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WIC and the Battle Against Childhood Overweight

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One of the most worrisome aspects of the growing tide of obesity in the United States is the high rate of overweight among children. Over one in five young children, ages 2 to 5, are at risk of being overweight—meaning their Body-Mass-Index-for-age is at or above the 85th percentile. These children face both current and long-term health problems, and their numbers have grown in the past two decades (Must and Strauss, 1999). The number of young children whose families participate in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) also grew in that time period, more than doubling from 1.7 million in 1988 to 4.0 million in 2007 (USDA-ERS, 2008).

Are these increases connected? Does WIC participation contribute to the problem of overweight among U.S. children? Although causes of the increase in childhood overweight and obesity are complex, the answer to both questions appears to be "No." Results from data covering almost 20 years show no association between WIC participation and Body Mass Index (BMI) or the probability of being at risk of overweight (see box, "Calculating Body Mass Index," p. 4). However, low-income status, especially for Mexican-American children, does raise the probability of a child's being at risk for overweight.

This brief examines trends in the relationship between WIC participation and weight status by updating the results of *Food and Nutrition Assistance Programs and Obesity: 1976-2002* (ERR-48, Ver Ploeg et al., 2007). That analysis has been updated to include more recently released data from the 2003-2006 National Health and Nutrition Examination Survey (NHANES, 1988-1994 and 1999-2006).

Background and Methodology

The percentage of boys ages 2-5 at or above the 85th percentile of BMI-for-age rose from 15.2 percent to 22.5 percent between 1988-1994 and 1999-2006 (see fig. 1). The increase for girls was smaller, but still sizable, increasing from 16.1 percent to 20.6 percent over the same time period, according to NHANES.

Economic Research Service (ERS) analysts examined the relationship between WIC participation and BMI over the past two decades. Data from the National Health and Nutrition Examination Survey (NHANES) covering the years from 1988-1994 and 1999-2006 were used to explore whether or not there is a relationship between WIC participation and body weight and whether that relationship has been consistent over time as the number of children who participate in the WIC program increased. (The 1988-94 NHANES oversampled Mexican Americans, but not other Hispanic Americans. The sample size does not support separate estimates representative of all Hispanic Americans, only Mexican Americans.)

The analysis compared boys and girls separately. Further, the analysis compared children who reported receiving WIC benefits with children who were income-eligible but did not receive benefits (income less than or equal to 185 percent of Federal poverty guidelines), with children who had moderate income levels (income between 185 and 300 percent of Federal poverty guidelines) and higher income levels (income above 300 percent of poverty).[1] Race, ethnicity, and age were also controlled in the analysis.

[1]The Federal poverty threshold for a family of 4 in 2008 was $21,200 and the 185-percent eligibility limit for WIC was $39,220.

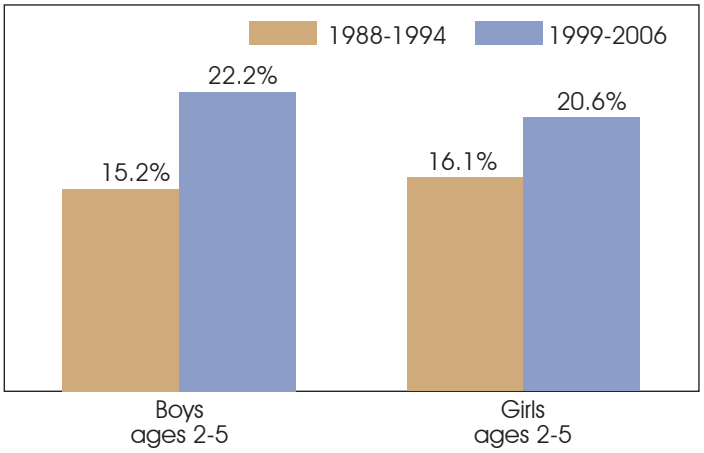
Body Weight Is Not Related to WIC Participation

The only instance in which WIC participation was associated with the probability of overweight was in 1988-1994 for girls—showing that WIC participants were less likely to be at risk of overweight than moderate-income children.

Boys—Estimates for both sets of years of data showed that young boys who received WIC benefits had similar BMI and were as likely to be at risk of overweight as income-eligible nonparticipants. Further, there were no significant differences between WIC participants and higher income nonparticipants.

Figure 1

Children with Body-Mass-Index-for-age at or above the 85th percentile



Source: ERS estimations using National Health and Nutrition Examination Survey data.

Mexican-American boys had significantly higher BMI than non-Hispanic White boys in both 1988-1994 and 1999-2006, even after controlling for income, food stamp participation and age (fig. 2). Mexican-American boys were also more likely to be at risk of overweight than non-Hispanic White boys in 1988-1994, but this difference was no longer statistically significant in 1999-2006. There were no differences between BMI and the probability of being at risk of overweight between non-Hispanic White and non-Hispanic Black boys.

Girls—Girls who received WIC have similar BMI as income-eligible nonparticipants and as higher income nonparticipants. No differences in BMI between these groups were found in either 1988-1994 or 1999-2006. Similarly, there were no differences in the probability of being at risk of overweight across WIC participation and income level. There was one exception, however—1988 to 1994 data show that moderate-income girls were more likely to be at risk of overweight than WIC participants. This difference was no longer present in 1999-2006.

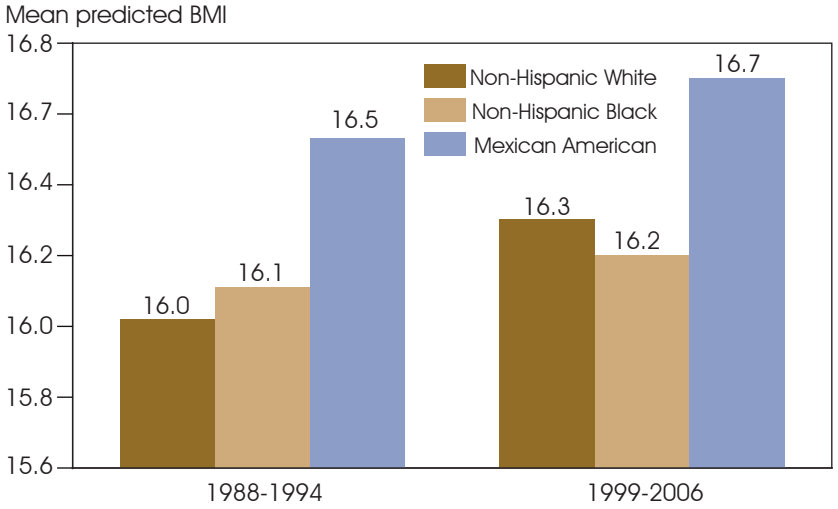
Race and ethnicity were important predictors of BMI and the probability of being at risk of overweight among girls as well.

Compared with non-Hispanic White girls, Mexican-American girls had greater BMI. This result is consistent for both time periods. In 1988-1994, Mexican-American girls were also more likely to be at risk of overweight than non-Hispanic White girls. This difference, however, was not significant in the more recent period, 1999-2006. Non-Hispanic Black girls had similar BMI as non-Hispanic White girls for both survey periods. However, in 1999-2006, non-Hispanic Black girls were more likely to be at risk of overweight than non-Hispanic White girls.

One area for concern among young children regardless of income is that young Mexican-American girls and boys had greater BMI than non-Hispanic White children and non-Hispanic Black children. Figure 2 shows differences in BMI across race and ethnicity for boys in 1999-2006. In 1988-1994, this translated into greater likelihood that young Mexican-American boys would be at risk of overweight than their non-Hispanic White counterparts, but the latest data showed no statistically significant differences for the probability of being at risk of overweight. Another potential area of concern was that in 1999-2006, non-Hispanic Black girls were more likely to be at risk of overweight than non-Hispanic White girls.

Figure 2

Mean BMI by race/ethnicity for boys ages 2-4 who were enrolled in WIC, 1988-1994 and 1999-2006



Note: Differences among groups and between years are not statistically significant.
Source: ERS estimations based on regressions of BMI on age, race/ethnicity, WIC, and income status.

Although these results do not show evidence of a relationship between WIC participation and body weight, ERS analysis methods cannot ascribe (or deny) causal links between WIC participation and overweight status. Selection bias may exist because families and individuals who choose to participate in food assistance programs may be systematically different in unobservable ways from those who do not participate.

Conclusions

The WIC program appears not to be a major cause of the childhood obesity problem, but the program could be part of the solution. WIC could be used as a tool to combat the problem of overweight among children, at least for those low-income children whom the program primarily serves. By October 1, 2009, the WIC program must implement recently approved changes to the types and amounts of foods the program offers, including a voucher for the purchase of fruits and vegetables.

State WIC agencies now are implementing the changes in the types and quantities of foods that can be purchased through WIC. The new WIC food package for children 2 years and older eliminates whole milk and makes available only lower fat milk, reduces the maximum monthly amount of juice and eggs, adds whole-wheat bread, and includes a voucher for $6 per month to buy fruits and vegetables. Such changes could be important for reducing the risk of obesity if they encourage consumption of more fruits and vegetables and lower fat milk while reducing consumption of less healthy foods.

The revisions to the food package also attempt to encourage breastfeeding. The changes include:

- making the food package for postpartum women who exclusively breastfeed relatively more generous than the food package for partially breastfeeding and nonbreastfeeding postpartum women (offering more juice, milk, eggs, whole-wheat bread, canned fish, and offering a $10 voucher for

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Group of children, Digital Vision; mother and child, baby in shopping cart, Shutterstock.

fruits and vegetables compared with an $8 voucher for partially breastfeeding and nonbreastfeeding women).

- eliminating the provision of infant formula for fully breastfed infants
- reducing the amount of formula provided for partially breastfed infants

If these revisions are successful in promoting breastfeeding, a longer term impact of reducing childhood obesity could occur, since breastfeeding may protect babies against becoming obese later in life (Arenz et al., 2004). Future research and evaluation should assess the effectiveness of these policy innovations in changing dietary patterns, as well as others that may be proposed as a way to reduce the prevalence of child obesity.

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Calculating Body Mass Index

Body Mass Index (BMI) is a function of weight and height. In English units, it is measured as pounds divided by inches squared, multiplied by 703.

Adults

As an example, a 5-foot, 5-inch (65 inches) adult weighing 150 lbs would calculate his BMI by: dividing 150 by $(65)^2$ and multiplying the result by 703, for a BMI of 24.96. That is just within the high end of the healthy-weight range, as shown below.

BMI < 18.5 = underweight
18.5 ≤ BMI < 25 = "normal" or healthy weight
25.0 ≤ BMI < 30 = overweight
BMI ≥ 30.0 = obese

Children

For children, the calculation is more complex, involving date of birth (month/day/year), date of measurement (month/day/year), gender, height (to nearest one-eighth of an inch), and weight (to nearest one-quarter of a pound). That number is placed on a Centers for Disease Control and Prevention BMI-for-age percentile chart that places the child within a BMI range for the child's peers.

As an example, the BMI calculated for a 7-year-old girl who weighs 55 pounds and is 48 inches tall would be done the same way as an adult's BMI. The result, a BMI of 16.8, would be placed on the CDC chart, showing she is just above the 75th percentile, meaning her BMI is higher than 75 percent of girls her age in the United States.

Children and adolescents ages 2-19

BMI < 5th percentile of BMI-for-age = underweight
5th percentile of BMI-for-age < BMI < 85th percentile BMI-for-age = healthy weight
85th percentile BMI-for-age < BMI < 95th percentile BMI-for-age = at risk of overweight
BMI > 95th percentile of BMI-for-age = overweight

To calculate specific BMIs for adults, children, and teens, see:
http://www.cdc.gov/nccdphp/dnpa/healthyweight/assessing/bmi/index.htm

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