

## Body Weight Status of Adults: United States, 1997–98

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### Abstract

**Objective**—This report presents estimates for underweight, healthy weight, overweight, and obesity for U.S. adults aged 18 years and over. Based on self-reported height and weight, data are shown for selected population subgroups for both sexes and for men and women separately.

**Methods**—Body weight status of U.S. adults was estimated using data from the 1997–98 National Health Interview Survey (NHIS) for 68,556 adults aged 18 years and over and Body Mass Index (BMI) (weight/height<sup>2</sup>) criteria established by the World Health Organization (WHO). The NHIS is administered in households throughout the United States using computer-assisted personal interviews (CAPI). The combined overall response rate in 1997–98 was 77.2%. Statistics shown in this report were age adjusted to the 2000 projected U.S. population.

**Findings**—Over one-half of adults (54.7%) were overweight and 1 in 5 (19.5%) were obese in 1997–98. Women (49.5%) were more likely than men (36.3%) to be of healthy weight although men and women were equally likely to be obese. Obesity was most prevalent among middle-aged adults, among black non-Hispanic adults and Hispanic adults, and among adults with less education and lower income. Rates of obesity by marital status differed by gender: married men (20.4%) had higher rates of obesity than separated and divorced men (16.8%), and married women (18.4%) had lower rates of obesity than separated and divorced women (23.2%). Obesity was lowest among adults living in the West and those living in a metropolitan statistical area (MSA), but outside the central city (i.e., the suburbs).

**Conclusions**—Overweight and obesity were widespread in the United States in 1997–98 and prevalence varied significantly by population subgroup.

**Keywords:** Body Mass Index (BMI) • body weight • obesity • overweight • healthy weight • underweight • National Health Interview Survey

### Introduction

Obesity and overweight have increased markedly in the United States over the past four decades (1,2). The dramatic rise in the prevalence of obesity and overweight is not limited to

the United States. Although populations in many countries in North America and Europe have a substantial prevalence of overweight, the problem exists in nearly every region of the world. In 1997, a WHO Expert Technical Consultation

addressed the issue of the health consequences of overweight and obesity (3). Criteria for identifying varying degrees of overweight have been agreed upon by the WHO and are being used to assess the magnitude and implications of this emerging world health problem.

According to the recently released Surgeon General's Call to Action, obesity and overweight will soon rival cigarette smoking as a leading cause of premature death and disability in the United States (4). Epidemiologic evidence suggests that overweight and obesity are associated with a variety of serious health conditions, including Type 2 diabetes, stroke, heart disease, gallbladder disease, several types of cancer, breathing problems, asthma, sleep apnea, and osteoarthritis (5). An estimated 300,000 deaths a year may be attributable to obesity (6). A prospective study of more than a million U.S. adults found that among nonsmokers with no history of disease, risk of death was positively associated with degree of overweight and obesity (7). Extreme leanness (i.e., underweight) was also associated with overall mortality risk in the same population (7).

The National Health Interview Survey (NHIS), one of the major data collection systems of the Centers for Disease Control and Prevention's (CDC) National Center for Health Statistics (NCHS) is a large, population-based

survey of the U.S. civilian noninstitutionalized population. The NHIS has included questions on reported height and weight in the basic household interview since 1978 and as a special topic supplement in selected years since 1974 (8,9).

Since the redesign of the NHIS in 1997, questions related to height and weight have been part of the Sample Adult and Sample Child NHIS annual core questionnaires. This report focuses exclusively on adults. Height and weight data are collected in the NHIS for the purpose of studying the associations between relative body weight status (that is, underweight, healthy weight, overweight, and obesity) and a variety of other health characteristics, including health limitations, chronic conditions, injuries, access to and use of health services, and other health-related behaviors. Annual prevalence estimates from the NHIS also assist in identifying sociodemographic variations in body weight, providing much needed information to identify the most appropriate target groups for health promotion and education campaigns.

This report, the third in a series of reports on adult health behaviors, presents prevalence estimates of obesity, overweight, healthy weight, and underweight for a variety of population subgroups. Previously published reports showed estimates of alcohol use (10) and leisure-time physical activity (11). The fourth report in the series will examine sociodemographic differentials in cigarette smoking behavior. Together, these reports will contribute to a health behavior profile of the U.S. adult population that will serve as a foundation for future studies of the association between health behaviors and a variety of other health characteristics.

## Methods

### Data source

The statistics in this report are based on data from the Sample Adult component of the 1997 and 1998 National Health Interview Surveys (NHIS) (12,13). The NHIS is a survey of a nationally representative sample of

the civilian noninstitutionalized household population of the United States. Basic health and demographic information are collected on all household members, by proxy if necessary. Additional information is collected on one randomly sampled adult aged 18 years or over and one randomly sampled child aged 0–17 years per family. Information on the sample adult is self-reported except when the sample adult is physically or mentally incapable of responding, and information on the sample child is collected from an adult who is knowledgeable about the child's health.

The NHIS has been in the field continuously since 1957. About every 10 years, the survey has undergone a redesign of its content to keep pace with changing data needs. In 1997, the survey underwent its most extensive revision to date, changing not only the questionnaire content and structure, but also the mode of administration (i.e., computer-assisted personal interviewing) and data processing procedures. Two important features of the new NHIS are (a) the core questionnaire now covers a wider range of health topics than earlier designs, and (b) more information is available on the sociodemographic characteristics of respondents. Detailed information about the 1997 design is available elsewhere (14).

### Measurement of body weight

Height and weight were used to compute body mass index (BMI), which is a measure of body weight relative to height. The BMI was computed using respondent-reported height and weight (without shoes). In the 1997 NHIS, U.S. customary measures (height in feet and inches and weight in pounds) were the only reporting options and were converted to metric units after data collection. Beginning in 1998, a metric option was introduced for those respondents who felt more comfortable reporting in centimeters and kilograms.

*Body Mass Index* is based on metric units and is defined as weight divided by height<sup>2</sup> (i.e., kilograms/meter<sup>2</sup>). The categories of BMI used in this report are consistent with standard BMI classifications used by the World Health

Organization (WHO) and the 2010 National Health Objectives. *Overweight* adults had a BMI of 25 or more (table 1). *Obese* adults had a BMI of 30 or more; *overweight, but not obese* adults had a BMI of at least 25 and less than 30; *healthy weight* adults had a BMI of at least 18.5 and less than 25; and *underweight* adults had a BMI of less than 18.5 (table 2). Tables 1 and 2 show categories for body weight status with the BMI equivalents listed in footnotes in each table. See the Technical note at the end of this report for question wording and discussion of additional measurement issues.

### Strengths and limitations of the data

A major strength of the data on height and weight in the NHIS is that they are collected annually for a nationally representative sample of U.S. adults, allowing estimation of body weight status for a wide variety of population subgroups. Because the data are collected annually, it is now possible to produce annual estimates for obesity and overweight and to track changes in prevalence over time. The inclusion of height and weight in the survey every year also means that data years can be combined to produce reliable estimates for smaller population subgroups and to better study the association between body weight and a wide range of other self-reported health characteristics that are included in the NHIS. These health characteristics include other health behaviors, chronic health conditions, injury episodes, access to medical care, and health insurance coverage.

The height and weight questions and the associated BMI measure have at least three limitations: First, they are dependent on respondents' knowledge of their current height and weight. Adults may not have been weighed or had their height measured for some time. Weight can vary substantially over a period of time, and height (although somewhat less subject to change) can diminish with age. Second, accurate height and weight are dependent on respondents' willingness to report each accurately. Studies have suggested that respondents tend to underreport weight and

overreport height (15–17). Finally, although BMI is significantly correlated with total body fat content for the majority of individuals, BMI may overestimate body weight in persons who are very muscular or underestimate body weight in persons who have lost muscle mass, such as the elderly (4).

### Statistical analysis

Two years of data were combined to obtain reliable estimates for some of the smaller population subgroups. Even with the 2 years of data, the standard errors for some subgroups are large. In [tables 1 and 2](#), estimates with a relative standard error of more than 30% are identified with an asterisk. The reader should exercise caution when interpreting these statistics. This report is based on data from 68,556 completed interviews with sample adults aged 18 years and over, representing an overall sample adult response rate of 77.2%. Procedures used in calculating response rates are described in detail in appendix I of the Survey Description of the NHIS data files (12,13).

All estimates and associated standard errors shown in this report were generated using SUDAAN, a software package designed to handle the complex sample design used by the NHIS (18). All estimates were weighted to reflect the U.S. civilian noninstitutionalized population aged 18 years and over.

Most estimates presented in [tables 1 and 2](#) were age adjusted to the 2000 projected U.S. population aged 18 years and over. Age adjustment was used to allow comparison among various sociodemographic subgroups that have different age structures (19,20). (See Technical Notes for details.) For the population totals as well as for many of the sociodemographic subgroups, the age-adjusted and unadjusted estimates were similar. Tables showing unadjusted estimates by race/ethnicity, education, poverty status, marital status, geographic region, and location of residence are available on the NCHS Web site (21).

Age-adjusted estimates were compared using two-tailed *t*-tests at the 0.05 level. No adjustments were made for multiple comparisons. Terms such as

“greater than” and “less than” indicate a statistically significant difference. Terms such as “similar” or “no difference” indicate that the statistics being compared were not significantly different. Lack of comment regarding the difference between any two statistics does not mean that the difference was tested and found to be not significant.

With the exception of information on place of residence (MSA versus non-MSA), which is not available to the public for reasons of confidentiality, all statistics presented in this report can be replicated using NHIS public-use data files and accompanying documentation available for downloading from the NCHS Web site at <http://www.cdc.gov/nchs/nhis.htm>.

### Results

Findings from [tables 1 and 2](#) and [figures 1–5](#) are summarized in bulleted highlights organized according to population characteristics. Statistics are cited in the bullets whenever their mention will enhance understanding. In some instances, especially when more general interpretations of the findings are presented, the reader will need to refer to the table for the exact estimates. With the exception of the section describing findings by age, all descriptions refer to age-adjusted estimates.

The race-ethnicity variables shown in [tables 1 and 2](#) identify persons of Hispanic origin as one category but further categorize persons not of Hispanic origin by race. While persons of Hispanic origin can be of any race, there is insufficient sample size to produce reliable estimates by race for the Hispanic population. Data for non-Hispanic persons of races other than white, black, and Asian/Pacific Islander are not shown separately due to small sample sizes and associated large standard errors that made it difficult to interpret findings for these other groups.

This report describes estimates for all adults and highlights the most striking subgroup differences. The tables contain an enormous amount of information beyond that described. Readers with interests in particular subgroups or aspects of the study of

body weight are encouraged to examine the tables for findings pertinent to their interests.

### All adults

- Overall, more than one-half (54.7%) of adults were overweight ([table 1](#)).
- About 20% of adults were obese ([table 2](#)).
- About 4 in 10 adults (43.0%) were in the healthy weight range ([table 2](#)).
- About 2% of adults were underweight ([table 2](#)).

### Sex

- Men (62.7%) were considerably more likely than women (46.9%) to be overweight ([table 1](#)).
- No differences between men and women were found in the prevalence of obesity ([table 2](#), [figure 1](#)).
- Women (49.5%) were significantly more likely than men (36.3%) to be of healthy weight ([table 2](#), [figure 1](#)).
- Women (3.6%) were about four times as likely as men (0.9%) to be underweight ([table 2](#), [figure 1](#)).

### Age

- Adults aged 18–24 years (37.5%) were significantly less likely than adults of other ages to be overweight ([table 1](#)).
- Among adults aged 45–64 years, about 7 in 10 men (71.5%) and almost 6 in 10 women (55.7%) were overweight ([table 1](#)).
- Men aged 45–64 years (23.8%) were about twice as likely as the youngest men (12.7%) and the oldest men (10.0%) to be obese ([table 2](#), [figure 2](#)).
- Among women, the prevalence of obesity was highest for those aged 45–64 years of age (24.7%) and lowest for those 18–24 years of age (12.9%) ([table 2](#), [figure 2](#)).
- The youngest adults and the oldest adults were about twice as likely as adults in other age groups to be underweight ([table 2](#)).

### Race/ethnicity

- Black non-Hispanic adults (65.5%) and Hispanic adults (61.6%) were about twice as likely as Asian or

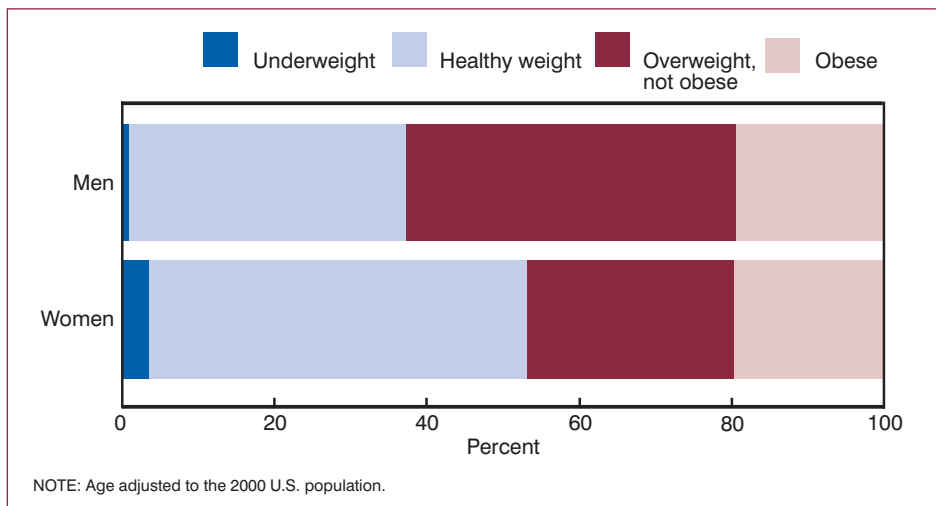


Figure 1. Percent distribution of body weight status by sex: United States, 1997-98

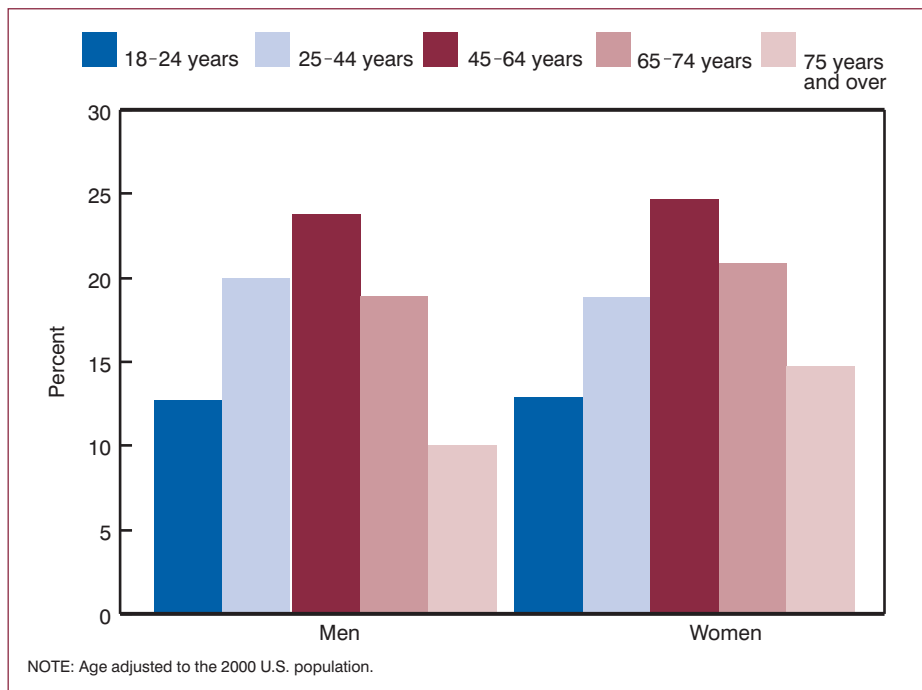


Figure 2. Percent of adults who were obese, by age and sex: United States, 1997-98

- Pacific Islander non-Hispanic adults (31.6%) to be overweight (table 1).
- Slightly more than one-half of white non-Hispanic adults (53.0%) were overweight (table 1).
- Among black non-Hispanic adults, prevalence of overweight was about the same for men (65.7%) as for women (65.2%). In the other race-ethnic groups studied, prevalence of overweight was higher for men than for women (table 1, figure 3).
- Prevalence of obesity was highest among black non-Hispanic adults

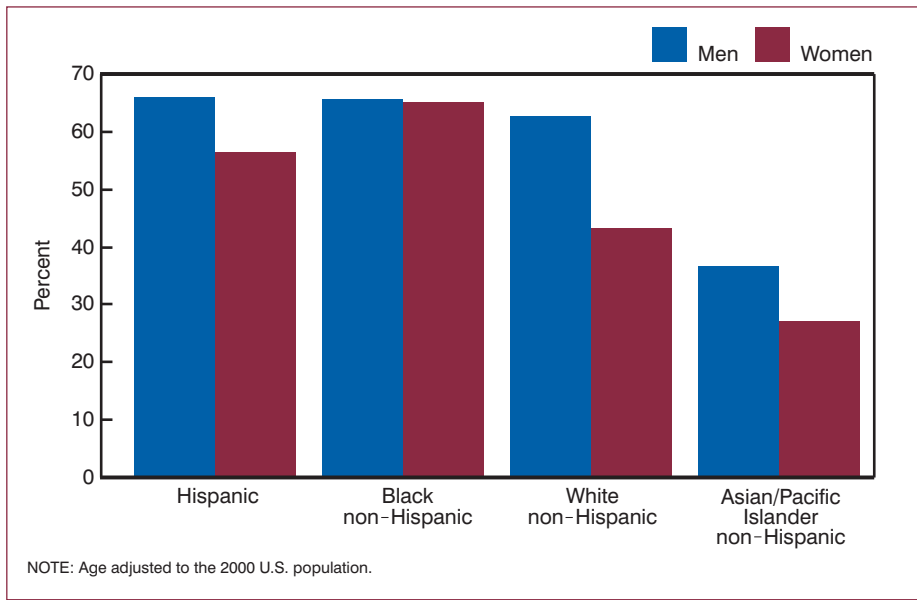
- (29.0%) and lowest among Asian/Pacific Islander non-Hispanic adults (6.3%) (table 2).
- Hispanic adults (22.6%) were more likely than white non-Hispanic adults (18.2%) to be obese (table 2).
- About one-third of black non-Hispanic women (32.9%) and one-fourth of Hispanic women (23.3%) were obese compared with 17.6% of white non-Hispanic women and 5.8% of Asian/Pacific Islander non-Hispanic women (table 2).

- Asian/Pacific Islander non-Hispanic adults (62.3%) were significantly more likely than adults of other race and ethnic backgrounds to be of healthy weight (table 2).
- White non-Hispanic adults (44.6%) were more likely than Hispanic adults (37.0%) and black non-Hispanic adults (33.1%) to be of healthy weight (table 2).
- Asian/Pacific Islander non-Hispanic women (9.9%) were considerably more likely than white non-Hispanic women (3.8%), black non-Hispanic women (2.0%), and Hispanic women (1.9%) to be underweight (table 2).

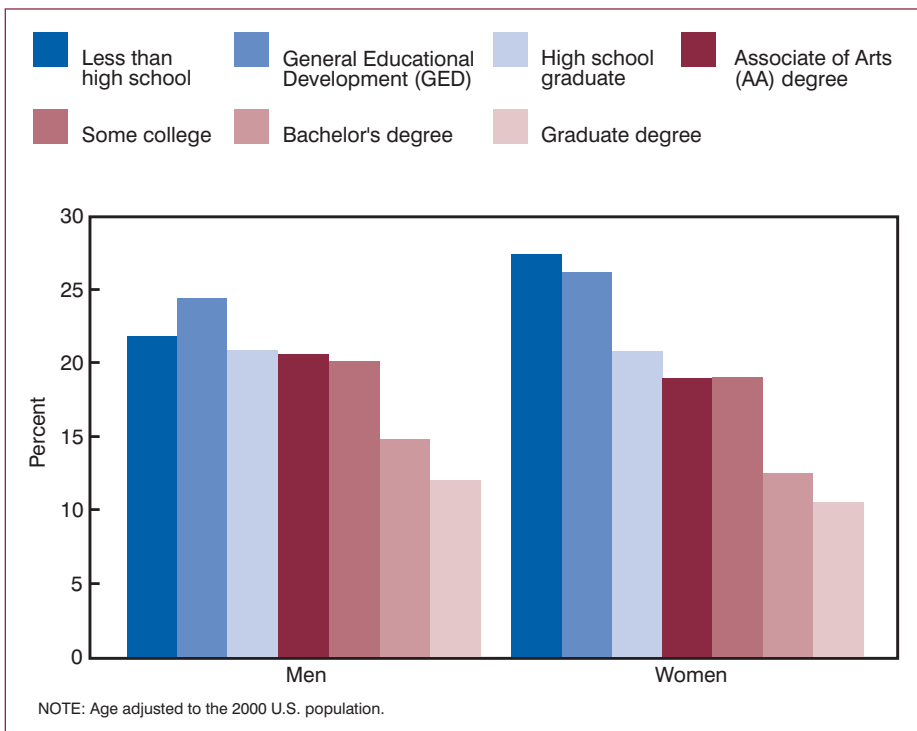
## Education

- About 6 in 10 adults (60.4%) with less than a high school diploma compared with 4 in 10 adults (42.4%) who had a graduate degree were overweight (table 1).
- Men were more likely than women at each education level to be overweight (table 1).
- The prevalence of obesity decreased with education; one-fourth of adults with less than a high school diploma (24.7%) compared with about one-tenth of adults with a graduate degree (11.3%) were obese (table 2).
- Men with a GED (24.4%) were twice as likely as men who had earned a graduate degree (12.0%) to be obese (table 2, figure 4).
- About 1 in 4 women (27.4%) who had not graduated from high school were obese compared with about 1 in 10 women (10.5%) who held a graduate degree (table 2, figure 4).
- Healthy weight status is positively associated with level of education for both men and women although the association is more striking for women (table 2).
- About one-third of men who had not graduated from high school (36.6%) were of healthy weight compared with just under one-half (45.9%) of men having the highest level of education (table 2).
- About one-third of women who had not graduated from high school (37.6%) were of healthy weight compared with nearly two-thirds





**Figure 3. Percent of adults who were overweight, by sex and race/ethnicity: United States, 1997-98**



**Figure 4. Percent of adults who were obese, by education and gender: United States, 1997-98**

(66.5%) of women with the highest level of education (table 2).

- Prevalence of underweight appeared to be unrelated to educational attainment and was less than 3% across all education groups (table 2).

### Poverty status

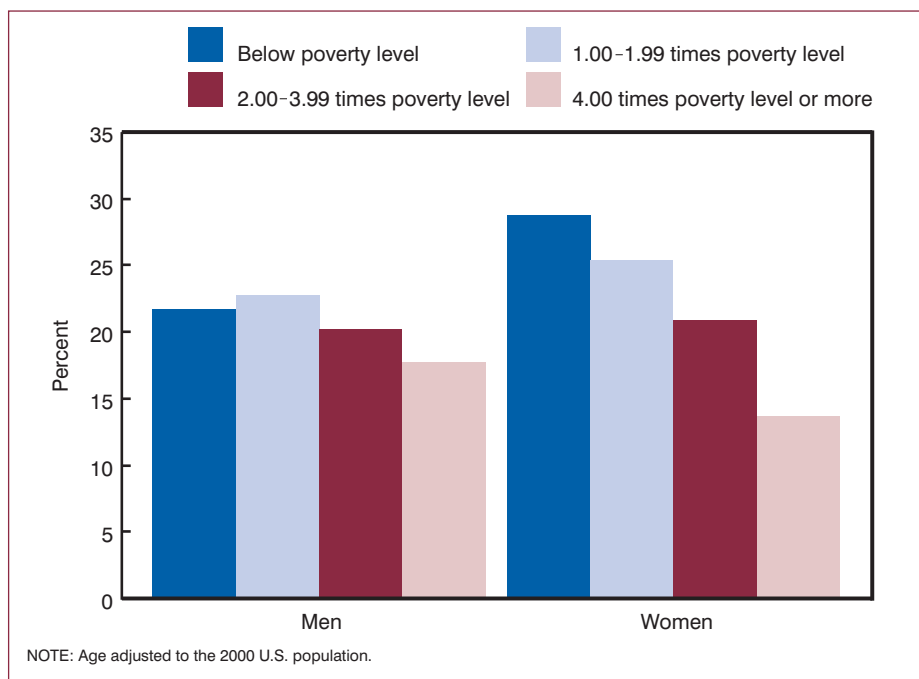
- Men with incomes below the poverty level (57.0%) were somewhat less likely than men in the highest income group (63.6%) to be overweight (table 1).
- Women below the poverty level (56.6%) were considerably more

likely than women earning the highest incomes (38.1%) to be overweight (table 1).

- About 1 in 4 adults below the poverty level (26.0%) compared with about 1 in 6 adults with incomes 4 times the poverty level or more (15.8%) were obese (table 2).
- Obesity was more strongly associated with relative income level for women than for men (table 2, figure 5).
- Men with incomes below the poverty level (21.7%) were somewhat more likely than men with the highest incomes (17.7%) to be obese (table 2, figure 5).
- Women with incomes below the poverty level (28.7%) were more than twice as likely as women with the highest incomes (13.7%) to be obese (table 2, figure 5).
- Among men, prevalence of healthy weight was highest among those living below the poverty level (table 2).
- Among women, prevalence of healthy weight was lowest among those in the two lowest income groups and markedly higher among women in the higher income groups (table 2).

### Marital status

- Married men (65.6%) were more likely than never married men (54.4%) to be overweight (table 1).
- Separated and divorced women (50.8%) were more likely than married women (46.4%) to be overweight (table 1).
- The prevalence of obesity was lowest among cohabiting adults (16.6%) compared with adults in other marital status groups (table 2).
- Married men (20.4%) were more likely than cohabiting men (17.1%) and divorced or separated men (16.8%) to be obese (table 2).
- Never married women (23.1%) and divorced or separated women (23.2%) were more likely than married women (18.4%) to be obese (table 2).
- Married men (33.5%) were less likely than cohabiting men (39.2%), divorced or separated men (40.4%), and never married men (44.5%) to be in the healthy weight range (table 2).



**Figure 5. Percent of adults who were obese, by sex and poverty status: United States, 1997-98**

- Married women (50.3%) were more likely than never married women (47.4%) and divorced or separated women (45.6%) to be in the healthy weight range (table 2).

### Geographic region

- Adults living in the West (51.6%) were less likely than their counterparts living in the Midwest (56.4%), South (55.4%), and Northeast (54.0%) to be overweight (table 1).
- Adults living in the West (17.0%) were less likely than adults living in the Midwest (20.8%), South (20.4%), and Northeast (18.9%) to be obese (table 2).

### Place of residence

- Adults living outside a metropolitan statistical area (MSA) (57.4%) were slightly more likely than adults living in an MSA, whether outside the central city (54.2%) or in the central city (53.7%), to be overweight (table 1).
- Adults living outside an MSA (21.7%) were more likely than adults living in the central city of an MSA (19.5%) or living outside the central city (18.6%) to be obese (table 2).

- Healthy weight was more prevalent among men living in the central city of an MSA (39.4%) than among men living in an MSA but not in the central city (i.e., the suburbs) (35.5%) or men living outside an MSA (34.1%).
- Healthy weight was more prevalent for women living in an MSA but not in the central city (i.e., the suburbs) (51.5%) than among women living either in the central city of an MSA (48.0%) or outside an MSA (46.7%).

## Discussion

Data shown in this report suggest that overweight and obesity represent a significant public health problem in the United States. Nearly two-thirds of men and nearly one-half of women were overweight. About 20% of adults were obese. Because these data are self-reported, it is possible and even likely that they are underestimates of the extent of overweight in this country. The National Health and Nutrition Examination Survey (NHANES), another survey conducted by CDC's NCHS, obtains physical measurements of height and weight for a representative sample of U.S. residents (1). The NHANES is the official data source for

estimates of the body weight status of the U.S. population and is used for tracking progress toward the national health promotion objectives (22-24). The NHIS findings, though acknowledged to likely be somewhat underestimates compared with findings from NHANES, offer the opportunity to better study socioeconomic differentials in body weight status among smaller population subgroups and to examine changes over time.

Interesting sociodemographic differentials were detected and were generally consistent with those found in earlier NHIS data years (25-27). Although overall prevalence of obesity was about the same for men (19.3%) and women (19.7%), just over one-third of men (36.3%) were considered of healthy weight compared with about one-half of women (49.5%). Rates of obesity were highest among adults aged 45-64 years—both men (23.8%) and women (24.7%)—compared with other age groups. Black non-Hispanic adults (29.0%), particularly black non-Hispanic women (32.9%), had the highest rates of obesity, followed by Hispanic adults (22.6%) and white non-Hispanic adults (18.2%). Asian/Pacific Islander non-Hispanic adults (6.3%) had the lowest rates of obesity of any race-ethnicity group studied.

Socioeconomic differentials in body weight status were greater among women than among men. Among women, rates of obesity were particularly high for those who had not graduated from high school (27.4%) and those who had earned a GED (26.1%). Rates declined steadily with increasing education and were markedly lower among women who had earned a bachelor's degree (12.5%) or an advanced academic degree (10.5%). Similarly among men, rates of obesity were highest among those with less education and lowest among those with college degrees, although the association was not as strong as for women.

Income level, measured as a ratio of family income to the poverty level, was associated with obesity. This association was stronger among women. Prevalence of obesity among women ranged from

28.7% for those living below poverty to 13.7% for those in the highest income group. By comparison, rates of obesity among men ranged from 21.7% for those living below poverty to 17.7% of those in the highest income category. The association between overweight (that is, a BMI of 25 or more) and poverty status differed for men and women. Whereas women with incomes below the poverty level were more likely to be overweight than women at the upper end of the income range, men having incomes below the poverty level were less likely to be overweight than men in any of the higher income levels.

Analysis of body weight status by marital status revealed only modest associations, which differed for men and women. Married men had higher rates of being overweight (65.6%) than separated and divorced men (58.7%). In contrast, married women had lower rates of being overweight (46.4%) than separated and divorced women (50.8%). Similarly, married men had higher rates of obesity (20.4%) than separated and divorced men (16.8%), and married women (18.4%) had lower rates of obesity than separated and divorced women (23.2%). Large standard errors for some of the marital status groups made it difficult to interpret findings for these groups.

Adults living in the West had the lowest prevalence of overweight generally and the lowest prevalence of obesity compared with the other regions of the country. In terms of urban-rural variations, rates of obesity were highest among adults living outside an MSA (21.7%) and lowest among adults living in an MSA but outside the central city (i.e., in the suburbs) (18.6%).

## Conclusion

Since the 1960s, overweight and obesity have increased dramatically in the United States. This report adds to the increasing body of evidence showing that overweight and obesity are widespread in this country, and that the risk of being overweight or obese varies by population subgroup. Careful attention to sociodemographic patterns in body weight status will assist in appropriately targeting programs to

encourage better nutritional management and greater participation in physical activities that would lead to maintenance of healthy body weight. The descriptive statistics and highlights presented in this report are a foundation for future studies of health behavior profiles as they relate to health and disease among various population subgroups.

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**Table 1. Percent of adults 18 years of age and over who were overweight, by selected characteristics: United States, average annual, 1997–98**

Selected characteristic	Overweight (BMI of 25 or more) <sup>1</sup>		
	Both sexes	Men	Women
	Percent of adults (standard error)		
Ages 18 years and over (age-adjusted) <sup>2,3</sup> . . . . .	54.7 (0.25)	62.7 (0.37)	46.9 (0.33)
Ages 18 years and over (crude) <sup>2</sup> . . . . .	54.6 (0.26)	62.9 (0.38)	46.8 (0.33)
Age			
18–24 years . . . . .	37.5 (0.72)	42.5 (1.06)	32.3 (0.95)
25–44 years . . . . .	53.7 (0.36)	64.3 (0.48)	43.2 (0.47)
45–64 years . . . . .	63.5 (0.43)	71.5 (0.61)	55.7 (0.61)
65–74 years . . . . .	61.1 (0.67)	67.0 (0.93)	56.2 (0.91)
75 years and over . . . . .	47.2 (0.75)	50.0 (1.31)	45.3 (0.88)
Race-ethnicity <sup>3</sup>			
Hispanic . . . . .	61.6 (0.70)	66.2 (0.95)	56.6 (0.92)
White non-Hispanic . . . . .	53.0 (0.29)	62.7 (0.41)	43.4 (0.39)
Black non-Hispanic . . . . .	65.5 (0.59)	65.7 (1.00)	65.2 (0.70)
Asian/Pacific Islander non-Hispanic . . . . .	31.6 (1.67)	36.7 (2.50)	27.1 (1.91)
Education <sup>3</sup>			
Less than high school graduate . . . . .	60.4 (0.52)	62.0 (0.75)	58.7 (0.75)
GED diploma <sup>4</sup> . . . . .	60.3 (1.34)	64.3 (1.92)	56.0 (1.93)
High school graduate . . . . .	56.8 (0.44)	64.7 (0.65)	49.7 (0.55)
Some college—no degree . . . . .	55.3 (0.54)	65.6 (0.77)	45.6 (0.69)
Associate of Arts degree . . . . .	55.3 (0.87)	66.2 (1.24)	46.3 (1.12)
Bachelor of Arts, Science degree . . . . .	47.5 (0.60)	59.0 (0.89)	35.7 (0.85)
Master's, doctorate, medical degree . . . . .	42.4 (0.99)	53.7 (1.73)	29.2 (0.96)
Poverty status <sup>3,5</sup>			
Below poverty level . . . . .	56.9 (0.66)	57.0 (1.10)	56.6 (0.83)
1.00–1.99 times poverty level . . . . .	58.7 (0.60)	62.4 (0.84)	55.4 (0.78)
2.00–3.99 times poverty level . . . . .	56.7 (0.43)	63.5 (0.65)	49.7 (0.58)
4.00 times poverty level or more . . . . .	51.7 (0.48)	63.6 (0.69)	38.1 (0.63)
Marital status <sup>3</sup>			
Never married . . . . .	51.4 (0.65)	54.4 (0.99)	48.2 (0.93)
Married . . . . .	56.0 (0.36)	65.6 (0.54)	46.4 (0.48)
Cohabiting . . . . .	53.4 (1.37)	59.8 (1.75)	46.7 (2.74)
Divorced or separated . . . . .	54.0 (0.72)	58.7 (1.20)	50.8 (0.90)
Widowed . . . . .	51.0 (1.85)	61.1 (3.30)	48.7 (2.20)
Geographic region <sup>3</sup>			
Northeast . . . . .	54.0 (0.57)	63.1 (0.80)	45.5 (0.66)
Midwest . . . . .	56.4 (0.43)	64.6 (0.65)	48.3 (0.63)
South . . . . .	55.4 (0.44)	62.7 (0.66)	48.4 (0.58)
West . . . . .	51.6 (0.60)	59.7 (0.87)	43.4 (0.69)
Place of residence <sup>3</sup>			
MSA, central city <sup>6</sup> . . . . .	53.7 (0.45)	59.6 (0.66)	48.1 (0.61)
MSA, not central city <sup>6</sup> . . . . .	54.2 (0.37)	63.6 (0.47)	45.0 (0.51)
Not MSA <sup>6</sup> . . . . .	57.4 (0.57)	64.9 (0.85)	49.9 (0.68)

<sup>1</sup>Body Mass Index (BMI) is calculated as kilograms/meters<sup>2</sup>, using self-reported height and weight. Overweight is defined as a BMI of 25 or more, which includes obese.

<sup>2</sup>Persons of other races and unknown race and ethnicity, unknown education, unknown poverty status, and unknown marital status are included in the total.

<sup>3</sup>Age adjusted to the 2000 projected U.S. population using age groups 18–24 years, 25–44 years, 45–64 years, 65–74 years, and 75 years and over.

<sup>4</sup>GED is General Educational Development high school equivalency diploma.

<sup>5</sup>Poverty status is based on family income and family size using the U.S. Census Bureau poverty thresholds for 1996 and 1997.

<sup>6</sup>MSA is metropolitan statistical area (see Technical notes).

NOTE: Denominator for each percent excludes persons with unknown body mass index.

**Table 2. Percent distribution of body weight status for adults 18 years of age and over, by selected characteristics: United States, average annual, 1997–98**

Selected characteristic	Total	Body weight status <sup>1</sup>			
		Not overweight		Overweight	
		Underweight	Healthy weight	Overweight (but not obese)	Obese
		Percent distribution (standard error)			
Both sexes					
Ages 18 years and over (age-adjusted) <sup>2,3</sup>	100.0	2.3 (0.08)	43.0 (0.25)	35.2 (0.22)	19.5 (0.19)
Ages 18 years and over (crude) <sup>2</sup>	100.0	2.3 (0.08)	43.1 (0.26)	35.1 (0.23)	19.5 (0.19)
Age:					
18–24 years	100.0	4.7 (0.35)	57.8 (0.75)	24.7 (0.60)	12.8 (0.50)
25–44 years	100.0	2.0 (0.10)	44.2 (0.35)	34.4 (0.34)	19.4 (0.27)
45–64 years	100.0	1.2 (0.09)	35.3 (0.43)	39.2 (0.41)	24.3 (0.39)
65–74 years	100.0	1.6 (0.16)	37.3 (0.65)	41.1 (0.73)	20.0 (0.56)
75 years and over	100.0	5.0 (0.35)	47.8 (0.79)	34.4 (0.69)	12.8 (0.46)
Race-ethnicity <sup>3</sup> :					
Hispanic	100.0	1.4 (0.15)	37.0 (0.68)	39.0 (0.61)	22.6 (0.52)
White non-Hispanic	100.0	2.4 (0.10)	44.6 (0.29)	34.8 (0.25)	18.2 (0.23)
Black non-Hispanic	100.0	1.4 (0.13)	33.1 (0.61)	36.6 (0.59)	29.0 (0.56)
Asian/Pacific Islander non-Hispanic	100.0	6.2 (0.76)	62.3 (1.79)	25.2 (1.44)	6.3 (0.83)
Education <sup>3</sup> :					
Less than high school graduate	100.0	2.5 (0.19)	37.1 (0.54)	35.7 (0.56)	24.7 (0.50)
GED diploma <sup>4</sup>	100.0	2.5 (0.63)	37.1 (1.36)	35.3 (1.37)	25.0 (1.15)
High school graduate	100.0	2.4 (0.14)	40.9 (0.44)	35.9 (0.43)	20.9 (0.35)
Some college—no degree	100.0	2.2 (0.14)	42.5 (0.54)	35.6 (0.51)	19.7 (0.42)
Associate of Arts degree	100.0	1.9 (0.22)	42.8 (0.88)	35.8 (0.78)	19.5 (0.69)
Bachelor of Arts, Science degree	100.0	2.5 (0.23)	50.0 (0.60)	33.9 (0.57)	13.6 (0.41)
Master's, doctorate, medical degree	100.0	2.5 (0.53)	55.2 (1.08)	31.0 (0.95)	11.3 (0.48)
Poverty status <sup>3,5</sup> :					
Below poverty level	100.0	3.2 (0.23)	39.9 (0.66)	30.9 (0.67)	26.0 (0.59)
1.00–1.99 times poverty level	100.0	2.2 (0.18)	39.0 (0.59)	34.5 (0.58)	24.2 (0.51)
2.00–3.99 times poverty level	100.0	2.3 (0.14)	41.0 (0.44)	36.1 (0.41)	20.6 (0.37)
4.00 times poverty level or more	100.0	2.0 (0.16)	46.3 (0.49)	35.9 (0.45)	15.8 (0.34)
Marital status <sup>3</sup> :					
Never married	100.0	2.8 (0.22)	45.9 (0.67)	31.2 (0.61)	20.2 (0.55)
Married	100.0	2.1 (0.12)	41.9 (0.37)	36.7 (0.33)	19.3 (0.27)
Cohabiting	100.0	1.9 (0.31)	44.7 (1.37)	36.8 (1.35)	16.6 (0.95)
Divorced or separated	100.0	2.5 (0.26)	43.4 (0.73)	33.4 (0.68)	20.6 (0.54)
Widowed	100.0	*3.4 (1.34)	45.6 (2.12)	29.0 (1.68)	22.0 (1.46)
Geographic region <sup>3</sup> :					
Northeast	100.0	2.1 (0.17)	43.9 (0.58)	35.1 (0.42)	18.9 (0.49)
Midwest	100.0	2.2 (0.14)	41.4 (0.43)	35.7 (0.42)	20.8 (0.39)
South	100.0	2.6 (0.14)	42.0 (0.44)	35.1 (0.40)	20.4 (0.34)
West	100.0	2.4 (0.18)	46.1 (0.62)	34.6 (0.47)	17.0 (0.33)
Place of residence <sup>3</sup> :					
MSA, central city <sup>6</sup>	100.0	2.6 (0.12)	43.8 (0.46)	34.1 (0.37)	19.5 (0.34)
MSA, not central city <sup>6</sup>	100.0	2.2 (0.11)	43.6 (0.36)	35.6 (0.29)	18.6 (0.29)
Not MSA <sup>6</sup>	100.0	2.2 (0.16)	40.4 (0.55)	35.7 (0.51)	21.7 (0.41)

See footnotes at end of table.

**Table 2. Percent distribution of body weight status for adults 18 years of age and over, by selected characteristics: United States, average annual, 1997–98—Con.**

Selected characteristic	Total	Body weight status <sup>1</sup>			
		Not overweight		Overweight	
		Underweight	Healthy weight	Overweight (but not obese)	Obese
		Percent distribution (standard error)			
Men					
Ages 18 years and over (age-adjusted) <sup>2,3</sup>	100.0	0.9 (0.07)	36.3 (0.37)	43.4 (0.35)	19.3 (0.29)
Ages 18 years and over (crude) <sup>2</sup>	100.0	0.9 (0.07)	36.2 (0.37)	43.4 (0.35)	19.4 (0.29)
Age:					
18–24 years	100.0	2.2 (0.33)	55.2 (1.09)	29.8 (0.91)	12.7 (0.74)
25–44 years	100.0	0.6 (0.07)	35.1 (0.48)	44.3 (0.49)	20.0 (0.40)
45–64 years	100.0	0.6 (0.10)	27.9 (0.61)	47.7 (0.65)	23.8 (0.56)
65–74 years	100.0	0.7 (0.16)	32.3 (0.92)	48.0 (1.02)	18.9 (0.84)
75 years and over	100.0	2.3 (0.39)	47.7 (1.30)	40.0 (1.22)	10.0 (0.70)
Race-ethnicity <sup>3</sup> :					
Hispanic	100.0	1.0 (0.23)	32.7 (0.96)	44.4 (0.88)	21.8 (0.79)
White non-Hispanic	100.0	0.9 (0.08)	36.4 (0.41)	44.0 (0.40)	18.7 (0.34)
Black non-Hispanic	100.0	0.7 (0.14)	33.6 (1.00)	41.7 (0.99)	24.0 (0.88)
Asian/Pacific Islander non-Hispanic	100.0	*2.3 (0.78)	61.0 (2.58)	29.7 (2.02)	7.1 (1.22)
Education <sup>3</sup> :					
Less than high school graduate	100.0	1.4 (0.17)	36.6 (0.75)	40.2 (0.79)	21.8 (0.67)
GED diploma <sup>4</sup>	100.0	*2.0 (0.80)	33.8 (1.89)	39.9 (2.05)	24.4 (1.71)
High school graduate	100.0	1.1 (0.15)	34.2 (0.64)	43.9 (0.70)	20.9 (0.55)
Some college—no degree	100.0	0.6 (0.11)	33.8 (0.76)	45.0 (0.77)	20.6 (0.65)
Associate of Arts degree	100.0	*0.5 (0.16)	33.3 (1.24)	46.0 (1.25)	20.1 (0.97)
Bachelor of Arts, Science degree	100.0	1.0 (0.24)	39.9 (0.90)	44.3 (0.94)	14.8 (0.68)
Master's, doctorate, medical degree	100.0	*0.4 (0.15)	45.9 (1.74)	41.7 (1.75)	12.0 (0.69)
Poverty status <sup>3,5</sup> :					
Below poverty level	100.0	1.9 (0.30)	41.1 (1.11)	35.3 (1.04)	21.7 (1.04)
1.00–1.99 times poverty level	100.0	1.2 (0.20)	36.4 (0.83)	39.6 (0.90)	22.8 (0.75)
2.00–3.99 times poverty level	100.0	1.0 (0.15)	35.4 (0.65)	43.3 (0.66)	20.2 (0.51)
4.00 times poverty level or more	100.0	0.5 (0.11)	35.9 (0.70)	45.9 (0.63)	17.7 (0.48)
Marital status <sup>3</sup> :					
Never married	100.0	1.1 (0.19)	44.5 (0.99)	36.7 (0.91)	17.6 (0.77)
Married	100.0	0.9 (0.13)	33.5 (0.54)	45.3 (0.55)	20.4 (0.43)
Cohabiting	100.0	*1.0 (0.38)	39.2 (1.76)	42.7 (1.82)	17.1 (1.34)
Divorced or separated	100.0	0.9 (0.22)	40.4 (1.20)	41.9 (1.21)	16.8 (0.75)
Widowed	100.0	*0.8 (0.33)	38.1 (3.30)	41.6 (3.93)	19.5 (3.86)
Geographic region <sup>3</sup> :					
Northeast	100.0	0.8 (0.13)	36.1 (0.80)	44.0 (0.75)	19.1 (0.74)
Midwest	100.0	0.8 (0.12)	34.6 (0.65)	44.7 (0.73)	19.9 (0.61)
South	100.0	1.2 (0.14)	36.1 (0.66)	42.7 (0.58)	20.1 (0.47)
West	100.0	0.9 (0.15)	39.4 (0.87)	42.5 (0.75)	17.2 (0.53)
Place of residence <sup>3</sup> :					
MSA, central city <sup>6</sup>	100.0	1.0 (0.12)	39.4 (0.67)	41.3 (0.63)	18.3 (0.48)
MSA, not central city <sup>6</sup>	100.0	0.9 (0.10)	35.5 (0.48)	44.5 (0.43)	19.1 (0.43)
Not MSA <sup>6</sup>	100.0	1.0 (0.16)	34.1 (0.83)	43.8 (0.80)	21.1 (0.56)

See footnotes at end of table.

**Table 2. Percent distribution of body weight status for adults 18 years of age and over, by selected characteristics: United States, average annual, 1997–98—Con.**

Selected characteristic	Total	Body weight status <sup>1</sup>			
		Not overweight		Overweight	
		Underweight	Healthy weight	Overweight (but not obese)	Obese
Women		Percent distribution (standard error)			
Ages 18 years and over (age-adjusted) <sup>2,3</sup>	100.0	3.6 (0.13)	49.5 (0.33)	27.2 (0.27)	19.7 (0.26)
Ages 18 years and over (crude) <sup>2</sup>	100.0	3.7 (0.13)	49.5 (0.33)	27.2 (0.28)	19.6 (0.25)
Age:					
18–24 years	100.0	7.2 (0.60)	60.4 (1.01)	19.5 (0.78)	12.9 (0.63)
25–44 years	100.0	3.5 (0.18)	53.3 (0.45)	24.5 (0.40)	18.8 (0.36)
45–64 years	100.0	1.8 (0.16)	42.5 (0.62)	30.9 (0.53)	24.7 (0.54)
65–74 years	100.0	2.4 (0.27)	41.4 (0.91)	35.3 (0.94)	20.9 (0.72)
75 years and over	100.0	6.7 (0.50)	47.9 (0.92)	30.7 (0.84)	14.7 (0.63)
Race-ethnicity <sup>3</sup> :					
Hispanic	100.0	1.9 (0.18)	41.5 (0.89)	33.4 (0.86)	23.3 (0.69)
White non-Hispanic	100.0	3.8 (0.16)	52.8 (0.40)	25.8 (0.31)	17.6 (0.30)
Black non-Hispanic	100.0	2.0 (0.22)	32.8 (0.70)	32.3 (0.76)	32.9 (0.71)
Asian/Pacific Islander non-Hispanic	100.0	9.9 (1.20)	63.0 (1.89)	21.2 (1.61)	5.8 (1.19)
Education <sup>3</sup> :					
Less than high school graduate	100.0	3.6 (0.32)	37.6 (0.78)	31.3 (0.71)	27.4 (0.70)
GED diploma <sup>4</sup>	100.0	3.0 (0.78)	41.0 (1.96)	30.0 (1.85)	26.1 (1.68)
High school graduate	100.0	3.5 (0.23)	46.8 (0.56)	28.9 (0.53)	20.8 (0.46)
Some college—no degree	100.0	3.7 (0.26)	50.7 (0.72)	26.7 (0.60)	18.9 (0.55)
Associate of Arts degree	100.0	3.0 (0.39)	50.6 (1.12)	27.4 (0.93)	19.0 (0.83)
Bachelor of Arts, Science degree	100.0	3.9 (0.37)	60.4 (0.86)	23.2 (0.73)	12.5 (0.52)
Master's, doctorate, medical degree	100.0	4.4 (0.88)	66.5 (1.24)	18.6 (0.88)	10.5 (0.67)
Poverty status <sup>3,5</sup> :					
Below poverty level	100.0	4.1 (0.33)	39.3 (0.84)	27.9 (0.80)	28.7 (0.76)
1.00–1.99 times poverty level	100.0	3.2 (0.28)	41.4 (0.76)	30.0 (0.76)	25.4 (0.68)
2.00–3.99 times poverty level	100.0	3.6 (0.24)	46.7 (0.59)	28.8 (0.57)	20.9 (0.49)
4.00 times poverty level or more	100.0	3.7 (0.31)	58.2 (0.67)	24.4 (0.56)	13.7 (0.47)
Marital status <sup>3</sup> :					
Never married	100.0	4.4 (0.37)	47.4 (0.94)	25.0 (0.84)	23.1 (0.79)
Married	100.0	3.4 (0.20)	50.3 (0.48)	28.0 (0.40)	18.4 (0.36)
Cohabiting	100.0	2.6 (0.43)	50.7 (2.73)	30.3 (2.67)	16.4 (1.35)
Divorced or separated	100.0	3.6 (0.39)	45.6 (0.92)	27.6 (0.80)	23.2 (0.72)
Widowed	100.0	*5.6 (2.64)	45.7 (2.99)	25.9 (1.84)	22.8 (1.61)
Geographic region <sup>3</sup> :					
Northeast	100.0	3.3 (0.31)	51.2 (0.68)	26.9 (0.60)	18.6 (0.58)
Midwest	100.0	3.4 (0.25)	48.3 (0.62)	26.8 (0.55)	21.5 (0.51)
South	100.0	3.9 (0.22)	47.8 (0.58)	27.8 (0.48)	20.5 (0.45)
West	100.0	3.8 (0.31)	52.7 (0.75)	26.8 (0.55)	16.6 (0.46)
Place of residence <sup>3</sup> :					
MSA, central city <sup>6</sup>	100.0	4.0 (0.21)	48.0 (0.63)	27.5 (0.53)	20.6 (0.44)
MSA, not central city <sup>6</sup>	100.0	3.5 (0.19)	51.5 (0.49)	26.9 (0.40)	18.1 (0.38)
Not MSA <sup>6</sup>	100.0	3.4 (0.29)	46.7 (0.66)	27.7 (0.54)	22.2 (0.55)

\* Figure does not meet standards of reliability or precision (see Technical notes).

<sup>1</sup>Body weight status was based on Body Mass Index (BMI) using self-reported height and weight. The formula for BMI is kilograms/meters<sup>2</sup>. Underweight is defined as a BMI of less than 18.5; healthy weight is defined as a BMI of at least 18.5 and less than 25; overweight, and not obese, is defined as a BMI of at least 25 and less than 30; and obese is defined as a BMI of 30 or more.

<sup>2</sup>Persons of other races and unknown race and ethnicity, unknown education, unknown poverty status, and unknown marital status are included in the total.

<sup>3</sup>Age adjusted to the 2000 projected U.S. population using age groups 18–24 years, 25–44 years, 45–64 years, 65–74 years, and 75 years and over.

<sup>4</sup>GED is General Educational Development high school equivalency diploma.

<sup>5</sup>Poverty status is based on family income and family size using the U.S. Census Bureau poverty thresholds for 1996 and 1997.

<sup>6</sup>MSA is metropolitan statistical area (see Technical notes).

NOTE: Denominator for each percent distribution excludes persons with unknown body mass index.



## Technical Notes

### Sample design

The National Health Interview Survey (NHIS) is a cross-sectional household interview survey of the U.S. civilian noninstitutionalized population. Data are collected continuously throughout the year in all 50 States and the District of Columbia. The NHIS uses a multi-stage, clustered sample design to produce national estimates for a variety of health indicators. Information on basic health topics is collected for all household members, by proxy from one family member if necessary. Additional information is collected for one randomly sampled adult and one randomly sampled child in each family. Self-response is required for the Sample Adult questionnaire except in the case of sample adults who are physically or mentally incapable of responding for themselves. Interviews are conducted in the home using a computer-assisted personal interview (CAPI) questionnaire with telephone permitted for followup, if necessary.

### Response rates

In 1997, interviews were completed in 39,832 households and 40,623 families, with 36,116 adults completing the Sample Adult portion of the interview. The final response rate for the 1997 Sample Adult questionnaire was 80.4% (12). In 1998, interviews were completed in 38,209 households and 38,773 families, with 32,440 adults completing the Sample Adult component. The final response rate for the 1998 Sample Adult questionnaire was 73.9% (13). Combining years 1997 and 1998, NHIS interviews were completed in 78,041 households, with 79,396 interviewed families and 68,556 interviewed sample adults aged 18 years and over. The final response rate for the 1997–98 combined sample adult files was 77.2%. Procedures used in calculating response rates are described in detail in appendix I of the Survey Description of the NHIS data files (12,13).

### Item nonresponse

Item nonresponse for each of the sociodemographic indicators was less than 1%, with the exception of questions related to income. Item nonresponse for detailed income was about 19.5%. Persons with unknown sociodemographic characteristics are not shown separately in the tables, but are included in the totals and in all other variables for which data were reported. Item nonresponse was about 1% for the height question and about 3% for the question on weight. A total of 3.1% of respondents were missing at least one of these items. BMI could not be calculated for persons who were missing either height or weight. The denominators for percents shown in tables 1 and 2 exclude persons with unknown BMI.

### Age adjustment

Data shown in tables 1 and 2 and figures 1–5 were age adjusted using the projected year 2000 population provided by the U.S. Bureau of the Census (19, 20). Age adjustment was used to allow comparison among various population subgroups that have different age structures. This is particularly important for demographic characteristics such as race and ethnicity, education, and marital status. It is also helpful for other characteristics. The following age groups were used for age adjustment: 18–24 years, 25–44 years, 45–64 years, 65–74 years, and 75 years and over (table 1).

**Table 1. Age distribution and age-adjustment weights used in age-adjusting data shown in tables 1–2, and figures 1, 3–5**

Age	Standard population in thousands
18 years and over . . . . .	203,851
18–24 years . . . . .	26,258
25–44 years . . . . .	81,892
45–64 years . . . . .	60,991
65–74 years . . . . .	18,136
75 years and over . . . . .	16,574

Estimates were calculated using software for statistical analysis of correlated data (SUDAAN) (18). The SUDAAN procedure PROC DESCRIPT was used to produce age-adjusted percents and their standard errors.

### Tests of significance

Statistical tests performed to assess significance of differences in the estimates were two-tailed with no adjustments for multiple comparisons. The test statistic used to determine statistical significance of differences between two percents was:

$$t = \frac{|X_a - X_b|}{\sqrt{S_a^2 + S_b^2}}$$

where  $X_a$  and  $X_b$  are the two percents being compared, and  $S_a$  and  $S_b$  are the standard errors of the percents. The critical value used for two-sided tests at the 0.05 level of significance was 1.96.

### Relative standard error

The relative standard error RSE ( $x$ ) of an estimate  $x$  is obtained by dividing the standard error SE ( $x$ ) of the estimate by the estimate itself. This quantity is expressed as a percent of the estimate:

$$RSE(x) = 100 \left( \frac{SE(x)}{x} \right)$$

In tables 1 and 2, estimates having an RSE of more than 30% are indicated with an asterisk and are considered statistically unreliable.

### Definition of terms

#### Demographic terms

**Age**—Age at last birthday is initially asked of the household respondent for all family members and subsequently verified with the sample adult respondent.

**Race-ethnicity**—The questions related to race and ethnicity initially were asked of the household respondent and subsequently verified with the sample adult. A flash card showing the response categories was shown to the respondent. For this analysis, persons reporting any Hispanic ethnicity were classified as “Hispanic” regardless of

racial identification. Respondents were asked to report as many racial identifications as they thought applicable, with a followup question asking which race best described them. The “best race” question was used in this report to classify persons according to a limited set of race groups. The categories “white non-Hispanic” and “black non-Hispanic” are single race categories. The category “Asian/Pacific Islander non-Hispanic” includes Chinese, Filipino, Hawaiian, Vietnamese, Japanese, Korean, Samoan, Guamanian, Asian Indian, and any other Asian/Pacific Islander group. Several race-ethnic groups identified in the NHIS were not shown separately in this report due to small sample sizes and large standard errors associated with most statistics for these groups. These include American Indian, Aleut, Eskimo, multiple races with no main race specified, and other unspecified races. These groups are included in the totals in each table.

**Education**—This question was asked of the household respondent and not verified with the sample adult. The question asks for the highest level of school attended or highest degree received. Respondents were shown a flash card to choose an appropriate category. Greater detail is available on the data file; categories were combined in this report due to small sample sizes in some groups.

**Poverty status**—Poverty status is based on family income and family size using the U.S. Census Bureau’s poverty thresholds (28,29). Each adult’s poverty status is expressed in terms of a ratio of family income to the appropriate poverty threshold. The lowest income group consists of persons living below the poverty level (ratio less than 1.00). The highest income group consists of persons whose family incomes were at least 4 times the poverty level (ratio of 4.00 or more).

**Marital status**—Respondents were asked to choose a marital status category and beginning in 1997, one of the choices was “living with partner,” which is also termed “cohabiting.” Adults could select the category they felt most appropriate for their marital situation. The major differences in the

new NHIS design is that persons who were “living with partner” were considered members of the same family, whereas in the pre-1997 NHIS, they were considered separate families.

**Geographic region**—The U.S. population is classified by geographic area into four regions. These regions, which correspond to those used by the U.S. Census Bureau, are as follows:

Region	States included
Northeast	Maine, Vermont, New Hampshire, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, and Pennsylvania
Midwest	Ohio, Illinois, Indiana, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Kansas, and Nebraska
South	Delaware, Maryland, District of Columbia, West Virginia, Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Oklahoma, Arkansas, and Texas
West	Washington, Oregon, California, Nevada, New Mexico, Arizona, Idaho, Utah, Colorado, Montana, Wyoming, Alaska, and Hawaii

**MSA**—MSA or metropolitan statistical area, a term first used in 1983, was defined by the U.S. Office of Management and Budget and is used by the U.S. Bureau of the Census to classify geographic areas (30). The categories shown in this report are (a) “MSA, central city,” which generally refers to cities with populations of 50,000 or more; (b) “MSA, not central city,” which refers to communities adjacent to the central city of an MSA that have a high degree of economic and social integration with the central city; and (c) “Not MSA,” which refers to rural areas of the country. The classification of areas in the 1997–98 NHIS is based on data from the 1990 decennial census.

## Body weight terms

**Body mass index**—Body mass index is calculated from self-reported height and weight. Height reported in U.S. customary units (feet and inches) was first converted to height in inches and then from inches to meters (1 meter = 39.37 inches). Weight reported in U.S. customary units (pounds) was converted from pounds to kilograms (1 kilogram = 2.205 pounds). Thus,

Body Mass Index  
(BMI) =  $\text{kg}/(\text{m}^2)$ , where:

$\text{kg}$  (kilograms) =  $\text{weight}$   
in pounds/2.205,

and  $\text{m}$  (meters) =  $\text{height}$   
in inches/39.37.

**Body weight status**—Body weight status refers to the entire spectrum of body weight, including underweight, healthy weight, overweight but not obese, and obese. It is based on a body mass index calculated from self-reported height and weight, without shoes.

**Not overweight**—This category includes persons with a body mass index of less than 25 and includes both healthy weight and underweight.

**Underweight**—Persons with a body mass index of less than 18.5 were classified as underweight.

**Healthy weight**—Persons with a body mass index of at least 18.5 and less than 25 were classified as in the healthy weight range.

**Overweight**—Persons with a body mass index of 25 or more were classified as overweight. This category includes the following two subgroups:

**Overweight (but not obese)**—Persons with a body mass index of at least 25 and less than 30 were classified as overweight, but not obese.

**Obese**—Persons with a body mass index of 30 or more were classified as obese.

## Height and weight questions

The 1997 and 1998 National Health Interview Survey Sample Adult questionnaires contained two questions

(see below) concerning height and weight, which were used to produce the Body Mass Index (BMI). Each question was preceded by its question number, beginning with AHB. AHB is the acronym for the Adult Health Behavior section of the Sample Adult questionnaire. The questions appear at the end of the health behavior section (AHB) of the Sample Adult component of the survey. These two questions follow questions on smoking, physical activity, and alcohol use in the past year. The complete NHIS Sample Adult questionnaire as well as information about other components of the NHIS are available at: <http://www.cdc.gov/nchs/nhis.htm>.

AHB.190 About how tall are you without shoes?

AHB.200 About how much do you weigh without shoes?

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**Suggested citation**

Schoenborn CA, Adams PF, Barnes PM. Body weight status of adults: United States, 1997–98. Advance data from vital and health statistics; no. 330. Hyattsville, Maryland: National Center for Health Statistics. 2002.

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DHHS Publication No. (PHS) 2002-1250  
02-0551 (8/02)