United States Department of Agriculture

Economic Research Service

Nutrition and Health Characteristics of Low-Income Populations

Body Weight Status

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The prevalence of overweight and obesity in the United States has increased dramatically over the past 3 decades (Ogden et al., 2002; Flegal et al., 2002). In 1999-2000, 65 percent of adults and 15-16 percent of children ages 6-19 were overweight (NCHS, 2003). Overweight children often become overweight adults, and overweight in adulthood increases the risk of developing many diseases, including type 2 diabetes, high blood pressure, coronary heart disease, stroke, gallbladder disease, respiratory problems, osteoarthritis, sleep apnea, and some types of cancer (Ogden et al.).

Adults have traditionally been classified as overweight based on life insurance mortality data and data relating weight status to morbidity and mortality. For adults, a body mass index (BMI), which is a ratio of body weight (in kilograms) to height squared (in meters), is used to define body weight status. A BMI of less than 18.5 is classified as underweight, a BMI at or greater than 18.5 and less than 25 is healthy weight, overweight has a BMI at or greater than 25 and less than 30, and a BMI at or over 30 is obese. The Centers for Disease Control and Prevention (CDC) has issued a series of growth charts for assessing children's body weight, including the BMI-for-age chart (ages 2 and over), the weight-for-length chart (birth through 3 years), and the weight-for-height chart (2-5 years). A child with a BMI-for-age or weight-for-height below the 5th percentile is classified as underweight, at and above the 85th percentile and less than the 95th percentile is classified as at risk of being overweight, and at or above the 95th percentile is classified as overweight. The word "obesity" is not used with children because of negative connotations.

The Nutrition and Health Characteristics of Low-Income Populations study examined several measures of body weight status for children and adults using 1988-94 National Health and Nutrition Examination Survey (NHANES) data. The measures provide a baseline to monitor the weight status of Americans, focusing on the low-income population.

Food Stamp Program (FSP) Participants

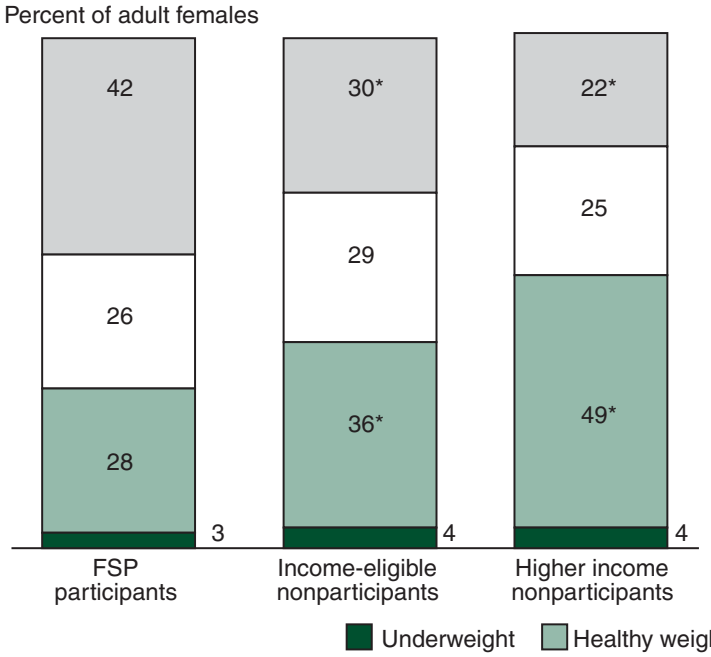
The FSP income eligibility cutoff (130 percent poverty level) separates nonparticipants into income-eligible and higher income nonparticipants. Among children ages 2-19, FSP participants and income-eligible nonparticipants did not differ in terms of mean BMI or the proportion of children at risk of being overweight or who actually were overweight. Compared with higher income children, however, FSP children were heavier (19.8 vs. 19.2 in BMI) and were more likely to be overweight (12 percent vs. 9 percent). These differences were concentrated among 12- to 19-year-old females. FSP females of this age group were heavier than their higher income counterparts (23.7 vs. 21.8 in BMI) and were almost twice as likely to be at risk of being overweight or actually overweight.

Adult FSP participants had a greater mean BMI than either income-eligible or higher income nonparticipants, and the differences were entirely attributable to differences among women. With a larger BMI, FSP women were less likely than income-eligible and higher income women to be at a healthy weight and more likely to be obese (fig. 1). No difference was observed for the prevalence of overweight among these three groups of women. The pattern observed for men is notably different. FSP men and income-eligible nonparticipating men did not differ in BMI. Compared with higher income men, however, FSP men were more likely to be at a healthy weight and less likely to be overweight.

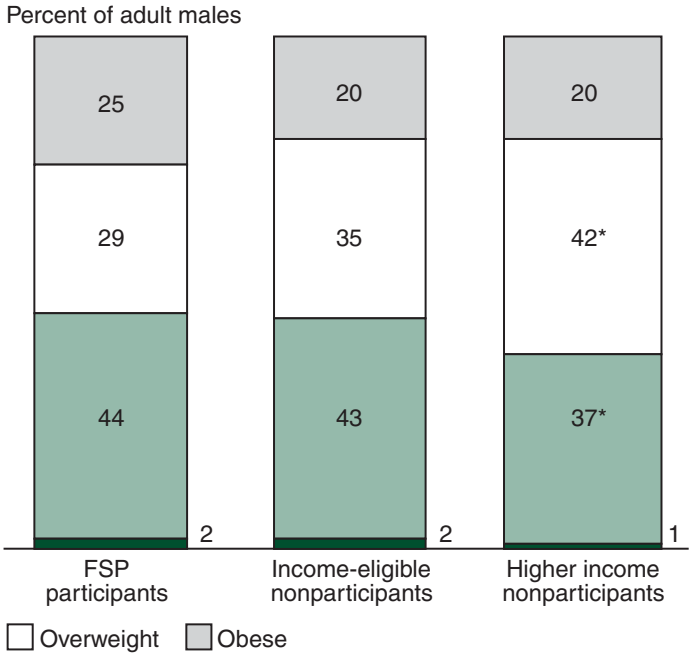
NHANES adult respondents were asked "Do you consider yourself now to be overweight, underweight, or about the right weight?" More than three-quarters (77 percent) of adults who were overweight/obese had an accurate perception of their weight status, with a larger proportion of women (89 percent) than men (66 percent) being able to recognize their weight problem. A smaller proportion of overweight/obese FSP women recognized their weight problem than income-eligible and higher income women did (79 percent vs. 85 percent and 92 percent). No such differences were observed among men. Overall, 25 percent of adults with healthy weight perceived themselves to be overweight. Healthy-weight men were less likely to perceive

Figure 1

Food Stamp Program female participants are more likely to be obese than other women



Food Stamp Program male participants are more likely to be obese than other men



Underweight Healthy weight Overweight Obese

*Statistically significant difference from FSP participants at the 0.05 level or better.
Source: National Health and Nutrition Examination Survey, 1988-94.

themselves to be overweight than healthy-weight women (11 percent vs. 38 percent). FSP participants who were at a healthy weight were less likely than higher income nonparticipants to perceive themselves as overweight (14 percent vs. 27 percent). This pattern was observed for both men and women.

Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)

The WIC program serves infants and children under the age of 5. Because BMI-for-age is not applicable to children ages 2 and under, weight-for-height is used to assess the weight status of WIC children against nonparticipants. The WIC program also serves pregnant, postpartum, and breastfeeding women, but weight status for these women is not examined because of data limitations and lack of appropriate weight cutoffs. The WIC income cutoff of 185 percent poverty level is used to separate nonparticipants into income-eligible and higher income groups. Overweight and underweight are two recognized nutrition risk criteria for qualifying children for WIC participation.

Among 1- to 4-year-old children, there was no difference between the three groups in the prevalence of at risk of being overweight (11 percent, overall). Also, no difference was observed between WIC children and income-eligible children in the prevalence of overweight (7-8 percent). However, WIC children were more likely to be overweight than higher income children (7 percent vs. 4 percent). WIC children were more likely than income-eligible children to be underweight (7 percent vs. 3 percent). There was no difference between WIC children and higher income children in the prevalence of underweight.

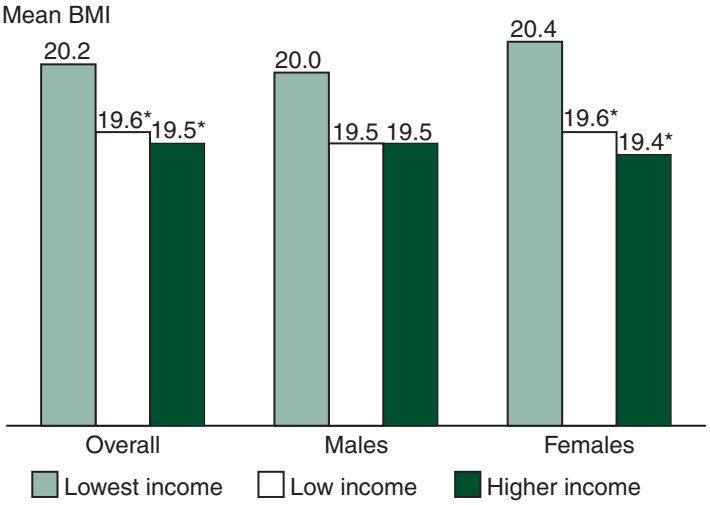
School-Age Children

Children ages 5-18 who were in school during the survey period were included in this study. They are grouped into three income classes: the lowest income (family income not exceeding 130 percent poverty level), low income (131-185 percent poverty), and higher income (above 185 percent). These income cutoffs correspond to income eligibility to participate in FSP, WIC, and free and reduced-price school meals.

On average, children in the lowest income group had a greater BMI than children in either of the other income groups (fig. 2). The difference is concentrated among girls, with the lowest income girls having a mean BMI of 20.4, higher than 19.6 and 19.4 for the low- and higher income girls. Differences between girls in the lowest income group and the higher income group are attributable to differences among 11- to 13-year-olds (21.4 vs.19.8) and 14- to 18-year-olds (23.8 vs. 21.7).

Overall, there are no differences between the three income groups in the prevalence of at risk of being overweight, for either boys or girls ages 5-18. (Note that 2- to 19-year-old children who participated in the Food Stamp Program were found to be heavier than their higher income counterparts, mainly because of the differences among 12- to 19-year-old females.) There are some variations in weight status among school-age children by age. Among the youngest cohort of school-age children (5- to

Figure 2
Mean BMI among school-age children, age adjusted

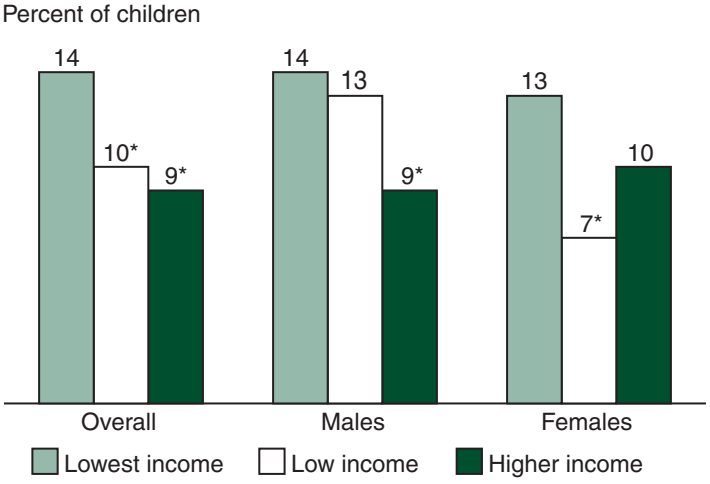


*Statistically significant difference from lowest income group at the 0.05 level or better.
Source: National Health and Nutrition Examination Survey, 1988-94.

10-year-olds), children in the lowest income group were more likely than children in the low-income group to be at risk of being overweight (13 percent vs. 8 percent). Among 11- to 13-year-olds, the lowest income children were more likely than higher income children to be at risk of being overweight (22 percent vs. 13 percent). This difference is concentrated among girls (22 percent vs. 12 percent).

Children in the lowest income group were more likely to be overweight than children in the low- and higher income groups (fig. 3). There are notable differences by gender. The only difference among boys is observed between the lowest income and higher income groups, whereas girls in the lowest income group were almost twice as likely as girls in the low-income group to be overweight.

Figure 3
Prevalence of overweight among school-age children, ages 5-18, age adjusted



*Statistically significant difference from lowest income group at the 0.05 level or better.
Source: National Health and Nutrition Examination Survey, 1988-94.

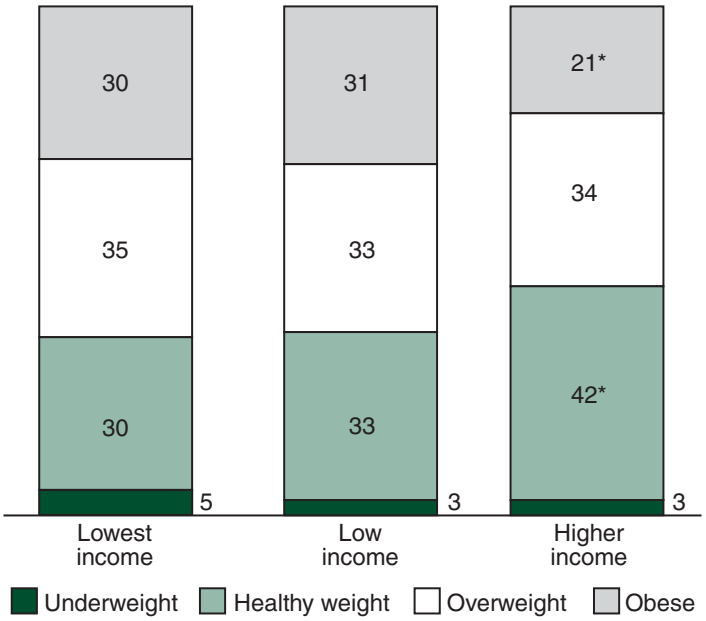
Older Americans

Adults ages 60 and older were classified into three income classes, identical to the income classification for school-age children. On average, older adults had a mean BMI of 26.7, above the overweight cutoff. Men and women had similar BMI, and their BMI tended to decrease with age. Consequently, the proportion of older Americans with healthy body weights increased and the prevalence of overweight and obesity in general decreased with age.

Older adults in the lowest income and low-income groups were similar in their BMI, for both men and women. However, older adults in the lowest income group were heavier than their counterparts in the higher income group (27.3 vs. 26.5 in BMI). This was caused by differences among females between the two income groups (27.7 vs. 26.3). Consequently, older females in the lowest income group were more likely than older females in the higher income group to be obese (fig. 4). Thirty percent of older females in the lowest income group were obese, compared with 21 percent of older females in the higher income group. Only 30 percent of older females in the lowest income group were at a healthy weight, compared with 42 percent of older females in the higher income group. Rates of overweight and underweight were comparable for the two groups. A different pattern was noted for men. Specifically, older men in the lowest income group were less likely than older men in the higher income group to be overweight and more likely to be underweight (fig. 5).

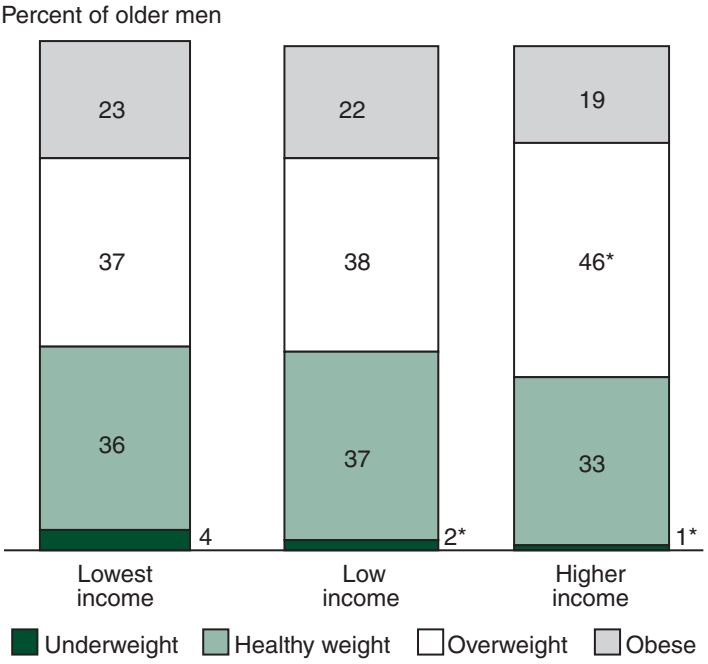
The data reveal that about two out of three (65 percent) overweight/obese older adults had an accurate perception of their

Figure 4
Weight status of older women, age 60 and older, age adjusted



*Statistically significant difference from lowest income group at the 0.05 level or better.
Source: National Health and Nutrition Examination Survey, 1988-94.

Figure 5
Weight status of older men, ages 60 and older, age adjusted



*Statistically significant difference from lowest income group at the 0.05 level or better.
Source: National Health and Nutrition Examination Survey, 1988-94.

weight problem, and the accuracy decreased with age. Overall, 77 percent of overweight/obese adults between 60 and 64 perceived themselves to be overweight, compared with 40 percent of overweight/obese adults 85 years and older. Among overweight/obese older adults, a larger proportion of women (73 percent) recognized their weight problem than men (53 percent). Overweight/obese women in the lowest income group were less likely than their counterparts in the other two income groups to have an accurate perception of their body weight. Among healthy weight older adults, individuals in the lowest income group were more likely than individuals in the higher income group to have an accurate perception of their body weight. That is, healthy weight older adults in the lowest income group were less likely than healthy weight older adults in the higher income group to perceive themselves as being overweight.

Information Sources

Flegal K.M., M.D. Carroll, C.L. Ogden, and C.L. Johnson. (2002). "Prevalence and trends in obesity among U.S. adults, 1999-2000." *J. American Medical Assoc.* 288:1723-27.

Ogden C.L., K.M. Flegal, M.D. Carroll, C.L. Johnson (2002). "Prevalence and trends in overweight among U.S. children and adolescents, 1999-2000." *J. American Medical Assoc.* 288:1728-32.

National Center for Health Statistics (NCHS) (2003). *Health, United States, 2003 with Chartbook on Trends in the Health of Americans.* Hyattsville, MD.

Centers for Disease Control and Prevention (2003). "CDC Growth Chart Training Modules." Accessed May 2003, from: www.cdc.gov/nccdphp/dnpa.

Troiano, R.P., and K.M. Flegal (1998). "Overweight children and adolescents: Description, epidemiology, and demographics," *Pediatrics* 101:497-504.

For more information, see www.ers.usda.gov/publications/efan04014-1, 04014-2, 04014-3, 04014-4

NOTE: These studies were not designed to assess program impacts. Do not interpret any reported differences between program participants and nonparticipants as impacts of food assistance programs.