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**U.S.  
Surgeon  
General's  
Call to  
Action to  
Prevent  
and  
Decrease**

# **OVERWEIGHT + OBESITY**

# five principles

Overweight and obesity have reached nationwide epidemic proportions. Both the prevention and treatment of overweight and obesity and their associated health problems are important public health goals. To achieve these goals, *The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity* is committed to five overarching principles:

- Promote the recognition of overweight and obesity as major public health problems.
- Assist Americans in balancing healthful eating with regular physical activity to achieve and maintain a healthy or healthier body weight.
- Identify effective and culturally appropriate interventions to prevent and treat overweight and obesity.
- Encourage environmental changes that help prevent overweight and obesity.
- Develop and enhance public-private partnerships to help implement this vision.

## SECTION 1:

### Overweight and Obesity as Public Health Problems in America

This *Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity* seeks to engage leaders from diverse groups in addressing a public health issue that is among the most burdensome faced by the Nation: the health consequences of overweight and obesity. This burden manifests itself in premature death and disability, in health care costs, in lost productivity and in social stigmatization. The burden is not trivial. Studies show that the risk of death rises with increasing weight. Even moderate weight excess (10 to 20 pounds for a person of average height) increases the risk of death, particularly among adults aged 30 to 64 years.<sup>1</sup>

Overweight and obesity are caused by many factors. For each individual, body weight is determined by a combination of genetic, metabolic, behavioral, environmental, cultural and socioeconomic influences. Behavioral and environmental factors are large contributors to overweight and obesity and provide the greatest opportunity for actions and interventions designed for prevention and treatment.

For the vast majority of individuals, overweight and obesity result from excess calorie consumption and/or inadequate physical activity. Unhealthy dietary habits and sedentary behavior together account for approximately 300,000 deaths every year.<sup>2,3</sup> Thus, a healthy diet and regular physical activity, consistent with the *Dietary Guidelines for Americans*, should be promoted as the cornerstone of any prevention or treatment effort.<sup>4,5</sup> According to the U.S. Department of Agriculture's 1994-1996 Continuing Survey of Food Intakes by Individuals, very few Americans meet the majority of the Food Guide Pyramid recommendations. Only 3 percent of all individuals meet four of the five recommendations for the intake of grains, fruits, vegetables, dairy products and meats.<sup>6</sup> Much work needs to be done to ensure the nutrient adequacy of our diets while at the same time avoiding excess calories. Dietary adequacy and moderation in energy consumption are both important for maintaining or achieving a healthy weight and for overall health.

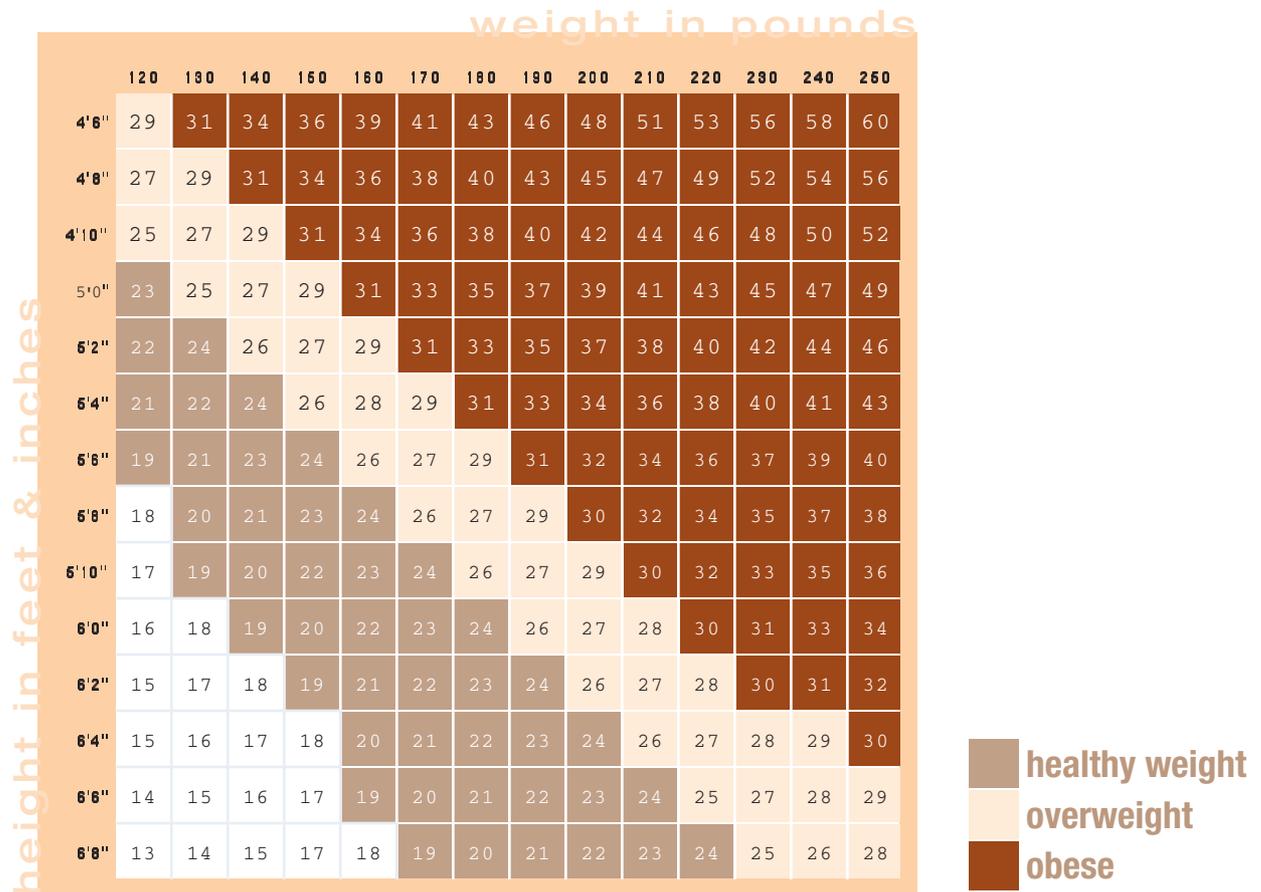
### Public Health and the Surgeon General

Through cooperative action, public health programs have successfully prevented the spread of infectious disease, protected against environmental hazards, reduced accidents and injuries, responded to disasters, worked toward ensuring the quality and accessibility of health services and promoted healthy behaviors.<sup>7</sup> Over the past 100 years, thanks largely to public health efforts, the life expectancy of Americans has increased by approximately 50 percent.<sup>10</sup>

Public health success has traditionally come from the reduction in the incidence of infectious diseases through improved sanitation and nutrition, cleaner air and water, and national vaccination programs. As the threats to America's health have shifted, so too have public health efforts. In recent years, public health efforts have successfully navigated new frontiers such as violence prevention, tobacco cessation and mental health. Public health officials remain poised to address new health challenges through the collaborative processes of scientific research, policy development and community mobilization.

$$\text{BMI} = \left\{ \frac{\text{WEIGHT (POUNDS)}}{\text{HEIGHT (INCHES)}^2} \right\} \times 703$$

**FIGURE 1: Adult Body Mass Index**



Many adult Americans have not been meeting Federal physical activity recommendations to accumulate at least 30 minutes of moderate physical activity most days of the week.<sup>47</sup> In 1997, less than one-third of adults engaged in the recommended amount of physical activity, and 40 percent of adults engaged in no leisure-time physical activity.<sup>7</sup> Although nearly 65 percent of adolescents reported participating in vigorous activity for 20 minutes or more on 3 or more out of 7 days, national data are not available to assess whether children and adolescents meet the Federal recommendations to accumulate at least 60 minutes of moderate physical activity most days of the week.<sup>48</sup> Many experts also believe that physical *inactivity* is an important part of the energy imbalance responsible for the increasing prevalence of overweight and obesity. Our society has become very sedentary; for example, in 1999, 43 percent of students in grades 9 through 12 viewed television more than 2 hours per day.<sup>8</sup>

Both dietary intake and physical activity are difficult to measure on either an individual or a population level. More research is clearly necessary to fully understand the specific etiology of this crisis. However, these statistics and the increasing prevalence of overweight and obesity highlight the need to engage all Americans as we move forward to ensure the quality and accessibility of prevention and treatment programs.

## Measuring Overweight and Obesity

The first challenge in addressing overweight and obesity lies in adopting a common public health measure of these conditions. An expert panel, convened by the National Institutes of Health (NIH) in 1998, has utilized body mass index (BMI) for defining overweight and obesity.<sup>11</sup> BMI is a practical measure that requires only two things: accurate measures of an individual's weight and height (see Figure 1). BMI is a measure of weight in relation to height. BMI is calculated as weight in pounds divided by the square of the height in inches, multiplied by 703. Alternatively, BMI can be calculated as weight in kilograms divided by the square of the height in meters.

Studies have shown that BMI is significantly correlated with total body fat content for the majority of individuals.<sup>11</sup> BMI has some limitations, in that it can overestimate body fat in persons who are very muscular, and it can underestimate body fat in persons who have lost muscle mass, such as many elderly. Many organizations, including over 50 scientific and medical organizations that have endorsed the NIH *Clinical Guidelines*, support the use of a BMI of 30 kg/m<sup>2</sup> or greater to identify obesity in adults and a BMI between 25 kg/m<sup>2</sup> and 29.9 kg/m<sup>2</sup> to identify overweight



## TABLE 1: Health Risks Associated With Obesity

Obesity is associated with an increased risk of

- premature death
- type 2 diabetes
- heart disease
- stroke
- hypertension
- gallbladder disease
- osteoarthritis  
(degeneration of cartilage and bone in joints)
- sleep apnea
- asthma
- breathing problems
- cancer (endometrial, colon, kidney, gallbladder and postmenopausal breast cancer)
- high blood cholesterol
- complications of pregnancy
- menstrual irregularities
- hirsutism (presence of excess body and facial hair)
- stress incontinence  
(urine leakage caused by weak pelvic-floor muscles)
- complications of surgery
- psychological disorders such as depression
- psychological difficulties due to social stigmatization

stigmatization, discrimination and poor body image.<sup>24</sup>

Although obesity-associated morbidities occur most frequently in adults, important consequences of excess weight, as well as antecedents of adult disease, occur in overweight children and adolescents. Overweight children and adolescents are more likely to become overweight or obese adults; this concern is greatest among adolescents. Type 2 diabetes, high blood lipids and hypertension, as well as early maturation and orthopedic problems, also occur with increased frequency in overweight youth. A common consequence of childhood overweight is psychosocial—specifically, discrimination.<sup>25</sup>

These data on the morbidity and mortality associated with overweight and obesity demonstrate the importance of the prevention of weight gain, as well as the role of obesity treatment, in maintaining and improving health and quality of life.

## Economic Consequences

Overweight and obesity and their associated health problems have substantial economic consequences for the U.S. health care system. The increasing prevalence of overweight and obesity is asso-

ciated with both direct and indirect costs. Direct health care costs refer to preventive, diagnostic and treatment services related to overweight and obesity (for example, physician visits and hospital and nursing home care). Indirect costs refer to the value of wages lost by people unable to work because of illness or disability, as well as the value of future earnings lost by premature death.<sup>27</sup>

In 1995, the total (direct and indirect) costs attributable to obesity amounted to an estimated \$99 billion.<sup>27</sup> In 2000, the total cost of obesity was estimated to be \$117 billion (\$61 billion direct and \$56 billion indirect).<sup>28</sup> Most of the cost associated with obesity is due to type 2 diabetes, coronary heart disease and hypertension.<sup>29</sup>

## Epidemiology

The United States is experiencing substantial increases in overweight and obesity (as defined by a BMI  $\geq 25$  for adults) that cut across all ages, racial and ethnic groups, and both genders.<sup>30</sup> According to self-reported measures of height and weight, obesity (BMI  $\geq 30$ ) has been increasing in every State in the Nation.<sup>31</sup> Based on clinical height and weight measurements in the 1999 National Health and Nutrition Examination Survey (NHANES), 34 percent of U.S. adults aged 20 to 74 years are overweight (BMI 25 to 29.9), and an additional 27 percent are obese (BMI = 30).<sup>32</sup> This contrasts with the late 1970s, when an estimated 32 percent of adults aged 20 to 74 years were overweight and 15 percent were obese (see Figure 3).<sup>30</sup>

The most recent data (1999) estimate that 13 percent of children aged 6 to 11 years and 14 percent of adolescents aged 12 to 19 years are overweight.<sup>33</sup> During the past two decades, the percentage of children who are overweight has nearly doubled (from 7 to 13 percent), and the percentage of adolescents who are overweight has almost tripled (from 5 to 14 percent) (see Figure 4).<sup>33</sup>

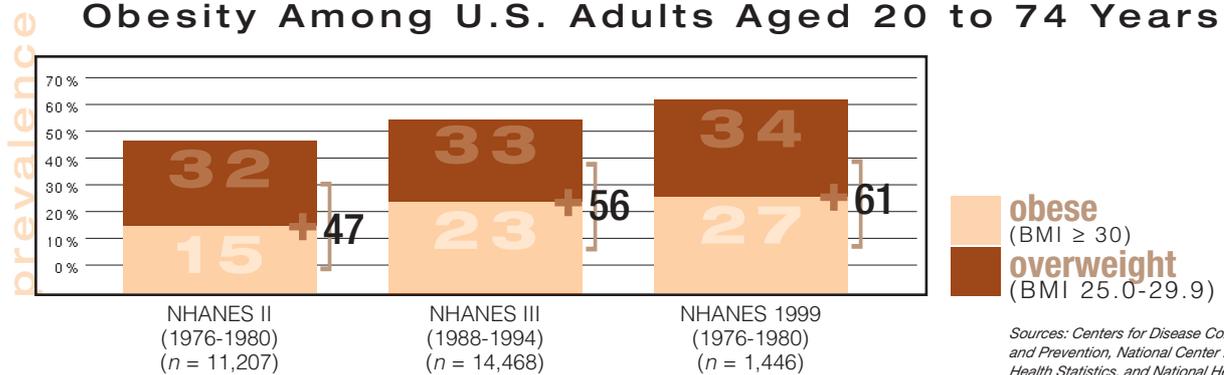
## Disparities in Prevalence

Between the second and third National Health and Nutrition Examination Surveys (NHANES II and III), the prevalence of overweight and obesity (BMI  $\geq 25$  for adults and  $\geq$  the 95th percentile for age and gender in children) increased in both genders, across all races and ethnicities, and across all age groups.<sup>15,30</sup> Disparities in overweight and obesity prevalence exist in many segments of the population based on race and ethnicity, gender, age and socioeconomic status. For example, overweight and obesity are particularly common among minority groups and those with a lower family income.

## RACE AND ETHNICITY, GENDER AND AGE

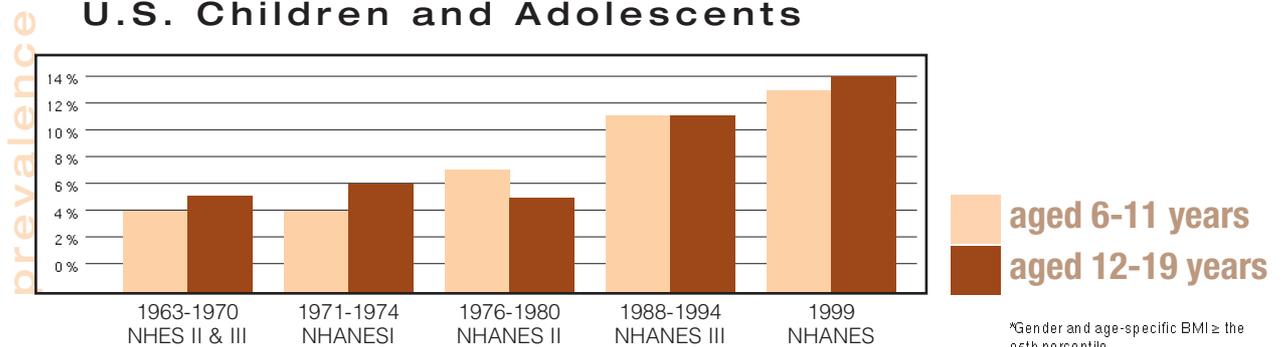
In general, the prevalence of overweight and obesity is higher in women who are members of racial and ethnic minority popula-

**FIGURE 3: Age-Adjusted Prevalence of Overweight and Obesity Among U.S. Adults Aged 20 to 74 Years**



Sources: Centers for Disease Control and Prevention, National Center for Health Statistics, and National Health and Nutrition Examination Survey.

**FIGURE 4: Prevalence of Overweight\* Among U.S. Children and Adolescents**



\*Gender and age-specific BMI ≥ the 95th percentile.

Sources: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Examination Survey, and National Health and Nutrition Examination Survey.

tions than in non-Hispanic white women. Among men, Mexican Americans have a higher prevalence of overweight and obesity than non-Hispanic whites or non-Hispanic blacks. For non-Hispanic men, the prevalence of overweight and obesity among whites is slightly greater than among blacks.<sup>30</sup>

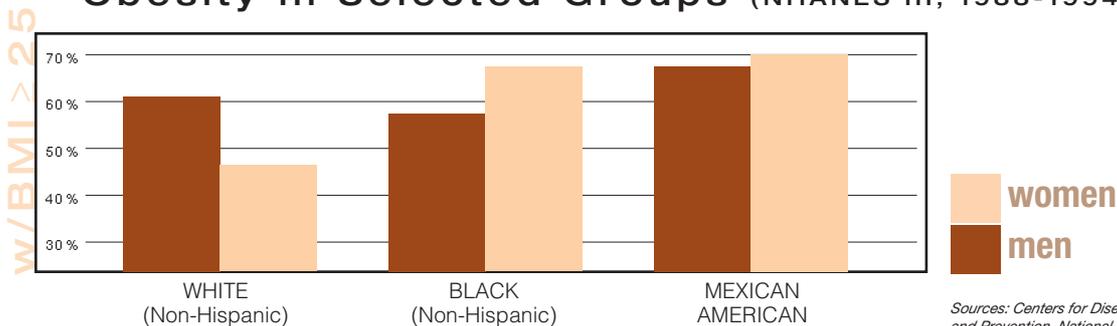
Within racial groups, gender disparities exist, although not always in the same direction. Based on NHANES III (1988-1994),<sup>30</sup> the proportion of non-Hispanic black women who were overweight or obese (BMI ≥ 25; 69 percent) was higher than the proportion of non-Hispanic black men (58 percent) (see Figure 5). For non-Hispanic whites, on the other hand, the proportion of men who were overweight or obese (BMI ≥ 25; 62 percent) exceeded the proportion of women (47 percent). However, when looking at obesity alone (BMI ≥ 30), the prevalence was slightly higher in non-Hispanic white women compared to non-Hispanic white men (23 percent and 21 percent, respectively).<sup>30</sup> The prevalence of overweight or obesity (BMI ≥ 25) was about the same in Mexican-American men and women (69 percent and 70 percent, respectively).<sup>30</sup> Although smaller surveys indicate a higher prevalence of overweight and obesity in American Indians, Alaska Natives and Pacific Islander Americans and a lower prevalence in Asian Americans

compared to the general population, the number surveyed in NHANES III was too small to reliably report prevalence comparisons of overweight and obesity for these populations.<sup>34</sup>

Racial and ethnic disparities in overweight may also occur in children and adolescents. Data for youth from NHANES III showed a similar pattern to that seen among adults. Mexican-American boys tended to have a higher prevalence of overweight than non-Hispanic black and non-Hispanic white boys. Non-Hispanic black girls tended to have a higher prevalence of overweight compared to non-Hispanic white and Mexican-American girls.<sup>15</sup> The National Heart, Lung and Blood Institute Growth and Health Study on overweight in children found a higher mean BMI for black girls aged 9 and 10 years, compared to white girls of the same ages.<sup>35</sup> This racial difference in BMI widened and was even greater at age 19.<sup>36</sup>

In addition to racial and ethnic and gender disparities, the prevalence of overweight and obesity also varies by age. Among both men and women, the prevalence of overweight and obesity increases with advancing age until the sixth decade, after which it starts to decline.<sup>30</sup>

**FIGURE 5: Age-Adjusted Prevalence of Overweight or Obesity in Selected Groups (NHANES III, 1988-1994)**



Sources: Centers for Disease Control and Prevention, National Center for Health Statistics, and National Health and Nutrition Examination Survey.

### SOCIOECONOMIC STATUS

Disparities in the prevalence of overweight and obesity also exist based on socioeconomic status. For all racial and ethnic groups combined, women of lower socioeconomic status (income  $\leq$  130 percent of poverty threshold) are approximately 50 percent more likely to be obese than those with higher socioeconomic status (income  $>$  130 percent of poverty threshold). Men are about equally likely to be obese whether they are in a low or high socioeconomic group.<sup>37</sup>

Among children, the relationship between socioeconomic status and overweight in girls is weaker than it is in women; that is, girls from lower-income families have not consistently been found to be overweight compared to girls from higher-income families. Among Mexican-American and non-Hispanic black children and adolescents, family income does not reliably predict overweight prevalence. However, non-Hispanic white adolescents from lower-income families experience a greater prevalence of overweight than those from higher-income families.<sup>15</sup>

## Health Benefits of Weight Loss

The recommendations to treat overweight and obesity are based on two rationales. First, overweight and obesity are associated with an increased risk of disease and death, as previously discussed.<sup>3,16,18</sup> Second, randomized controlled trials have shown that weight loss (as modest as 5 to 15 percent of excess total body weight) reduces the risk factors for at least some diseases, particularly cardiovascular disease, in the short term. Weight loss results in lower blood pressure, lower blood sugar and improved lipid levels.<sup>38</sup> While few published studies have examined the link between weight loss and reduced disease or death in the long term,<sup>39</sup> current data as well as scientific plausibility suggest this link.

Studies have shown that reducing risk factors for heart disease, such as blood pressure and blood cholesterol levels, lowers death rates from heart disease and stroke. Therefore, it is highly probable that weight loss that reduces these risk factors will reduce the number of deaths from heart disease and strokes. Trials examining the direct effects of weight loss on disease and death are cur-

rently under way.<sup>40,41</sup> For example, one trial shows that weight loss, a healthful diet, and exercise prevent the development of type 2 diabetes among persons who are overweight or obese.<sup>42</sup> The recently completed Diabetes Prevention Program from NIH also confirmed significant reductions in the risk for developing type 2 diabetes among obese subjects with impaired glucose tolerance through similar lifestyle interventions.<sup>43</sup>

**Editor's Note:** *This is the end of the research review that constitutes Section 1. The remaining sections are not reprinted here but are available on the World Wide Web at [www.surgeongeneral.gov/library](http://www.surgeongeneral.gov/library). Apart from Section 1, the full statement includes Section 2: Posing Questions and Developing Strategies; Section 3: The Power of People and Ideas; Section 4: Vision for the Future; Acknowledgments; Steering Committee Roster; Appendix A: Examples of Federal Programs and Initiatives; and Appendix B: Federal Program Resource List.*

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