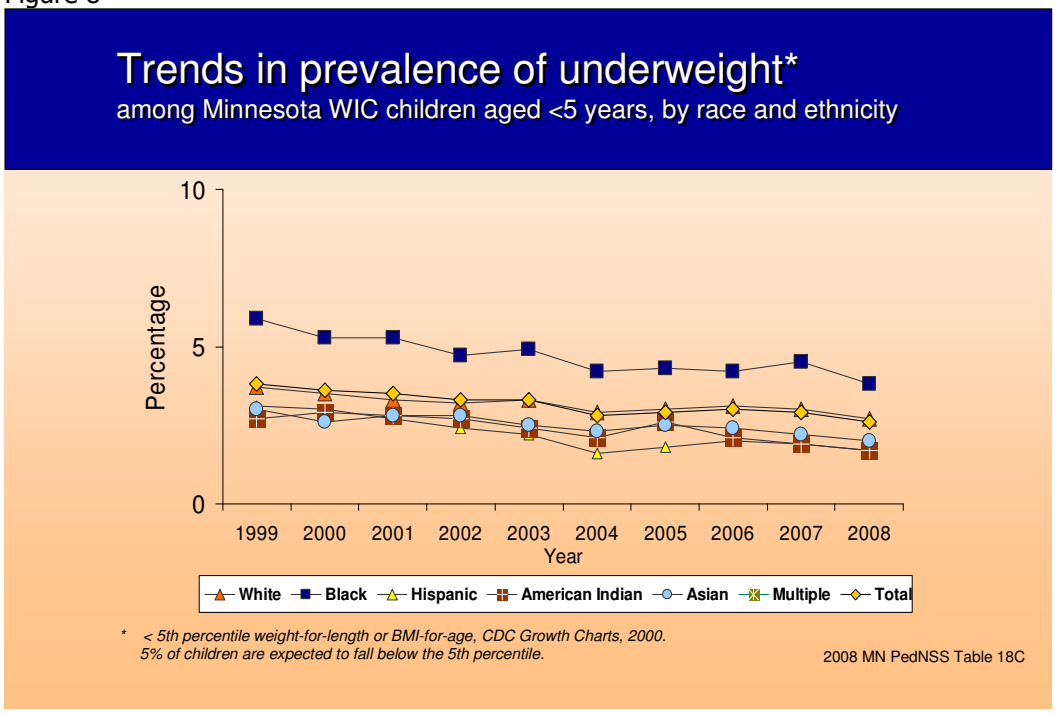
Underweight

The low prevalence of underweight* among children, birth to age 5, indicate that acute malnutrition (inadequate calories) is not a public health problem in the Minnesota WIC population. The prevalence of underweight for all Minnesota WIC children decreased over 10 years from 3.8% (1999) to 2.6% (2008), and is well below the expected prevalence of 5%. (Figure 8)

When the state WIC data are broken down by racial and ethnic groups, notable differences can be seen between groups, with the rate of underweight being higher among Black/African American children, 3.8% in 2008.

The prevalence of underweight in U.S. children in this age group is 3.4%.[8]

Figure 8



* Underweight is defined using the 2000 CDC growth chart percentiles of less than the 5th percentile weight-for-length for children younger than 2 years of age, and less than the 5th percentile BMI-for-age for children 2 years of age or older.

† To calculate BMI (body mass index): Weight (kg) ÷ Stature (cm) ÷ Stature (cm) x 10,000 **or** Weight (lb) ÷ Stature (in) ÷ Stature (in) x 703.

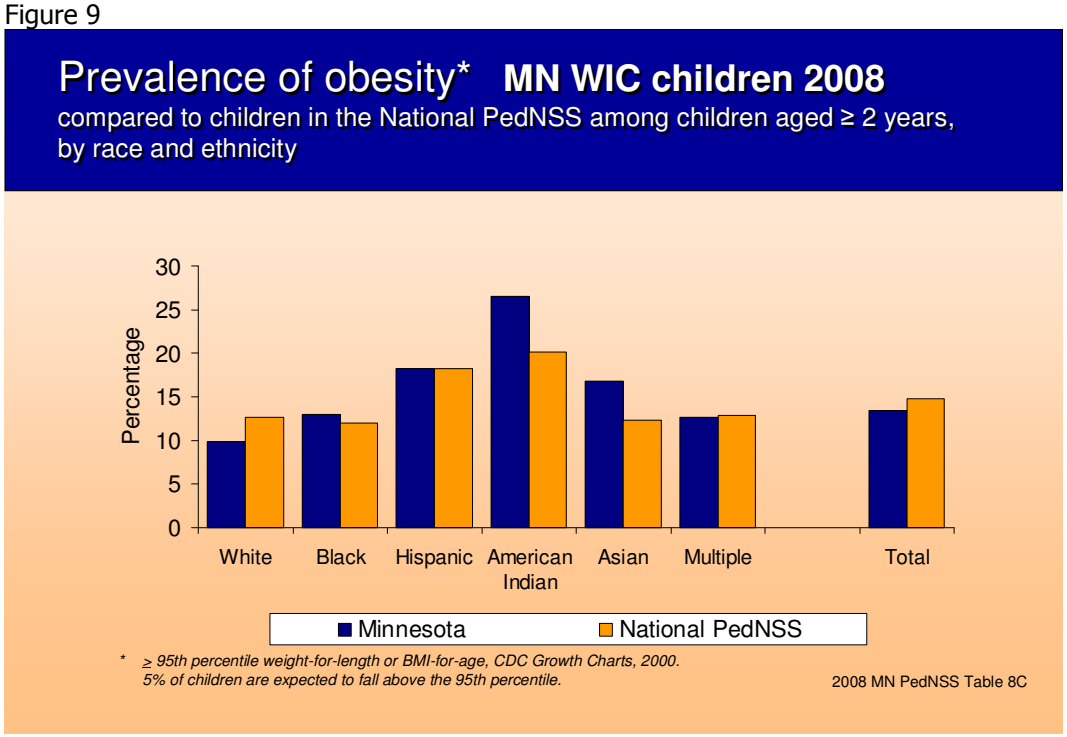
Overweight and Obesity

The prevalence of overweight and obesity in children and adolescents has increased nationwide in recent decades, highlighting the need for public health initiatives focused on prevention of overweight and obesity. [9] The Expert Committee on the Prevention, Assessment, and Treatment of Child and Adolescent Overweight and Obesity recommends applying two cutoff points for overweight and obesity in screening children aged 2 years and older: children whose BMI-for-age is between $\geq$ 85th and < 95th percentiles are considered "overweight", and those whose BMI-for-age is $\geq$95th percentile would be designated "obese". [1]

As a group, the prevalence of obesity among children participating in the MN WIC Program was slightly less than among their PedNSS peers. However, when the data for MN WIC children are broken down by race and ethnicity, only the white children compared favorably to the national sample; all other groups had the same or higher prevalence of obesity than their national peers. Of particular concern is the higher prevalence of obesity among American Indian/Alaskan Native children enrolled in Minnesota WIC (Figure 9) compared to other racial/ethnic groups in MN and nationally.

Also of interest and concern is the higher rate of obesity among Asian children enrolled in MN WIC, compared with their peers in the national PedNSS population.

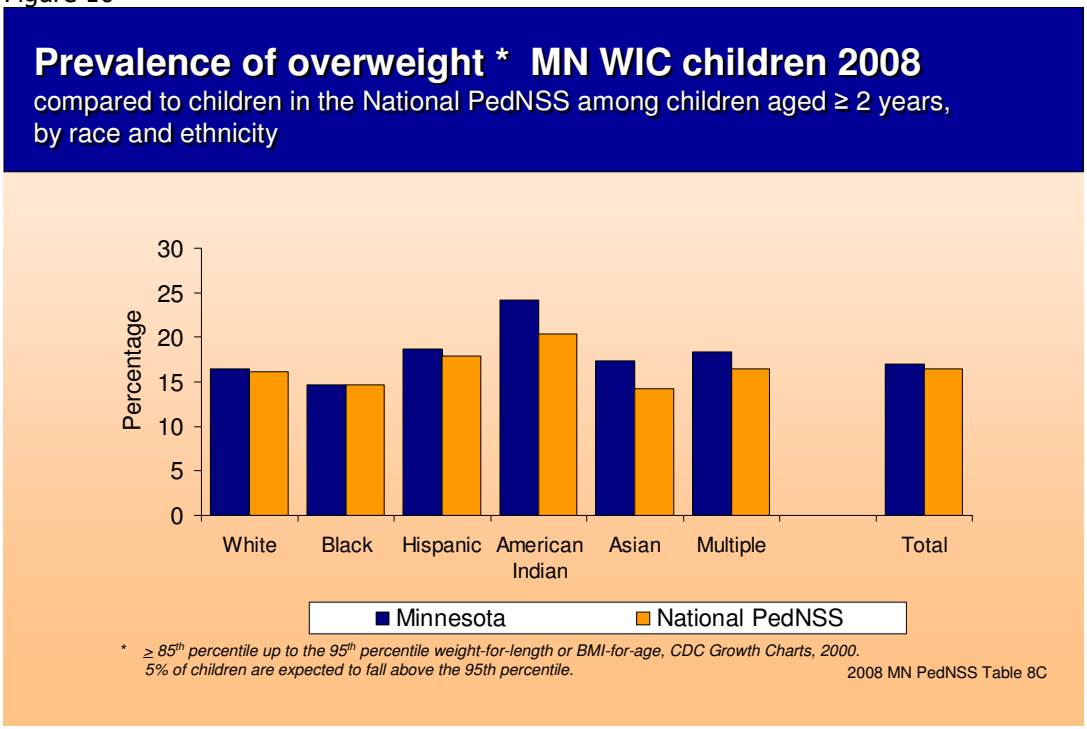
Figure 9



Overweight (BMI-for-age and gender ≥ 85th percentile up to the 95th percentile)

As a group, and when broken down by race and ethnicity, the prevalence of overweight among Minnesota WIC children is slightly higher than that of their national counterparts (Figure 10).

Figure 10



Overweight and Obesity Among All Children

The high prevalence of obesity and overweight among children in the Minnesota WIC program and in the national PedNSS data is similar to that of all children aged 2 to 5 years in the U.S. population.

In previous editions of this report, the rate of obesity was much greater for Minnesota children enrolled in WIC compared to the rate of obesity for all children. However, the prevalence of obesity for all U.S. children aged 2 to 5 years has increased in recent years. According to NHANES 2003 – 2006, 12.4% of children aged two to five years had BMI/age and gender ≥ 95th percentile. [10]

Data Source	BMI for age & gender ≥ 95th%
NHANES 2003-2006	12.4%
MN WIC (MN PedNSS) 2008	13.4%
National PedNSS 2008	14.8%

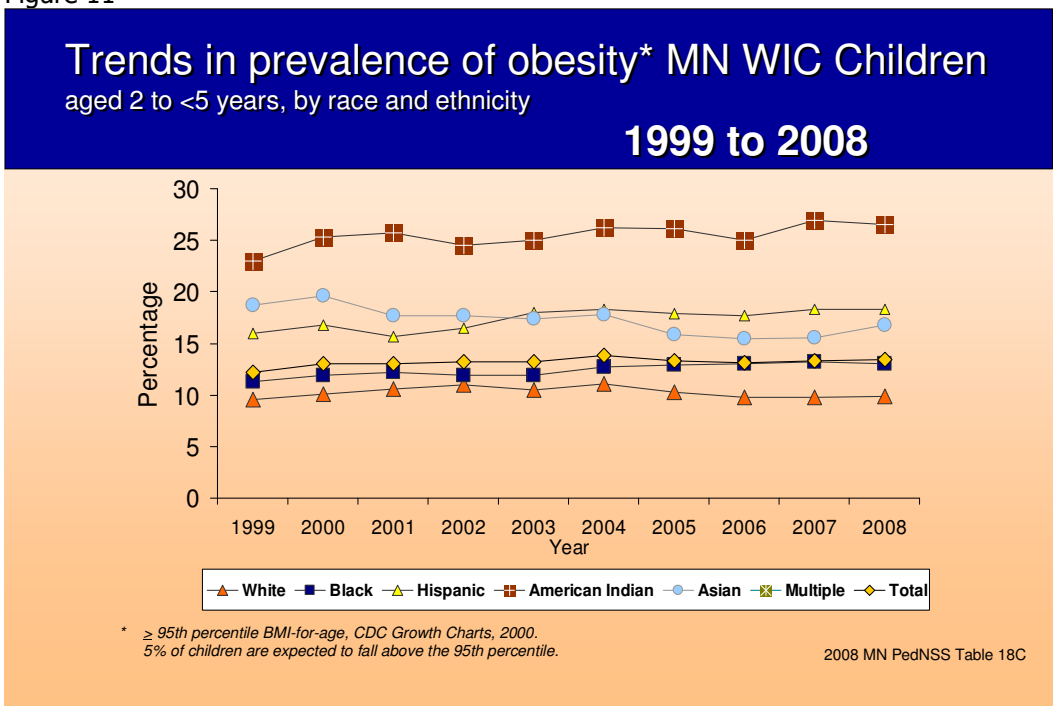
Prevalence of Obesity Among MN WIC Children: Steady Since 2004

Among children, aged 2 to 5 years, participating in the Minnesota WIC program, the prevalence of obesity increased slightly but steadily each year between 1990 (8.3%) and 2004 (13.8%). However, since 2004 the trend appears to have moderated.

While the changes are relatively small, and it is perhaps too soon to conclude that the upward trend has been interrupted, it is a positive development. This trend has also been seen in some other states, and in the national PedNSS data.

Obesity is a concern for all racial and ethnic groups in Minnesota WIC, but of particular concern is the consistently higher rate among American Indian/Alaskan Native children, 26.5% in 2008, compared to other groups. (Figure 11)

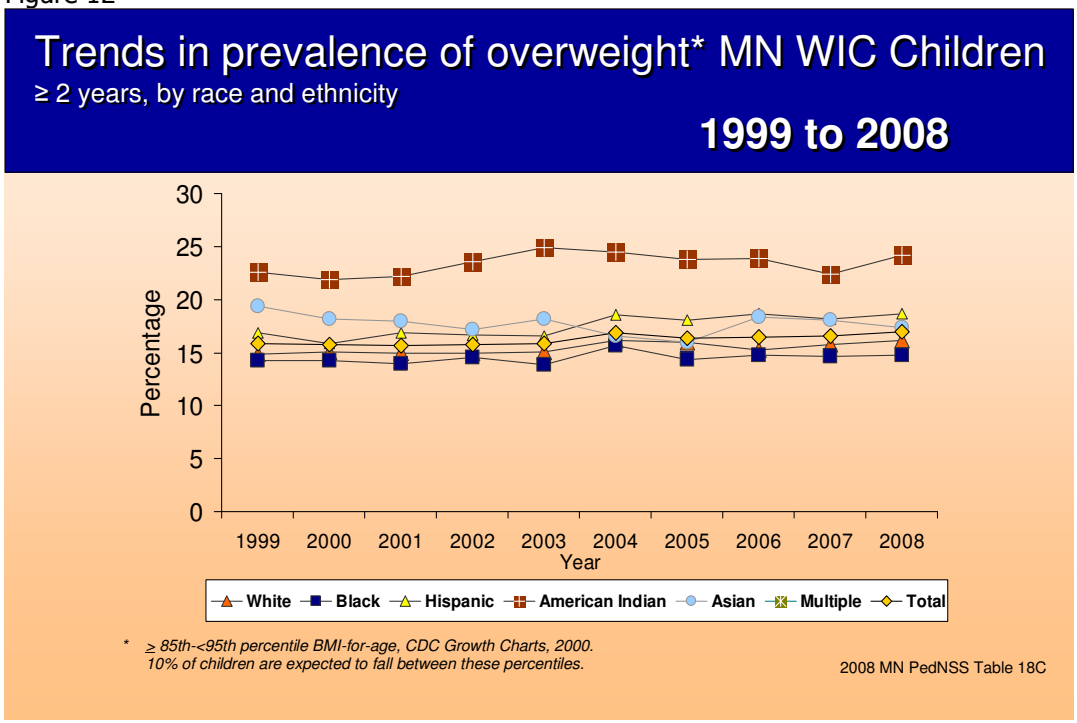
Figure 11



Prevalence of Overweight Increased but Not as Dramatically

In the Minnesota WIC population of children aged 2 to 5 years, the prevalence of overweight (BMI for age and gender, ≥85th to <95th percentile) increased from 15.9% in 1999 to 17.0% in 2008. As is true with obesity, the prevalence of overweight is notably higher among American Indian/Alaskan Native children than all other groups (Figure 12). In 2008, the prevalence of overweight was 24.2% among American Indian/Alaskan Native children.

Figure 12



Similar to the national PedNSS data, the prevalence of overweight is higher among the older Minnesota WIC children, than younger children. For example, four-year-old children are more likely to be overweight compared to younger children. This is discouraging and concerning because with increasing age, there is an increased association between childhood overweight and adult overweight.

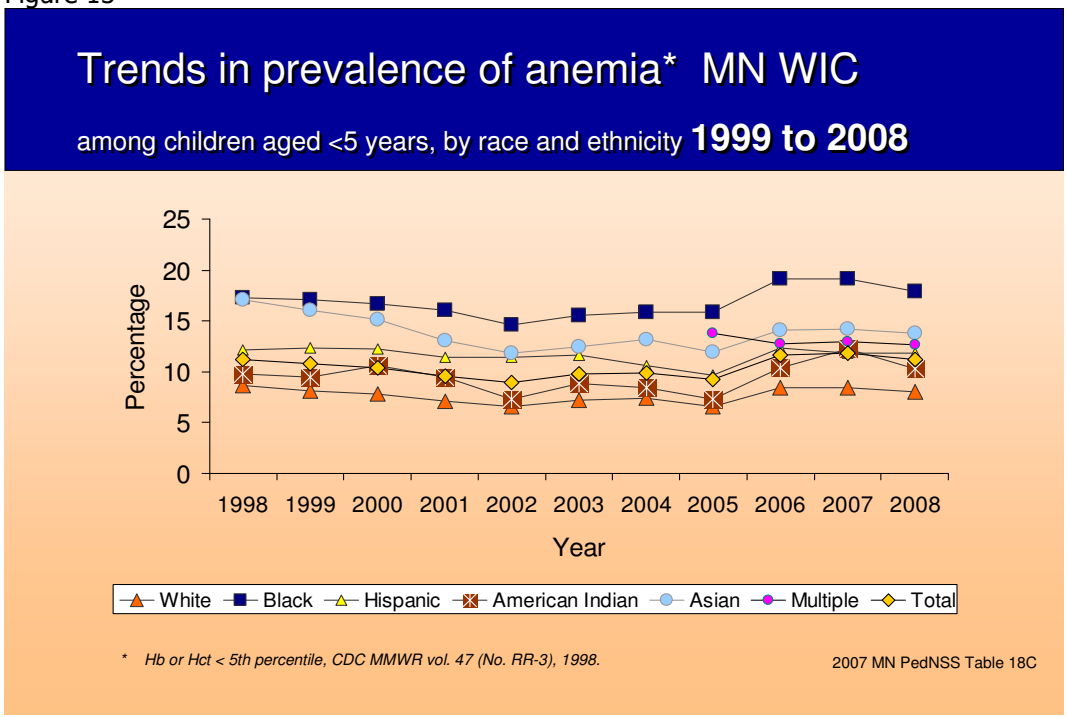
Anemia

Anemia (low hemoglobin/hematocrit) is an indicator of iron deficiency, the most common known nutrient deficiency in the world. Iron deficiency in children is associated with developmental delays and behavioral disturbances[11, 12]. In 2008, the prevalence of anemia among children in the Minnesota WIC program was 11.2%; in the national PedNSS population, it was 14.9%. In both the Minnesota WIC and the national PedNSS population, the highest prevalence of anemia is in children younger than age 2.

As with other health indicators, the prevalence of anemia varies by race and ethnicity in Minnesota. Black/African American children enrolled in the Minnesota WIC program have the highest rate of anemia, and in 2008, the rate of anemia among Black/African American children (17.9%) was more than twice the rate among White non-Hispanic children (8%).

The rates of anemia among MN WIC children, as a whole and by racial and ethnic groups (with the exception of Asian children), have not improved over the previous ten years. (Figure 13)

Figure 13



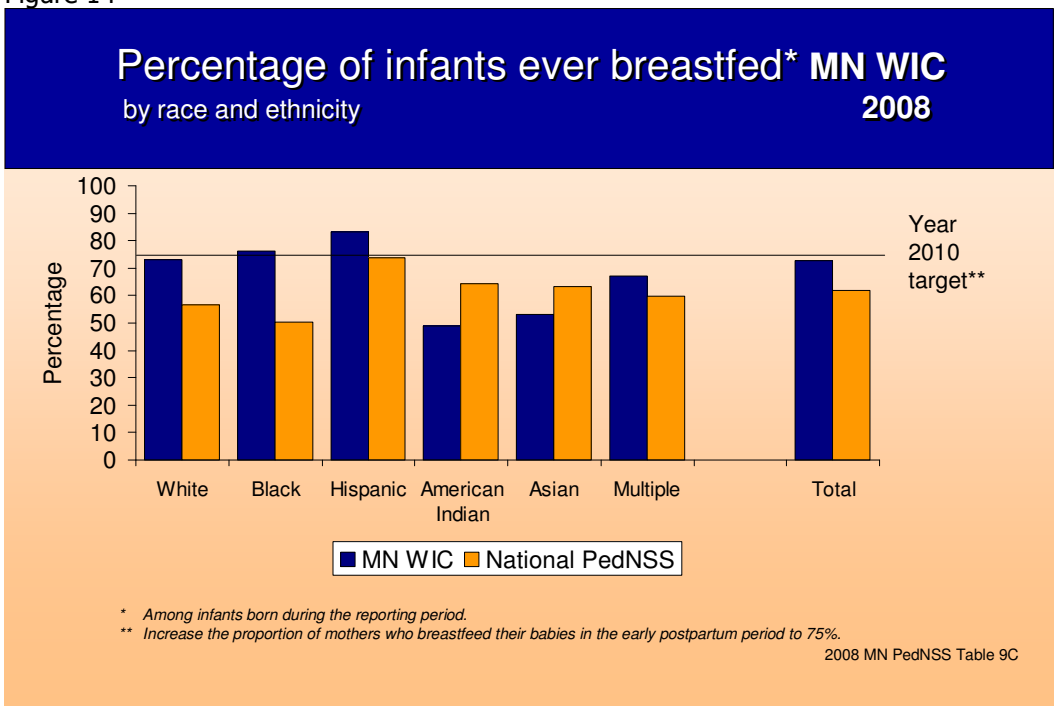
* Anemia is defined using the CDC MMWR Vol. 47 (No. RR3), 1998 as hemoglobin or hematocrit measures less then the 5th percentile. Children aged 1 to 2 years are considered anemic if their hemoglobin (Hb) concentration is less than 11.0 g/dL or their hematocrit (Hct) level is less than 33.0%; children aged 2 to 5 years are considered anemic if their Hb concentration is less than 11.1 g/dL or their Hct level is less than 33.3%. [13]

Breastfeeding - Initiation of Breastfeeding

The benefits -- nutritional, immunologic, allergenic, economic, and psychologic -- of breastfeeding are well known and widely recognized.[14] As such, the *Healthy People 2010* objective (16-19a-c) is to increase the proportion of children "ever breastfed" to 75%; breastfed at 6 months to 50%, and breastfed at 1 year to 25%[5]. By 2008, in Minnesota, 72.9% of WIC infants initiated breastfeeding. Of the infants who initiated breastfeeding, 31.4% were breastfed for at least 6 months and 19.7% were breastfed for at least 12 months.

Nationally representative data from the 2005 National Immunization Survey (NIS) indicate that 74.2% of infants were ever breastfed; 43.1% were still breastfeeding at 6 months, and 21.4% at 12 months.[15] Breastfeeding initiation and duration among Minnesota WIC infants is similar to national data for all women. Rates of initiation among Hispanic and Black/African American infants in Minnesota WIC in 2008, met or exceeded the 2010 goals. (Figure 14)

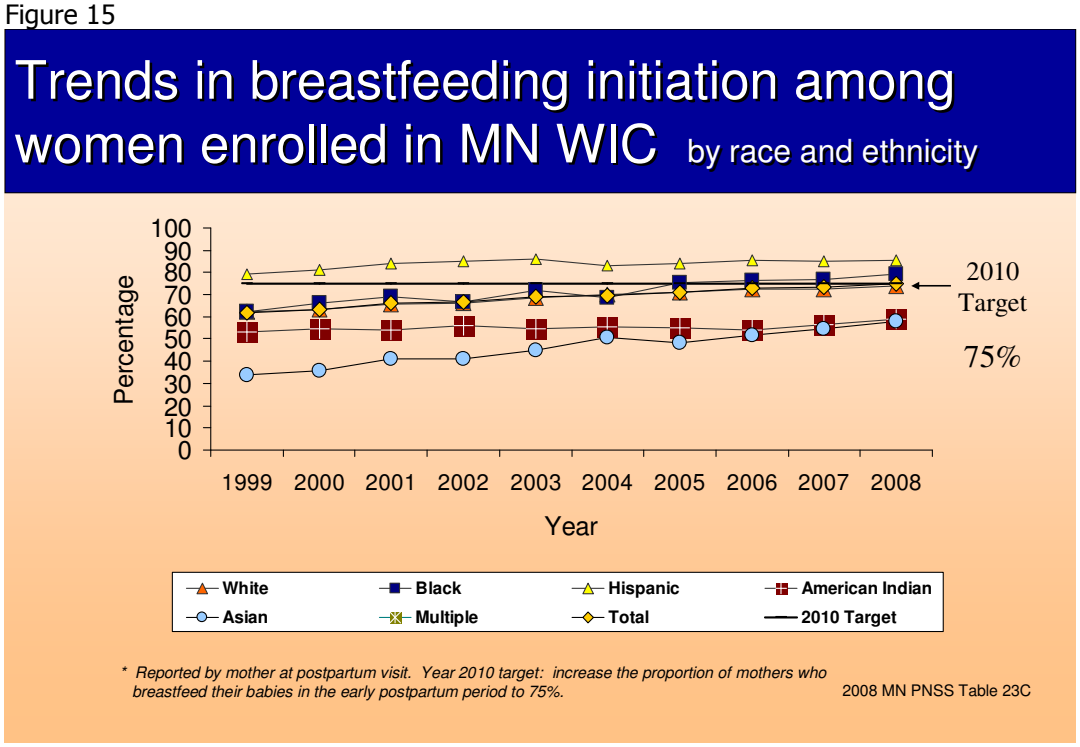
Figure 14



Breastfeeding Initiation has Increased

In the ten-year period from 1999 to 2008, the prevalence of initiating breastfeeding among women enrolled in WIC in Minnesota has increased from 61.7% (1999) to 74.8% (2008). Increases in the number of women initiating breastfeeding are evident among most racial and ethnic groups (Figure 15).

Figure 15

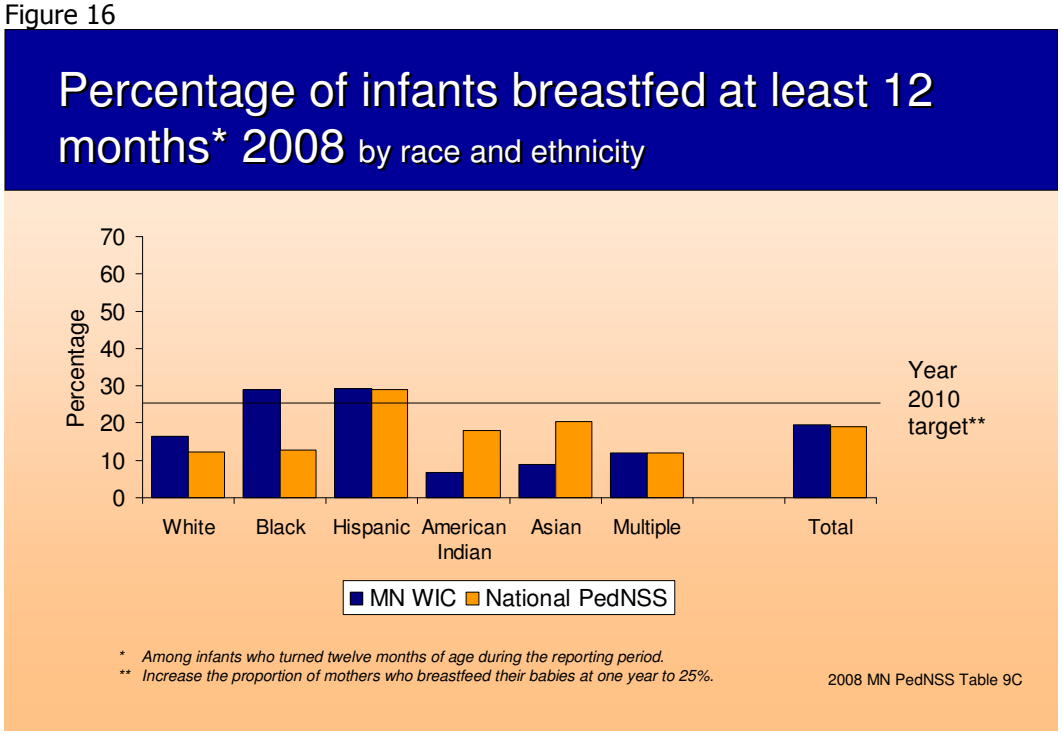


Breastfeeding Initiation Among Women Enrolled in MN WIC			
	1999	**2008**	**% change**
White	62.4%	74.1%	+19%
Black/African American	62.5%	79.1%	+27%
Hispanic	79.2%	85.6%	+ 8%
American Indian	53.3%	58.9%	+11%
Asian	34.0%	58.0%	+71%
Total	61.7%	74.8%	+21%

Breastfeeding Duration

As of 2008, none of the groups in Minnesota WIC met the six-month 2010 target. However, 2008 breastfeeding duration at 12 months is impressive: in the Minnesota WIC population, both Hispanic and Black/African American children surpassed the 2010 goal that 25% of infants who initiate breastfeeding will continue to breastfeed until the infant is at least 12 months. (Figure 16)

Figure 16



It is important to note that while Black/African American infants in the national PedNSS are the least likely to breastfeed, in the Minnesota WIC population they are more likely to breastfeed, and this pattern continues through the 6-month and 12-month mileposts.

The higher rates of initiating breastfeeding and the longer duration among Black/African American women in the Minnesota WIC population may reflect the increasing proportion of African immigrants in Minnesota. Based on Minnesota birth certificate information, 47% of the women identified as African American on the birth certificate were "foreign born" in 2006, while only 4.7% were "foreign born" in 1990.[4]

Infant and Child Health Advances and Concerns

Low-Birth-Weight: The rate of low-birth-weight is higher among MN WIC infants (7.4% in 2008) compared to all Minnesota infants (6.8% in 2008). Further, there is no clear trend toward improvement among infants enrolled in the WIC program in Minnesota. In 2008 among Minnesota WIC infants, none of the racial or ethnic groups met the 2010 goal to reduce low-birth-weight to less than 5%. Additionally, low-birth-weight continues to be disproportionally high among non-Hispanic Black or African American WIC enrollees (10.3%) compared to all Minnesota WIC infants (7.4%).

High-Birth-Weight: Minnesota has higher rates of high-birth-weight compared to national PedNSS population, and only among Asian children in Minnesota is the rate less than the expected rate of 5%. Native American children have much higher rates of high-birth-weight (16.3% in 2008), putting them at higher risk for birth injuries and future risk of overweight and diabetes.

Obesity: Obesity is a major public health problem in Minnesota, as it is nationally. Of note is the possible slowing of the previous increase in rates of overweight and obesity among the Minnesota WIC population. Until 2004, there had been small but consistent increases in the prevalence of obesity each year beginning in 1987 (first year data was available), when the percent of children with BMI $\geq 95^{th}$ percentile for same age and gender children was 8.1%. In 2004 the rate was 13.8%, and since then it has fluctuated around 13%, well above the expected rate of 5%. As is true with other health indicators, there are health risk disparities between racial and ethnic groups.

In Minnesota during 2008, 26.5% of Native American children (aged 2 to 5 years) enrolled in WIC were obese ($\geq 95^{th}$ percentile BMI for age and gender). This is five times the expected rate of 5%.

Anemia: The rates of anemia among Minnesota children enrolled in WIC are above the expected 5% for all race and ethnic groups. During 2008 the rate of anemia among Black/African American children (17.9%) in Minnesota WIC was more than double the rate among White not-Hispanic WIC enrolled children (8.0%). There has been a gradual increase in anemia among Minnesota WIC children since 2002.

Breastfeeding: The bright spot in the 2008 PedNSS data for Minnesota are the trends in breastfeeding. Both initiation and duration are improving in Minnesota WIC children. Breastfeeding initiation rates for Black/African American and Hispanic children in 2008 met the 2010 goal that 75% of children be breastfed at birth. Additionally, trends in breastfeeding duration are improving. Black/African American and Hispanic infants are meeting the 2010 goal that at least 25% of infants who breastfed initially will be breastfed until 12 months.

Pediatric Nutrition Recommendations

The Minnesota PedNSS data indicate that national and state public health programs are needed to support the following actions:

• Implement innovative strategies to reverse the rising trend of overweight in young children by increasing breastfeeding, increasing physical activity, promoting increased consumption of fruits and vegetables, and decreasing television viewing.

• Promote and support breastfeeding through medical care systems, work sites, and communities.

• Promote adequate dietary iron intake and the screening of children at risk for iron deficiency.

• Prevent high and low-birth-weight by providing preconception nutrition care and outreach activities to promote early identification of pregnancy and early entry into comprehensive prenatal care, including the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).

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