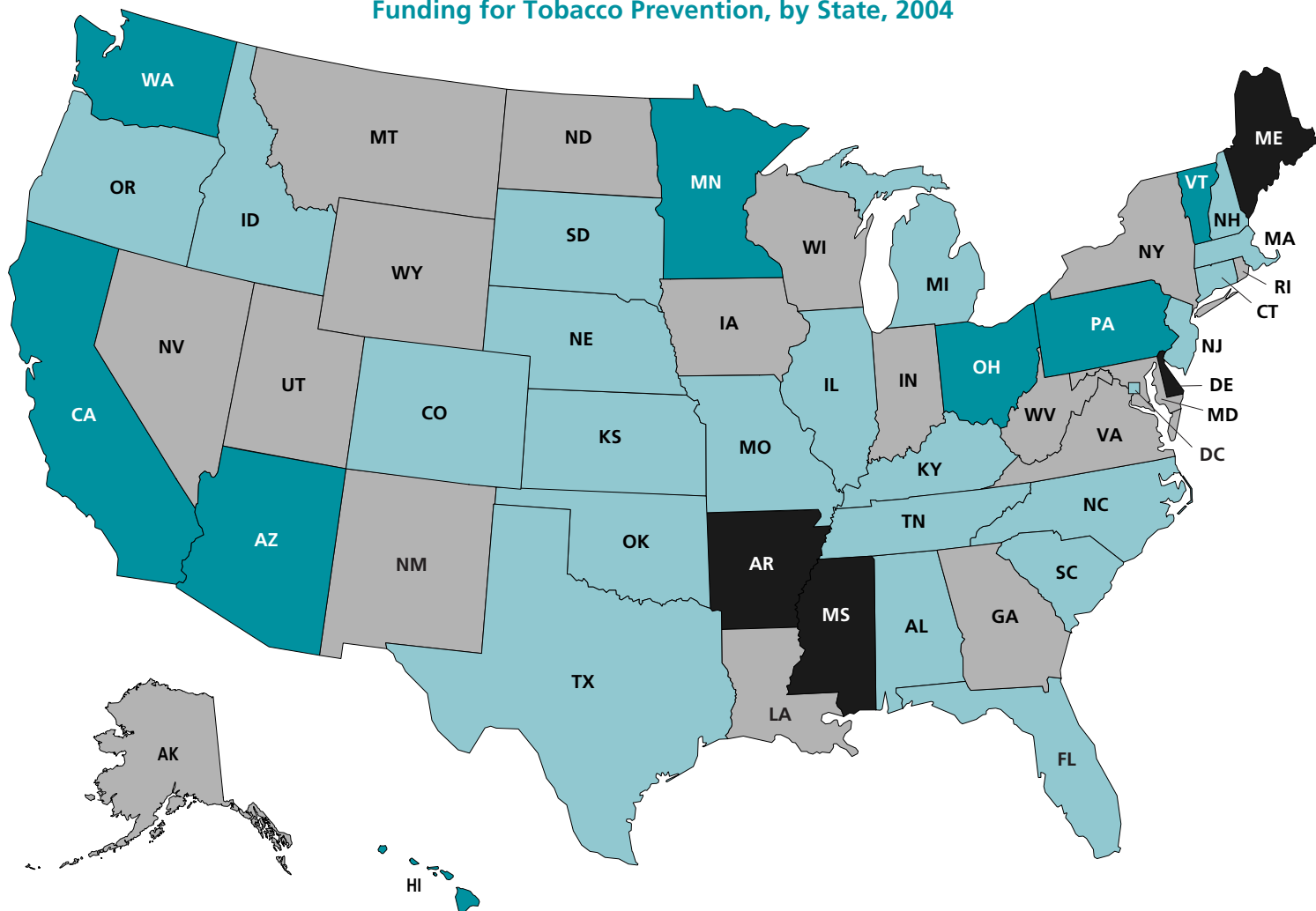


# Cancer Prevention & Early Detection Facts & Figures

# 2004

Funding for Tobacco Prevention, by State, 2004



Percent (%) of Centers for Disease Control and Prevention recommended funding level committed for tobacco control.

100% or more
  50% to 99%
  25% to 49%
  Less than 25%

Source: National Center for Tobacco-Free Kids, 2003.



# Contents

|   |    |
|---|----|
| <b>Preface</b>  | 1  |
| <b>Children and Adolescents</b>   | 2  |
| Youth Tobacco Use   | 2  |
| Overweight and Obesity, Physical Inactivity, and Nutrition Among Youth                      | 5  |
| Sun Protection  | 10 |
| <b>Adult Cancer Prevention</b>  | 12 |
| Adult Tobacco Use   | 12 |
| Overweight and Obesity, Physical Inactivity, and Nutrition Among Adults                     | 18 |
| American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention | 18 |
| <b>Cancer Screening</b>   | 26 |
| Breast Cancer Screening   | 26 |
| Cervical Cancer Screening   | 28 |
| Colon and Rectum Cancer Screening   | 30 |
| Screening Guidelines for the Early Detection of Cancer in Asymptomatic People               | 31 |
| Prostate Cancer Screening   | 34 |
| Barriers and Opportunities to Improve Cancer Screening                                      | 34 |
| <b>Statistical Notes</b>  | 36 |
| <b>Survey Sources</b>   | 38 |
| <b>References</b>   | 39 |
| <b>List of Tables and Figures</b>   | 44 |
| <b>Acknowledgments</b>  | 44 |

*This publication attempts to summarize current scientific information about cancer. Except when specified, it does not represent the official policy of the American Cancer Society.*

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# Preface

Tobacco use, physical inactivity, obesity, and poor nutrition are the major preventable causes of cancer and other diseases in the United States. In fact, scientific evidence suggests that approximately one-third of the estimated 563,700 cancer deaths expected to occur in 2004 will be related to poor nutrition, physical inactivity, overweight, obesity, and other lifestyle factors. Moreover, the American Cancer Society estimates that in 2004 more than 180,000 cancer deaths will be caused by tobacco use.<sup>1-3</sup>

Each year the American Cancer Society provides updated information on modifiable risk factors for cancer in this publication, *Cancer Prevention & Early Detection (CPED) Facts & Figures*, a companion publication of *Cancer Facts & Figures*. This year, for the first time, *CPED Facts & Figures* also highlights community, legislative, and environmental policies that can influence health behaviors and accelerate progress in prevention and early

detection. We describe success stories in local, state, and national efforts to facilitate tobacco avoidance, physical activity, and healthy diets. Also for the first time, this edition of *CPED Facts & Figures* separates the discussion of cancer prevention measures in children and adolescents from the information on cancer prevention in adults.

The American Cancer Society is dedicated to eliminating cancer as a major health problem by preventing cancer, saving lives, and diminishing suffering from cancer, through research, education, advocacy, and service. In 1999, the Society set bold challenge goals for the nation that, if met, would significantly lower cancer incidence and mortality rates and improve the quality of life for all cancer survivors by the year 2015. The American Cancer Society has also developed nationwide objectives that set the framework for achieving the 2015 goals. These objectives can be achieved by improved collaboration among government agencies, private companies, other nonprofit organizations, health care providers, policy-makers, insurers, and the American public.

## American Cancer Society Goals and Objectives

### 2015 Challenge Goals

- A 50% reduction in age-adjusted cancer mortality rates
- A 25% reduction in age-adjusted cancer incidence rates
- A measurable improvement in the quality of life (physical, psychological, social, and spiritual), from the time of diagnosis and for the balance of life, of all cancer survivors

### 2015 Nationwide Objectives

**Adult Tobacco Use:** Reduce to 12% the proportion of adults (18 and older) who use tobacco products.

**Youth Tobacco Use:** Reduce to 10% the proportion of young people (under 18) who use tobacco products.

**Nutrition:** Increase to 75% the proportion of persons who follow American Cancer Society guidelines with respect to consumption of fruits and vegetables as published in the *American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention*.

**Physical Activity:** Increase to 90% the proportion of youth (high school students) and to 60% the proportion of adults who follow American Cancer Society guidelines with respect to the appropriate level of physical activity as published in the *American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention*.

**Comprehensive School Health Education:** Increase to 50% the proportion of school districts that provide a comprehensive or coordinated school health education program.

**Sun Protection:** Increase to 75% the proportion of people of all ages who use at least two or more of the following protective measures which may reduce the risk of skin cancer: avoid the sun between 10 a.m. and 4 p.m.; wear sun-protective clothing when exposed to sunlight; use sunscreen with an SPF 15 or higher; and avoid artificial sources of ultraviolet light (e.g., sun lamps, tanning booths).

**Breast Cancer Early Detection:** Increase to 90% the proportion of women aged 40 and older who have breast screening consistent with American Cancer Society guidelines (by 2008).

**Colorectal Cancer Early Detection:** Increase to 75% the proportion of people aged 50 and older who have colorectal screening consistent with American Cancer Society guidelines.

**Prostate Cancer Early Detection:** Increase to 90% the proportion of men aged 50 and older who follow American Cancer Society detection guidelines for prostate cancer.

# Children and Adolescents

The health of young people, and the adults they will become, is critically linked to the establishment of healthy behaviors in childhood.<sup>4</sup> Risk factors such as tobacco addiction, unhealthy dietary patterns, and physical inactivity during childhood and adolescence can result in life-threatening cancers, cardiovascular diseases, and other major illnesses later in life.<sup>4</sup> Children who adopt healthy habits at an early age are more likely to continue these behaviors throughout life. Simply stated, it is far easier to establish healthy practices initially than to change behaviors later. For example:

- About half of youngsters who are overweight as children will remain overweight in adulthood,<sup>5</sup> while 70% of those who are overweight by adolescence will remain overweight as adults.<sup>6</sup>
- Physically active children are more likely to grow up to be physically active adults, whereas inactive children and youth are much more inclined to be sedentary adults.<sup>7</sup>
- Almost 90% of current adult smokers are addicted at or before age 18. About one-third of the 3,000 youth who take up smoking each day will eventually die as adults from a tobacco-related disease, including many types of cancer.<sup>8</sup>

Not only is childhood a formative period, but it also presents an important opportunity, through health education in the schools, to teach children healthy lifestyle habits. There are more than 50 million students currently enrolled in the nation's public and private elementary and high schools (grades K-12). The 129,000 schools in the United States provide an organizational structure through which health information and prevention programs can be delivered.<sup>4</sup>

Furthermore, children are greatly influenced by their social environment, which in turn, is strongly influenced by public policies. For instance, adolescents are more likely to initiate smoking if their film idols smoke in the movies, their favorite sport is sponsored by a tobacco company, they see people smoking all around them, and tobacco products are cheap and readily available.<sup>8</sup>

Similarly, children are more likely to engage in sports and other forms of physical activity if safe and enjoyable participation in these activities is encouraged at school, in after-school care programs, and in their communities.<sup>9</sup>

Children who can safely walk or bike to school are more likely to do so.<sup>9</sup> Community support, public health policy, and legislation offer multiple opportunities to improve the health behavior of future generations.

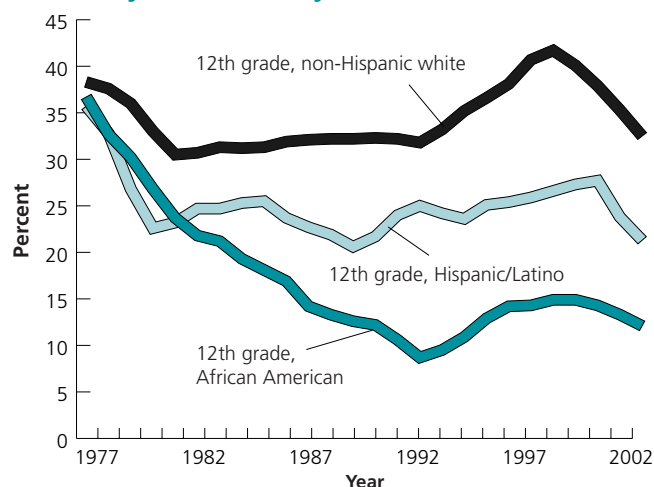
## Youth Tobacco Use

Reducing tobacco initiation among young people is critical to the prevention of future tobacco-related cancers. In 2001, 28.5% of US high school students reported smoking at least one day in the last 30 days, with 13.8% reporting frequent smoking or smoking for 20 or more of the last 30 days (Table 1A).<sup>10</sup> According to the Monitoring the Future survey, cigarette smoking varies by race/ethnicity among US 12th graders, with the highest prevalence among non-Hispanic whites, intermediate prevalence among Hispanics/Latinos, and the lowest prevalence among African Americans (Figure 1A).

## Trends Over Time

From 1977 to 1992, the decrease in smoking prevalence was greater and continued longer among African American students than among non-Hispanic white or Hispanic/Latino students. Figure 1A shows that the smoking prevalence among all 12th grade students ranged from 35% to 40% in 1977, with a dramatic decrease among African American students, to a low of 10%, in 1992.<sup>11</sup> However, for all three racial/ethnic groups, smoking prevalence increased again during the 1990s.<sup>11</sup> This period coincided with a major increase in tobacco company expenditures for promotion of

**Figure 1A. Current\* Cigarette Smoking Among 12th Graders, by Race/Ethnicity, 1977-2002**

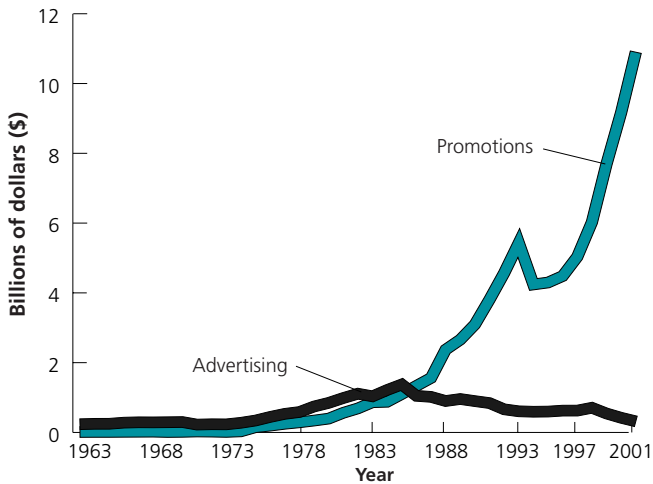


\*Used cigarettes in the last 30 days.

Source: Monitoring the Future Survey, 1975-2002, National Institute on Drug Abuse.<sup>11</sup>  
American Cancer Society, Surveillance Research



**Figure 1B. Domestic Expenditures on Cigarette Advertising and Promotion, United States, 1963-2001**



**Note:** Advertising includes newspaper, magazine, outdoor, transit, television, radio, and Internet expenditures. Promotions include point-of-sale, promotional allowances, sampling distribution, specialty item distribution, direct mail, public entertainment, testimonial expenditures, coupons, and retail value added.

**Source:** Federal Trade Commission, 2003.<sup>12</sup>

American Cancer Society, Surveillance Research

cigarettes, following legislative restrictions on tobacco advertising that occurred in the 1980s (Figure 1B).<sup>12</sup> These promotions specifically targeted young people by giving or selling T-shirts, caps, sunglasses, key chains, and sporting goods bearing a cigarette brand's logo and by sponsoring sporting events.<sup>12</sup>

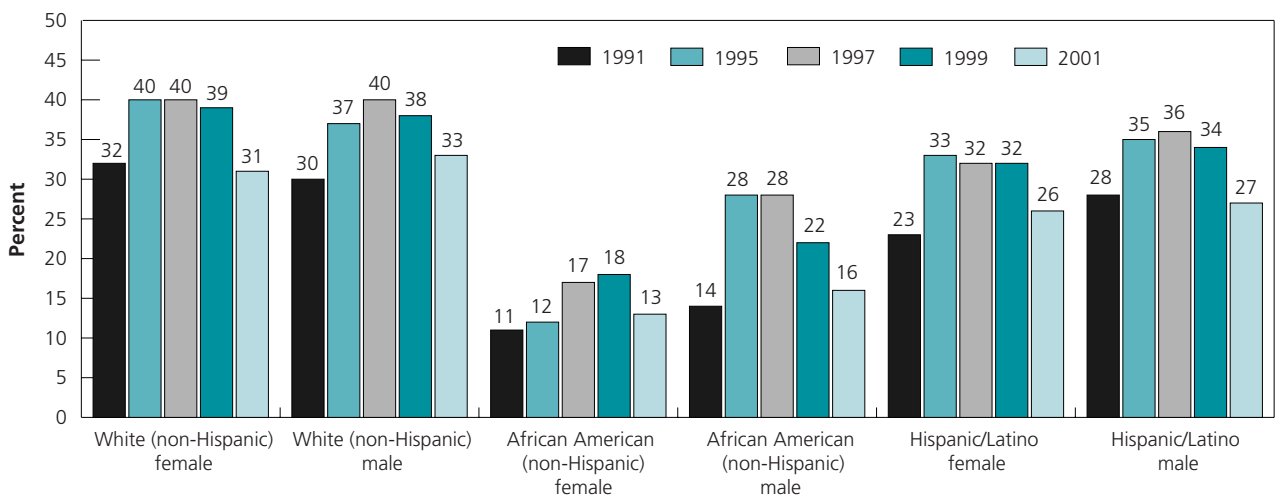
Since 1997, smoking prevalence has decreased for both male and female high school students in all major

racial/ethnic subgroups (Figure 1C).<sup>13</sup> These decreases occurred despite persistent promotions by the tobacco companies<sup>12</sup> and can be attributed, at least in part, to rising cigarette prices and counter-advertising.<sup>14-16</sup> In 2002 alone, 21 states raised their cigarette tax, which is more states than in the previous five years combined.<sup>15</sup>

### Comprehensive Approach to Youth Tobacco Control

Although some recent state trends in youth smoking have been favorable, US prevalence remains high (28.5%),<sup>10</sup> and continued efforts are needed to sustain progress. In 2000, the Surgeon General outlined a comprehensive approach to tobacco control, including increased taxes on cigarettes. States that have imposed excise taxes on cigarettes generally have lower youth smoking prevalence. Other studies have shown that comprehensive tobacco control programs, including increases in excise tax, effectively reduce the rates of adolescent smoking. Advocacy to increase excise taxes, and, in turn, increase cigarette prices, to create smoke-free school environments, and to restrict access to

**Figure 1C. Current\* Cigarette Smoking Among High School Students, by Race/Ethnicity and Gender, 1991-2001**



\*Smoked cigarettes on one or more of the 30 days preceding the survey.

**Source:** Youth Risk Behavior Surveillance System, 1991, 1995, 1997, 1999, 2001, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention.<sup>13</sup>

American Cancer Society, Surveillance Research

Youth-oriented counter-advertising is effective at helping decrease smoking prevalence among high school students by changing perceptions about the social acceptability of cigarette use.

cigarettes are effective ways to decrease smoking initiation and to encourage youth to quit smoking.<sup>17</sup>

School-based smoking prevention programs can be effective as part of comprehensive tobacco control programs.<sup>17</sup> By middle or junior high school, more than one-third of children (36.3%) have tried cigarette smoking; by high school, almost two-thirds have.<sup>10,18</sup> The early age of cigarette initiation warrants that smoking prevention classes be taught from elementary school to high school, since early adolescence (age 11 to 15, or sixth through tenth grade) is when young people are most likely to try smoking for the first time.<sup>17</sup> The Surgeon General recommends that tobacco use prevention begin at or before sixth grade; however, 25% of states do not require that tobacco use prevention be taught in elementary schools.<sup>8,19</sup>

Because the long-term consequences of smoking may seem remote to young people, smoking prevention materials geared to youth should focus on short-, as well as long-term consequences of smoking, such as lower sports performance, breath odor, and reduced physical attractiveness due to staining of teeth and fingers.<sup>20</sup> In addition to youth-oriented programming, a cornerstone of one Florida anti-tobacco campaign was to change attitudes about the perceived attractiveness of cigarette smoking. This program sought input from teen advisors in developing a “truth” campaign – a specially designed anti-tobacco media campaign to counter the perception of smoking as cool and rebellious. Following implementation of the program, there were significant declines in cigarette smoking among middle and high school students.<sup>17</sup>

Similarly, Massachusetts targets its youth tobacco control program with community-based youth programs, youth-specific statewide media campaigns, and school-based tobacco education. The implementation of these efforts has been associated with a decline from 36% to 30% from 1995 to 1999 among students who reported smoking cigarettes on one or more of the 30 days preceding the survey.<sup>21</sup>

In the absence of intervention, adolescent smokers will most likely become adult smokers.<sup>8</sup> However, in 2000, more than half the middle and high school students who



were current cigarette smokers wanted to stop smoking, and nearly 60% had made an attempt to quit smoking cigarettes during the last 12 months.<sup>18</sup>

Smoking-cessation interventions that have proven most effective in adults have not been studied extensively in adolescents.<sup>22</sup> Two recent publications have, however, begun to address this need. In the spring of 2000, the American Cancer Society and a number of its health organization partners in the Youth Tobacco Cessation Collaborative published *Youth and Young Adult Tobacco-Use Cessation: A National Blueprint for Action*,<sup>23</sup> and, in 2003, a supplement to the *American Journal of Health Behavior* was devoted to youth tobacco cessation.<sup>24-30</sup>

### Other Tobacco Products

While cigarettes remain the primary tobacco product used by youth, smokeless tobacco and cigars have gained popularity. Cigars are the second most popular type of tobacco in all states except Montana, Wyoming, and South Dakota, where smokeless tobacco is second to cigarettes.<sup>10</sup> Tobacco usage varies by race and gender. Whereas non-Hispanic white and Hispanic/Latino students smoke predominantly cigarettes, African Americans were equally likely to smoke cigarettes and cigars. Male and female students were equally likely to smoke cigarettes, but males were nine times more likely to use smokeless tobacco and three times more likely to smoke cigars than females. Table 1A provides data on current and frequent cigarette smoking, cigar use, and smokeless tobacco use in states and cities for which these data are available for 2001.

Alternative tobacco products like bidis (small brown cigarettes from India made of tobacco wrapped in a leaf and tied with a thread) and kreteks (flavored cigarettes

**Table 1A. Tobacco Use, High School Students, by State and City, 2001**

|                      | % Current<br>cigarette<br>smoking* | % Frequent<br>cigarette<br>smoking† | % Current<br>cigar use‡ | % Current<br>smokeless<br>tobacco use§ |                    | % Current<br>cigarette<br>smoking* | % Frequent<br>cigarette<br>smoking† | % Current<br>cigar use‡ | % Current<br>smokeless<br>tobacco use§ |
|----------------------|------------------------------------|-------------------------------------|-------------------------|--|--------------------|------------------------------------|-------------------------------------|-------------------------|--|
| <b>United States</b> | <b>28.5</b>                        | <b>13.8</b>                         | <b>15.2</b>             | <b>8.2</b>                             | <b>State</b>       |                                    |                                     |                         |  |
| <b>State</b>         |                                    |                                     |                         |  | South Carolina     | 27.6                               | 14.1                                | 17.6                    | 8.1                                    |
| Alabama              | 23.7                               | 12.4                                | 15.9                    | 9.8                                    | South Dakota       | 33.1                               | 17.3                                | 14.3                    | 15.1                                   |
| Arkansas             | 34.7                               | 18.8                                | 19.3                    | 13.5                                   | Tennessee¶         | 29.1                               | 15.6                                | 16.9                    | 12.0                                   |
| Colorado¶            | 26.7                               | 12.5                                | 16.4                    | 9.2                                    | Texas              | 28.4                               | 10.4                                | 15.6                    | 8.8                                    |
| Delaware             | 24.2                               | 12.8                                | 12.7                    | 4.8                                    | Utah               | 8.3                                | 4.2                                 | 4.1                     | 3.8                                    |
| Florida              | 21.5                               | 9.3                                 | 15.3                    | 5.8                                    | Vermont            | 23.7                               | 12.7                                | 12.4                    | 5.2                                    |
| Hawaii¶              | 15.0                               | 6.1                                 | 6.2                     | 2.9                                    | Wisconsin          | 32.6                               | 16.4                                | 17.3                    | 9.1                                    |
| Idaho                | 19.1                               | 9.0                                 | 11.1                    | 8.3                                    | Wyoming            | 28.4                               | 13.6                                | 16.5                    | 18.1                                   |
| Illinois¶#           | 25.3                               | 12.0                                | 11.9                    | 4.2                                    | <b>City</b>        |                                    |                                     |                         |  |
| Indiana¶             | 28.5                               | 16.2                                | 14.2                    | 6.5                                    | Boston, MA         | 15.4                               | 4.9                                 | 8.8                     | 2.3                                    |
| Iowa¶                | 29.7                               | 14.1                                | 16.1                    | 11.8                                   | Chicago, IL        | 24.7                               | 7.6                                 | 14.1                    | 2.6                                    |
| Kentucky¶            | 33.0                               | 18.8                                | 14.8                    | 12.2                                   | Dallas, TX         | 17.8                               | 3.6                                 | 16.3                    | 2.5                                    |
| Louisiana¶#          | 25.0                               | 12.5                                | 17.6                    | 8.5                                    | Detroit, MI¶       | 12.4                               | 4.1                                 | 12.4                    | 4.1                                    |
| Maine                | 24.8                               | 14.0                                | 12.0                    | 6.2                                    | Dist. of Columbia¶ | 13.1                               | 3.2                                 | 10.2                    | 6.4                                    |
| Massachusetts        | 26.0                               | 13.2                                | 13.1                    | 4.4                                    | Ft. Lauderdale, FL | 18.3                               | 7.0                                 | 13.1                    | 3.0                                    |
| Michigan             | 25.7                               | 12.7                                | 14.9                    | 7.7                                    | Houston, TX        | 21.8                               | 4.6                                 | 12.2                    | 3.5                                    |
| Mississippi          | 23.6                               | 11.5                                | 15.7                    | 8.2                                    | Los Angeles, CA    | 14.5                               | 2.7                                 | 11.4                    | 3.0                                    |
| Missouri             | 30.3                               | 18.0                                | 16.4                    | 10.4                                   | Miami, FL          | 16.9                               | 5.4                                 | 11.5                    | 2.6                                    |
| Montana              | 28.5                               | 14.9                                | 14.8                    | 15.7                                   | Milwaukee, WI¶     | 19.8                               | 9.9                                 | 14.9                    | 5.9                                    |
| Nebraska¶            | 30.5                               | 14.5                                | 14.6                    | 9.8                                    | New Orleans, LA¶   | 11.9                               | 4.0                                 | 10.0                    | 2.7                                    |
| Nevada               | 25.2                               | 11.3                                | N/A                     | 6.9                                    | New York City, NY  | 17.6                               | 7.5                                 | 5.1                     | 1.1                                    |
| New Hampshire¶       | N/A                                | N/A                                 | 13.4                    | 5.6                                    | Orlando, FL        | 17.8                               | 8.8                                 | 14.8                    | 4.6                                    |
| New Jersey           | 29.4                               | 14.9                                | 15.6                    | 7.1                                    | Palm Beach, FL     | 21.4                               | 8.5                                 | 15.3                    | 5.3                                    |
| New York¶#           | 29.8                               | 16.4                                | 14.3                    | 5.9                                    | Philadelphia, PA   | 15.8                               | 6.4                                 | 7.3                     | 2.2                                    |
| North Carolina       | 27.8                               | 14.5                                | N/A                     | N/A                                    | San Bernardino, CA | 12.0                               | 3.4                                 | 12.5                    | 3.8                                    |
| North Dakota         | 35.3                               | 18.7                                | N/A                     | 13.2                                   | San Diego, CA      | 17.1                               | 4.7                                 | 11.9                    | 2.5                                    |
| Rhode Island         | 24.8                               | 14.2                                | 14.0                    | 3.9                                    | San Francisco, CA  | 13.3                               | 3.7                                 | 8.7                     | N/A                                    |

\*Smoked cigarettes on one or more of the 30 days preceding the survey. †Smoked cigarettes on 20 or more of the 30 days preceding the survey. ‡Smoked cigars, cigarillos, or little cigars on one or more of the 30 days preceding the survey. §Used chewing tobacco or snuff on one or more of the 30 days preceding the survey. ¶Unweighted data (see Statistical Notes, p. 36). #Survey did not include students from one of the state's largest school districts. N/A = Data not available. **Note:** Data are not available for all states since participation in the Youth Risk Behavior Surveillance System is a voluntary collaboration between a state's departments of health and education.

**Source:** Youth Risk Behavior Surveillance System, 2001, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2002.<sup>10</sup>

American Cancer Society, Surveillance Research

containing tobacco and clove extract) are used less commonly.<sup>18</sup> Less than 3% of middle (2.4%) and high (2.6%) school students used bidis on one or more of the 30 days preceding the survey.<sup>18</sup> Similarly, less than 3% of middle (2%) and high (2.7%) school students used kreteks on one or more of the 30 days preceding the survey.<sup>18</sup> All forms of tobacco are addictive and cause cancer and other life-threatening diseases.

## Overweight and Obesity, Physical Inactivity, and Nutrition Among Youth

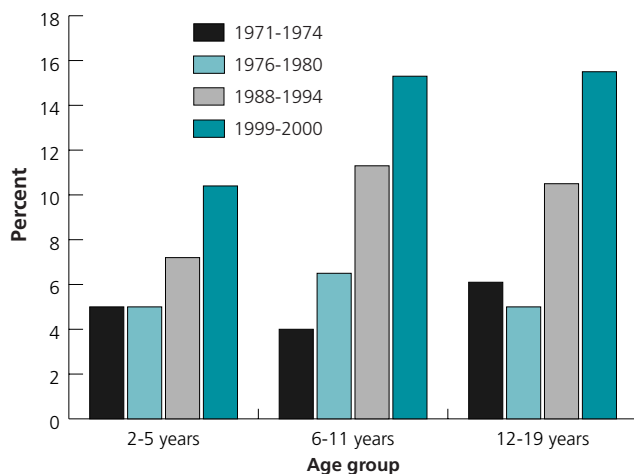
### Overweight and Obesity

Individuals who become overweight in childhood and adolescence are more likely to be overweight or obese as adults.<sup>31</sup> Some of the adverse health conditions seen in overweight and obese adults, such as type II diabetes or

high cholesterol levels, are appearing in overweight and obese adolescents.<sup>32</sup> Because at least half of overweight children become overweight adults,<sup>5,6</sup> an increase in childhood overweight and obesity will result in future obese adult populations having increased risk of developing cancer, heart disease, type II diabetes, and other serious chronic diseases.<sup>33</sup>

The percentage of overweight children and adolescents increased dramatically in the late 1980s and 1990s (Figure 1D). The increase occurred among boys and girls of all age groups and race/ethnicities, although Mexican American girls and African American boys experienced the greatest increases.<sup>34</sup> Table 1B shows the percentages of youth who are either at risk for overweight or who are overweight in states and major cities in the US.

**Figure 1D. Overweight\* Children and Adolescents, by Age Group, 1971-2000**



\*At or above the 95th percentile for body mass index by age and sex based on reference data.

Source: National Health and Nutrition Examination Survey, 1971-1974, 1976-1980, 1988-1994, 1999-2000, National Center for Health Statistics, Centers for Disease Control and Prevention.<sup>34</sup>

American Cancer Society, Surveillance Research



### Television Viewing: A Modifiable Risk Factor

Watching television is one modifiable factor that may contribute to obesity in children.<sup>37</sup> Other than sleeping, children and adolescents spend more time in front of a television than in any other activity.<sup>38</sup> It competes with other activities that could involve physical activity, allows children and adolescents to view advertisements for high-calorie foods with little nutrient value, and encourages between-meal snacking.<sup>39</sup> The Third National Health and Nutrition Examination Survey, conducted from 1988 to 1994, found that more than 25% of children in the US watched at least four hours of television per day, and children who watched four or more hours of television per day had a significantly greater body mass index than those who watched less than two hours per day.<sup>40</sup> Furthermore, having a television in the bedroom during childhood has been reported to be a strong predictor of being overweight.<sup>32</sup>

Three or more hours of television watching per day is considered an indicator for sedentary behavior. The proportion of high school students who watch three hours or more of television daily significantly correlates with the proportion who are overweight or at risk of becoming overweight in the 18 states for which data are available in 2001 (Figure 1E). In other words, states in which the proportion of high school students who watch three or more hours of television per day is high tend to have a higher prevalence of overweight among youth. It should be noted that this relationship does not prove a causal relation, but it does signify an important issue for further study.

Of note is that television watching is higher among African Americans and Hispanics/Latinos compared to non-Hispanic whites, and is higher among ninth grade students than eleventh and twelfth grade students.<sup>10</sup> These same subgroups are also at greater risk for becoming overweight or for being overweight.<sup>10</sup>

Obesity occurs when caloric intake exceeds caloric expenditures i.e., physical activity. Even a small excess in caloric intake consumed over time may upset this delicate balance.<sup>35</sup> Physical activity, by itself, cannot offset large excesses in caloric intake. For example, 45 minutes of moderate physical activity are needed to burn off the calories in a 20-ounce soda.<sup>36</sup> The largest sugar-containing soft drink serving and its free refill offered in some fast-food chains provide half of an adult's daily caloric (but not nutritional) needs.<sup>36</sup>

A combination of increasing physical activity and preventing excess calorie consumption is needed to prevent obesity in children. The American Academy of Pediatrics has released recommendations for the prevention of obesity in children.<sup>32</sup> These include:

- Limit television and video time to a maximum of two hours per day.
- Routinely promote physical activity, including unstructured play, at home, in school, in childcare settings, and throughout the community.
- Encourage parents and caregivers to promote healthy eating patterns by offering nutritious snacks, such as vegetables and fruits, low-fat dairy foods, and whole grains; encouraging children's autonomy in self-regulation of food intake and setting appropriate limits on choices; and modeling healthy food choices.



**Table 1B. Overweight and Related Factors, High School Students, by State and City, 2001**

|                        | %<br>At risk for<br>becoming<br>overweight* | %<br>Overweight† | % Watched<br>three or<br>more hours<br>per day of<br>television‡ | %<br>Moderate<br>physical<br>activity§ | %<br>Vigorous<br>physical<br>activity¶ | %<br>Attended<br>physical<br>education<br>classes daily | %<br>Played<br>on one or<br>more sports<br>teams# | % Eating<br>five or more<br>fruits and<br>vegetables<br>a day** |
|------------------------|---|------------------|--|--|--|---|---|---|
| <b>United States</b>   | <b>13.6</b>                                 | <b>10.5</b>      | <b>38.3</b>  | <b>25.5</b>                            | <b>64.6</b>                            | <b>32.2</b>   | <b>55.2</b>                                       | <b>21.4</b>   |
| <b>State</b>           |   |                  |  |  |  |   |   |   |
| Alabama                | 15.2  | 12.3             | 46.1   | 20.2                                   | 58.4                                   | 31.8  | 52.5  | 13.1  |
| Arkansas               | 15.9  | 13.8             | 42.9   | 23.3                                   | 61.5                                   | 30.2  | 54.1  | 19.9  |
| Colorado††             | 8.6   | 7.1              | 29.2   | 26.2                                   | 70.2                                   | 24.4  | 63.3  | 22.0  |
| Delaware               | 15.0  | 10.8             | 40.7   | 25.4                                   | 62.5                                   | 32.0  | 56.0  | 24.9  |
| Florida                | 14.3  | 10.4             | 44.9   | 22.0                                   | 58.8                                   | 25.4  | 49.6  | 20.3  |
| Hawaii†††              | 11.9  | 12.1             | 42.2   | 19.2                                   | 55.8                                   | 10.1  | 49.3  | 16.4  |
| Idaho                  | 10.7  | 7.2              | 24.1   | 29.3                                   | 67.1                                   | 30.4  | 61.8  | 18.1  |
| Illinois†† ††          | 12.9  | 9.5              | 29.0   | 28.5                                   | 74.1                                   | 70.6  | 66.8  | 24.8  |
| Indiana††              | 13.1  | 11.4             | 33.4   | 24.4                                   | 61.5                                   | 26.4  | 55.9  | 16.2  |
| Iowa††                 | 14.0  | 9.8              | 24.9   | 29.3                                   | 74.1                                   | 14.0  | 68.3  | 18.9  |
| Kentucky††             | 15.2  | 12.3             | 34.4   | 20.3                                   | 59.8                                   | 19.2  | 56.1  | 19.2  |
| Louisiana†† ††         | 11.4  | 13.0             | 45.8   | 19.4                                   | 55.4                                   | 46.5  | 52.6  | 16.9  |
| Maine                  | 14.5  | 10.4             | 24.4   | 29.1                                   | 65.9                                   | 4.8   | 59.6  | 25.0  |
| Massachusetts          | 15.0  | 10.0             | 30.4   | 25.1                                   | 62.8                                   | 17.7  | 53.8  | N/A   |
| Michigan               | 13.3  | 10.7             | 30.5   | 26.9                                   | 64.5                                   | 29.4  | 60.8  | 20.6  |
| Mississippi            | 15.4  | 14.0             | 54.7   | 19.8                                   | 54.9                                   | 22.7  | 54.8  | 20.8  |
| Missouri               | 15.0  | 12.8             | 38.1   | 24.2                                   | 64.7                                   | 30.0  | 52.7  | 18.7  |
| Montana                | 11.4  | 6.1              | 23.5   | 31.0                                   | 67.6                                   | 31.3  | 60.1  | 19.4  |
| Nebraska††             | 11.3  | 9.0              | 25.7   | 27.7                                   | 68.3                                   | 40.0  | 67.6  | 18.2  |
| Nevada                 | N/A   | N/A              | N/A  | 27.9                                   | 66.3                                   | N/A   | N/A   | N/A   |
| New Hampshire††        | 14.1  | 8.6              | 27.3   | N/A                                    | 62.2                                   | N/A   | 60.7  | N/A   |
| New Jersey             | 14.6  | 10.1             | 40.7   | 28.5                                   | 65.6                                   | 66.5  | 59.0  | 25.9  |
| New York††† ††         | 13.8  | 10.6             | 31.5   | 23.9                                   | 65.8                                   | 3.6   | 58.8  | 20.7  |
| North Carolina         | 14.3  | 12.9             | N/A  | 23.5                                   | 64.0                                   | 34.4  | N/A   | 17.8  |
| North Dakota           | 12.2  | 9.2              | 26.3   | 25.7                                   | 60.4                                   | 31.6  | 61.6  | 18.1  |
| Rhode Island           | 14.2  | 9.2              | 34.1   | 29.2                                   | 66.1                                   | 15.6  | 56.0  | 27.4  |
| South Carolina††       | 14.3  | 12.9             | 48.2   | 21.2                                   | 59.4                                   | 28.1  | N/A   | 17.3  |
| South Dakota           | 12.7  | 7.6              | 24.8   | 24.8                                   | 58.0                                   | 12.0  | 63.7  | 15.9  |
| Tennessee††            | 14.0  | 13.2             | 44.6   | 25.4                                   | 61.2                                   | 25.6  | 50.8  | 20.2  |
| Texas                  | 14.8  | 14.2             | 44.4   | 22.0                                   | 61.8                                   | 32.9  | 56.7  | 19.9  |
| Utah                   | 8.4   | 6.2              | 17.7   | 29.5                                   | 67.1                                   | 23.7  | 58.4  | 22.9  |
| Vermont                | 12.2  | 9.7              | N/A  | 28.2                                   | 67.2                                   | 27.7  | N/A   | 26.4  |
| Wisconsin              | 14.3  | 9.6              | N/A  | 27.6                                   | 64.9                                   | N/A   | 60.0  | N/A   |
| Wyoming                | 10.8  | 6.6              | 24.7   | 30.0                                   | 69.0                                   | 30.9  | 63.8  | 21.0  |
| <b>City</b>            |   |                  |  |  |  |   |   |   |
| Boston, MA             | 17.0  | 12.4             | 47.8   | 17.3                                   | 49.8                                   | 11.0  | 45.2  | N/A   |
| Chicago, IL            | 18.7  | 12.7             | 58.6   | 25.5                                   | 63.5                                   | 57.1  | 54.1  | 29.5  |
| Dallas, TX             | 17.6  | 16.1             | 55.4   | 16.5                                   | 54.9                                   | 10.3  | 48.0  | 14.9  |
| Detroit, MI††          | 18.5  | 18.0             | 59.3   | 21.1                                   | 48.8                                   | 28.3  | 44.2  | 18.7  |
| District of Columbia†† | 15.0  | 14.6             | 52.6   | 12.3                                   | 40.7                                   | 14.3  | 41.4  | 18.5  |
| Ft. Lauderdale, FL     | 12.3  | 8.9              | 49.6   | 18.0                                   | 56.9                                   | 23.7  | 48.0  | 22.6  |
| Houston, TX            | 16.5  | 12.6             | 58.9   | 18.3                                   | 55.2                                   | 17.1  | 47.5  | 24.3  |
| Los Angeles, CA        | 16.5  | 12.4             | 44.6   | 19.0                                   | 62.1                                   | 55.1  | 50.4  | 21.6  |
| Miami, FL              | 15.7  | 9.6              | 53.5   | 19.1                                   | 54.5                                   | 15.4  | 43.8  | 23.5  |
| Milwaukee, WI††        | 18.1  | 13.1             | N/A  | 23.6                                   | 49.5                                   | N/A   | 53.9  | N/A   |
| New Orleans, LA††      | 16.6  | 13.4             | 66.8   | 18.6                                   | 47.4                                   | 49.1  | 48.9  | 26.7  |
| New York City, NY      | 15.4  | 11.5             | 59.0   | 25.1                                   | 59.5                                   | 45.6  | 44.6  | 24.1  |
| Orlando, FL            | 14.0  | 11.3             | 44.9   | 26.5                                   | 56.5                                   | 16.5  | 48.0  | 19.7  |
| Palm Beach, FL         | 12.9  | 8.8              | 45.6   | 23.4                                   | 54.8                                   | 21.1  | 46.3  | 23.3  |
| Philadelphia, PA       | 17.1  | 15.2             | 56.7   | 22.4                                   | 52.7                                   | 23.8  | 48.5  | 15.5  |
| San Bernardino, CA     | 14.8  | 14.3             | 44.3   | 23.9                                   | 57.0                                   | 50.8  | 52.5  | 20.8  |
| San Diego, CA          | 14.2  | 7.8              | 41.8   | 25.7                                   | 65.0                                   | 40.9  | 55.5  | 20.1  |
| San Francisco, CA      | 11.5  | 10.6             | 45.0   | 22.1                                   | N/A                                    | 34.3  | 44.5  | N/A   |

\*Students who were at or above the 85th percentile but below the 95th percentile for body mass index by age and sex based on reference data. †Students who were at or above the 95th percentile for body mass index by age and sex based on reference data. ‡During an average school day. §Activities that did not make students sweat and breathe hard for 30 minutes or more on five or more of the seven days preceding the survey. ¶Activities that made students sweat and breathe hard for 20 minutes or more on three or more of the seven days preceding the survey. #During the 12 months preceding the survey. \*\*Had eaten five or more servings per day of green salad, potatoes (excluding french fries, fried potatoes, or potato chips), carrots or other vegetables, 100% fruit juice, or fruit during the seven days preceding the survey. ††Unweighted data (see Statistical Notes, p. 36). †††Survey did not include students from one of the state's largest school districts. N/A = Data not available. **Note:** Data are not available for all states since participation in the Youth Risk Behavior Surveillance System is a voluntary collaboration between a state's departments of health and education.

**Source:** Youth Risk Behavior Surveillance System, 2001, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2002.<sup>10</sup>

American Cancer Society, Surveillance Research

## Body Mass Index for Youth and Adolescents

As children grow and mature, their body composition changes dramatically. The definitions of overweight and obesity are different for youth than for adults. Growth charts showing the entire distribution of height, weight, and body mass index (BMI) were revised in 2000<sup>41</sup> and are available at the Centers for Disease Control and Prevention's National Center for Health Statistics Web site at [www.cdc.gov/growthcharts](http://www.cdc.gov/growthcharts). These growth charts are the recommended approach to evaluating overweight and obesity in children and youth. In this report, the following definitions are used:

- Overweight: 95th or higher percentile for BMI
- At risk of becoming overweight: 85th to 94th percentile for BMI

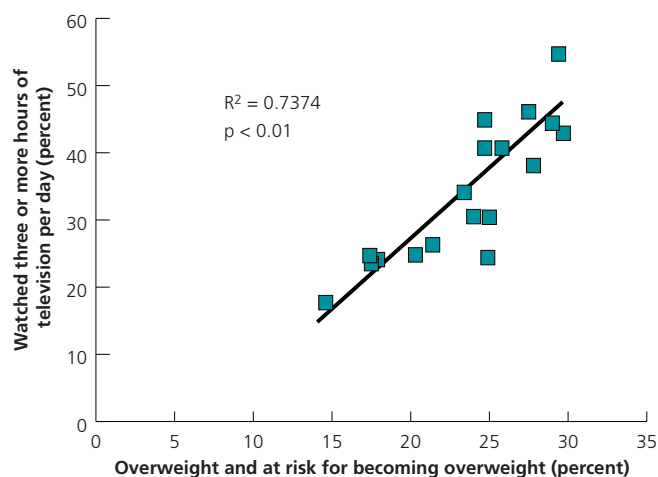
## Physical Activity

There are no national estimates of physical activity levels among children under age 12 because self-reports in this age group are less reliable than in older children or adolescents.<sup>42</sup> Based on YRBSS data from 2001, more than half of high school students are vigorously active, and 20%-25% are moderately active on a regular basis.<sup>10</sup> However, physical activity levels show a steady decline from age 12 to age 21.<sup>43</sup> Few studies address the reason for this decline. One cohort study that examined the longitudinal decline in physical activity among white and African American girls (9 and 10-year-olds at baseline) reported substantial declines in physical activity levels over a 10-year period – a 100% decline in African American girls and 64% in white girls from baseline levels.<sup>44</sup> This study found that smoking initiation in adolescence was associated with the decline in physical activity levels.<sup>44</sup> It is hypothesized that as age and grade level increase, academic school demands increase, the opportunities for social activities for adolescents that involve physical activity decreases, and other extracurricular activities compete for time that could be spent in leisure-time physical activity.

Similarly, data on long-term trends in physical activity among children and adolescents are quite limited. However, it has been suggested that long-term declines in physical activity among youth have contributed to the increase in overweight and obesity in this population. Factors contributing to the long-term decline in physical activity among youth include the increasingly sedentary nature of leisure-time activities, decrease in daily activities such as walking or biking to school and household chores, and changes in availability and requirements of school physical education programs.<sup>32,45</sup> Vigorous, healthy physical activity, such as playing basketball, may have been displaced by more sedentary activities, such as playing video games, watching television or videotapes, or using a computer.

The potential influence of one's physical environment on health has been recognized only recently.<sup>46</sup> Urban sprawl reduces opportunities to walk or bike from home to school, shopping, or other destinations because of concerns about distance and safety.<sup>47</sup> According to the 2001 National Household Travel Survey, childrens' walking trips have declined by 60% since 1977; walking and biking to school have declined by 50% since 1969.<sup>35</sup> Distance, traffic safety, and fear of crime contributed to these declines.<sup>48</sup>

**Figure 1E. Combined Youth Overweight\* Versus Three or More Hours of Television Watching, by State, 2001**



\*At or above the 95th percentile for body mass index by age and sex based on reference data. **Note:** See Statistical Notes (p. 37), for explanation of correlation.

**Source:** Youth Risk Behavior Surveillance System, 2001, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention.<sup>10</sup>

American Cancer Society, Surveillance Research



For some communities, environmental changes such as increased housing density, walking and bicycle trails, and urban redesign will require long-term planning and investment,<sup>49</sup> but most communities can begin to make some progress. In Marin County, California, a successful youth program encourages children to walk or bike to school by mapping safe routes to school, providing drinks and treats for those who participate, sponsoring contests, and developing newsletters and promotions.<sup>50</sup> Since its inception, Marin County's *Safe Routes to School Program* has increased the trips made to school by walking (64%) and biking (114%).<sup>50</sup> Similarly, the Centers for Disease Control and Prevention's program *KidsWalk-to-School* also seeks to increase opportunities for daily physical activity by encouraging children to walk to and from school in groups accompanied by adults.<sup>51</sup>

In addition, increased time for academic instruction limits recess, unstructured playtime, and other opportunities for physical activity, including physical education classes. Many school districts do not require daily physical education for students in kindergarten through 12th grades.<sup>7</sup> In 2001, only 32.2% of high school students attended physical education daily (Table 1B).<sup>10</sup> Parents can advocate for school district policies that require daily physical education or that encourage the development of competitive and non-competitive activities.<sup>52</sup>

Participation in organized sports offers many social and physical benefits to children.<sup>53</sup> Nationally, 55.2% of high school students reported playing on one or more sports teams during 2001.<sup>10</sup> Participation rates were higher for males (60.9%) than females (49.9%).<sup>10</sup> However, the emphasis on competitive athletics may exclude many children from participation.

In October 2002, the Centers for Disease Control and Prevention initiated a media campaign called "VERB™," a five-year effort to promote physical activity through research, media, partnership, and community efforts. VERB™ advertisements aimed at children portray physical activity as being "cool," fun, and socially appealing, while advertisements aimed at parents encourage them to engage in physical activity with their children and suggest ways to overcome barriers to physical activity.

This campaign also addresses environmental factors, such as access to safe and affordable opportunities for both leisure-time and organized physical activities. The outcomes of this media campaign will be measured three times by the Youth Media Campaign Longitudinal Survey, a telephone survey of children aged 9 to 13 and their parents. The baseline data from spring 2002 showed that most participants engage in some free-time physical activity, but increased participation rates in both free-time and organized physical activities are needed to curb the youth obesity epidemic. Data from the spring 2003 survey have not been published, and the last survey will be conducted in spring 2004. More information about the VERB™ campaign is available at [www.cdc.gov/verb](http://www.cdc.gov/verb).

### Healthy Eating Patterns

In conjunction with physical activity, proper eating habits developed during childhood and adolescence are important for growth and development, encouraging healthy eating habits throughout life. However, healthy eating behaviors are difficult to maintain as children get older, partly because snack foods high in sugar and fat are so plentiful.<sup>54,55</sup> Consumption of snack foods doubled in the last 20 years, and, in addition, American children are consuming more meals away from home, mainly at restaurants and fast-food places.<sup>55,56</sup> These developments are detrimental to healthy eating because foods eaten away from home are generally less nutritious and higher in fat and calories than food consumed at home.<sup>57</sup> Moreover, these trends may have contributed to the persistently low intake of vegetables and fruits seen among adolescents. Specifically, current data in Table 1B show that less than one-fourth (21.4%) of US high school students ate five or more vegetables and fruits per day.

To shift the trend toward more healthful diets among America's youth, both children and parents need to understand the impact of meals eaten away from home.<sup>56</sup> Current research shows that 30.3% of children and adolescents consume fast food on a typical day, which contributes to a less healthful overall diet.<sup>58</sup> Children who eat fast food consume more total calories, total fat, and added sugars, as well as more sugar-sweetened beverages, less milk, and fewer fruits and non-starchy vegetables.<sup>58</sup> Parents should limit their children's consumption of fast food and ensure that healthy food choices are available and accessible at home for meals and snacks.<sup>59</sup>

Schools can play an important role by implementing health promotional programs tailored for specific

groups since nutritional deficiencies vary by age and gender.<sup>55</sup> The United States Department of Agriculture has acted to improve school meals and to encourage more nutrition education in schools.<sup>56</sup> For a low-fat food program to attract adolescents, the foods must be tasty, available, and clearly labeled.<sup>60</sup> Advertisements for snacks, fast foods, and soft drinks during television programs commonly watched by children should be discouraged.<sup>61</sup>

Between 56% and 85% of school-age children consume at least one non-diet soft drink daily, thereby adding calories with no nutritive value to their diet.<sup>62</sup> Communities face difficult choices when, in times of tight budgets, soft drink manufacturers offer schools financial incentives in return for the sale and marketing of their soft drink products.<sup>61</sup> Some communities are making the right choice, however. For example, soft drink sales will be banned from all schools in the Los Angeles School District in 2004, and vending machines will be stocked with healthier options such as bottled water, milk, 100% fruit juice, and sports drinks that meet the requirements for sugar content.<sup>36</sup> In Gastonia, North Carolina, a school principal removed all soda and snack vending machines except two that dispense water.<sup>36</sup> Recently, the American Academy of Pediatrics released a new policy statement recommending that school districts consider restricting the sale of soft drinks to safeguard against health problems that result from overconsumption among children.<sup>62</sup> While soft drink sales can be a substantial source of income for school

districts, nutritious alternatives such as water, real fruit juices, and low-fat milk are available and can also help maintain school revenues.<sup>62</sup>

## Sun Protection

The vast majority of skin cancers are the result of unprotected and excessive ultraviolet (UV) radiation exposure.<sup>63</sup> The American Cancer Society estimates that UV exposure is associated with more than one million cases of basal and squamous cell cancers and 52,400 cases of malignant melanoma annually.<sup>1</sup> Artificial sources, such as tanning booths, contribute to UV exposure. While the short-term results of unprotected UV exposure are sunburn and tanning, long-term exposure can cause prematurely aged skin, wrinkles, and skin cancer. Though it was once believed that dark brown or black skin prevented melanoma, research has shown that darker-skinned people can develop this cancer, especially on the hands, soles of the feet, and under the nails.

Ways to protect the skin from sun damage include wearing protective clothing that adequately covers the arms,



## Risk Factors and Prevention Measures for Melanoma and Other Skin Cancers

### Risk factors for melanoma<sup>76</sup>

- Light skin color
- Family history of melanoma
- Personal history of melanoma
- Presence of moles and freckles
- History of severe sunburn occurring early in life

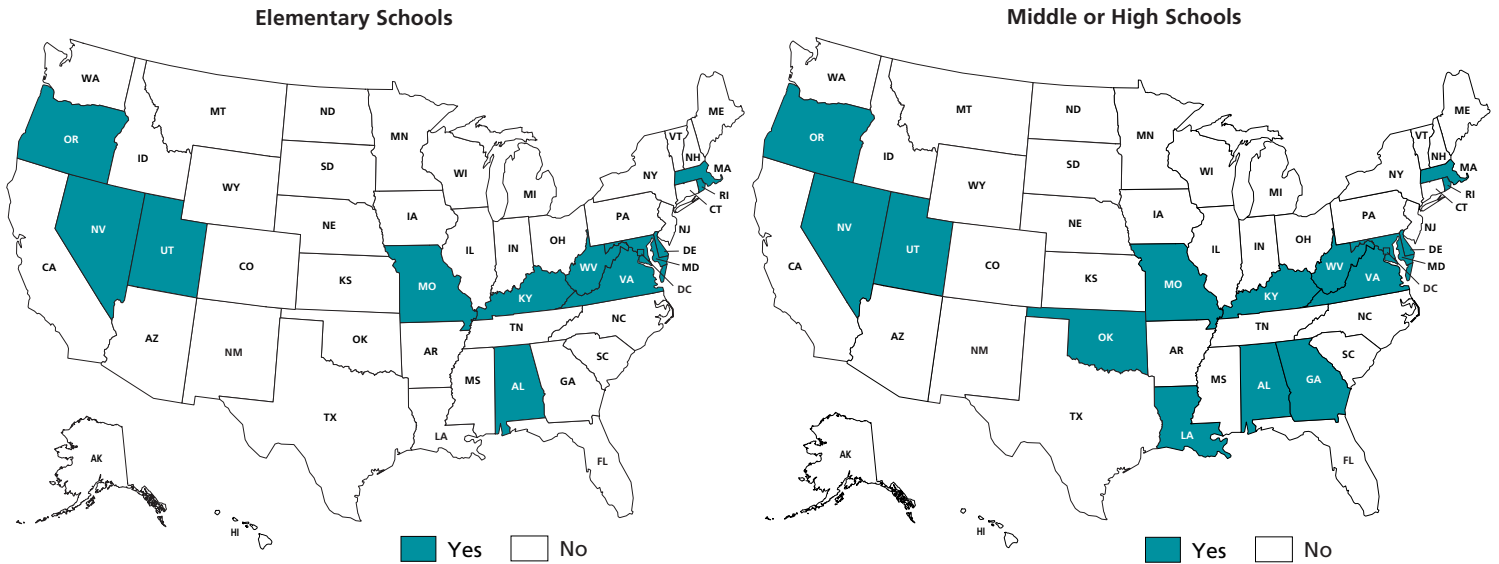
### Risk factors for basal and squamous cell cancers<sup>76</sup>

- Chronic exposure to the sun
- Family history of skin cancer
- Personal history of skin cancer
- Light skin color

### Measures to prevent skin cancer

- Avoid direct exposure to the sun between the hours of 10 a.m. to 4 p.m., when ultraviolet rays are the most intense.
- Wear hats with a brim wide enough to shade face, ears, and neck, as well as clothing that covers as much as possible of the arms, legs, and torso.
- Cover exposed skin with a sunscreen lotion with a sun protection factor (SPF) of 15 or higher.
- Avoid tanning beds and sun lamps, which provide an additional source of UV radiation.

**Figure 1F. Policies for Required Sun Safety or Skin Cancer Prevention in Schools, by State, 2000**



Source: School Health Policies and Programs Study, 2000, National Center for Chronic Disease Prevention and Health Promotion.<sup>19</sup>

trunk, and legs; wearing a hat that provides adequate shade to the whole head; seeking shade whenever possible; avoiding outdoor activities during periods of peak sunlight (10 a.m.-4 p.m.); and using a sunscreen with a sun protection factor (SPF) of 15 or higher. Practicing these sun protection behaviors regularly can lead to significant reductions in unprotected sun exposure and subsequent reduction in risk for skin cancer.

Sunburn during childhood and intense intermittent unprotected sun exposure increases the risk of melanoma and other skin cancers.<sup>64-66</sup> Because much exposure to sunlight occurs during childhood or adolescence, protection behaviors should begin early in life. A study by the Centers for Disease Control and Prevention revealed that 25% of parents did not require their children, age 12 or younger, to use sun protective behaviors, and the proportion of children who used one or more protective behaviors decreased with age.<sup>67</sup>

Adolescence is a period of heightened unprotected sun exposure.<sup>68</sup> An American Cancer Society study of youth aged 11 to 18<sup>69</sup> showed less than one-third used any sun protection measures such as wearing wide-brimmed hats, long-sleeved shirts, long pants, or sunscreen. Among those who used any sun protection, sunscreen was the most popular form, with more than one-half (58%) reporting use of sunscreen with an SPF of 15 or higher at the beach or pool. However, less than one-third (31%) used it if they were outdoors in the sun for more than one hour, but not at the beach or pool.<sup>69</sup>

Almost three-quarters (72%) of youth reported getting sunburned during the summer months. Of those, more than one-third (39%) reported using an SPF of 15 or higher sunscreen lotion when they got burned.<sup>70</sup> It is important that adolescents be educated about proper application and re-application intervals for sunscreen.<sup>71,72</sup>

While 10% of the youth aged 11 to 18 used tanning sunlamps in the past year, the percentages were greater for youth whose primary caregiver had also used a tanning sunlamp (29.5%).<sup>73</sup> The percentages were also greater for girls (15.6%), for youth aged 17 to 18 years old (25.7%), and those who did not use SPF of 15 or higher sunscreen at the beach or pool (15.6%).<sup>73</sup> The Youth Risk Behavior Surveillance System showed that, among private and public high school students, only 15% used sunscreen with an SPF of 15 or higher “most of the time” or “always” when they were outdoors in the sun for more than an hour.<sup>74</sup>

To improve sun protection practices among children and adolescents, recommendations have been made to develop comprehensive programs that include school intervention components.<sup>75</sup> However, policies for sun safety programs do not exist in the majority of elementary, junior/middle, or senior high schools in the US (Figure 1F). In states where UV exposure is high year-round, parents should advocate for sun protection programs at all grade levels and establish proper sun protection practices for their own children.

# Adult Cancer Prevention

Much of the cancer burden in the US could be prevented by reducing exposure to known risk factors. All of the cancers caused by cigarette smoking and heavy use of alcohol could be prevented completely. The American Cancer Society estimates that in 2004 more than 180,000 cancer deaths will be caused by tobacco use.<sup>1</sup> Moreover, scientific evidence suggests that approximately one-third of the estimated 563,700 cancer deaths expected to occur in 2004 will be related to poor nutrition, physical inactivity, overweight, obesity, and other lifestyle factors.<sup>1-3</sup> Most of the one million skin cancers that will be diagnosed in 2004 could have been prevented by protecting skin from the sun's rays or avoiding tanning booths.

Cancer screening reduces mortality from cancers of the breast, uterine cervix, colon, and rectum, and there are other cancers for which screening may lower mortality, but that evidence is less certain. Regular checkups by a health professional provide an opportunity for identifying signs of other cancers, such as of the testis, oral cavity, and skin, at early stages, as well as for discussions about testing for cancers in which shared decisions are appropriate (i.e., testing for prostate cancer). A heightened personal awareness of breast changes or skin changes may also result in detecting these tumors at earlier stages.

Increasingly, the impact of community and environmental factors on individual health behaviors is being recognized.<sup>17</sup> Physical activity, healthy nutrition, tobacco avoidance, and cancer screening can all be influenced through legislation, public health policies, and well-funded community efforts such as comprehensive tobacco control programs.<sup>77</sup>

Public policy and legislation at the federal, state, and local levels can also increase access to preventive health services, including cancer screening. For example, at the federal level, the American Cancer Society has advocated for increased funding of the Centers for Disease Control and Prevention's National Breast and Cervical Cancer Early Detection Program (NBCCEDP) to help low-income and uninsured women obtain screening. At both the state and federal levels, the American Cancer Society has advocated for laws requiring insurers to pay for a full range of colorectal cancer screening tests and to include, under Medicaid, treatment of breast and cervical cancer diagnosed through NBCCEDP. These, and

other community, policy, and legislative initiatives are highlighted below.

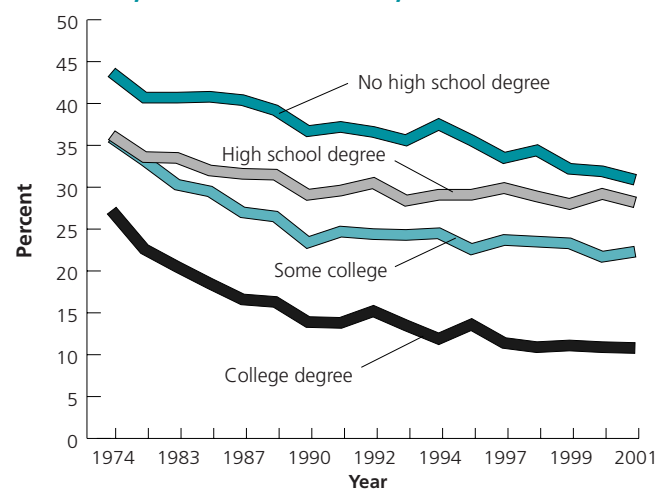
## Adult Tobacco Use

Tobacco use is the single largest preventable cause of disease and premature death in the United States. It accounted for an estimated 440,000 premature deaths and \$157.7 billion in health-related economic losses each year from 1995 to 1999.<sup>78</sup> Tobacco use causes increased risk of cancers of the lung, oral cavity, nasal cavities, larynx, pharynx, esophagus, stomach, liver, pancreas, kidney, bladder, and uterine cervix, as well as myeloid leukemia. Thirty percent of all cancer deaths, including 87% of lung cancer deaths, can be attributed to tobacco.<sup>2,79,80</sup>

Cigarette consumption and the national prevalence of smoking has declined since the release of the first US Surgeon General's Report on Smoking and Health in 1964.<sup>81</sup> Nonetheless, an estimated 25.2% of men and 20.7% of women still smoke cigarettes, with approximately 82% smoking on a daily basis.<sup>82</sup>

Smoking prevalence varies by level of education. Interestingly, this relationship has reversed over time. In the early 1960s, college-educated adults had the highest smoking prevalence. By 2001, only 10.8% of college graduates were current smokers, compared to 30.9% of those who did not graduate from high school (Figure 2A).<sup>83</sup> Smoking prevalence is higher among men than women, and it varies by race, ethnicity, and socioeconomic status

**Figure 2A. Current\* Cigarette Smoking by Education, Adults 25 and Older, 1974-2001**



\*Adults 25 and older who have smoked 100 cigarettes in their lifetime and who are current smokers (regular and irregular).

Source: National Health Interview Survey, 1974-2001, National Center for Health Statistics, Centers for Disease Control and Prevention.<sup>83</sup>

American Cancer Society, Surveillance Research

(Table 2A). The prevalence of smoking is highest among American Indian and Alaska Native men and women and lowest among Asian American men and women (Table 2A).<sup>82</sup> Among the states, prevalence of smoking ranges from 12.7% in Utah to 32.6% in Kentucky (Table 2B).

For the 46.2 million Americans who reported smoking cigarettes in 2001,<sup>82</sup> immediate efforts are needed to increase quitting, as well as efforts to help smokers stop smoking at an early age. Much of the risk of premature death from smoking could be prevented by cessation. Smokers who quit can expect to live longer than those who continue to smoke. The risk of dying from smoking-related cancers becomes progressively lower in smokers who quit early (before age 50), compared to those who continue to smoke or who delay quitting (Figure 2B).<sup>84</sup>

### Tobacco Control

Smokers who wish to quit can avail themselves of various effective treatments for tobacco dependence



(e.g., various nicotine replacement products alone or in combination with counseling and behavioral therapies).<sup>85</sup> Quitting is more difficult for some smokers than others, and the chances of success can be improved by effective treatment. Health care providers can play an especially important role by counseling and offering assistance to their patients who smoke, as well as by providing access to effective, affordable treatment.

Further reductions in tobacco use will require not only public health education, but also implementation of economic, policy, and regulatory interventions that are known to reduce tobacco use and protect nonsmokers from secondhand smoke.<sup>17</sup> The goals of comprehensive tobacco control are to:<sup>17</sup>

- Prevent the initiation of tobacco use among young people.
- Promote quitting among young people and adults.
- Eliminate nonsmokers' exposure to environmental tobacco smoke (ETS).
- Identify and eliminate the disparities in tobacco use and its effects among different population groups.

Best practices for comprehensive state tobacco control programs have been published.<sup>86</sup> Evidence that supports these recommendations stems in part from their success in two states, California and Massachusetts.<sup>17</sup> Legislation to increase state cigarette taxes and use a portion of the funds for comprehensive tobacco control was passed in California in 1988 and in Massachusetts in 1992.<sup>17</sup> Since the implementation of these programs, cigarette consumption per person has decreased more in these states than in the rest of the US as a whole (Figure 2C).

Excise taxes on tobacco serve the dual purpose of reducing tobacco consumption, especially among children, and of raising revenues to be used for tobacco control. The effect of cigarette price on consumption has been demonstrated in numerous studies, using a wide variety

**Table 2A. Current Cigarette Use\*, Adults 18 and Older, United States, 2001**

| Characteristic                     | % Men       | % Women     | % Total     |
|------------------------------------|-------------|-------------|-------------|
| <b>Age group (years)</b>           |             |             |             |
| 18 to 24                           | 30.4        | 23.4        | 26.9        |
| 25 to 44                           | 27.3        | 24.5        | 25.8        |
| 45 to 64                           | 26.4        | 21.4        | 23.8        |
| 65 or older                        | 11.5        | 9.2         | 10.1        |
| <b>Race/Ethnicity</b>              |             |             |             |
| White (non-Hispanic)               | 25.4        | 22.8        | 24.0        |
| African American (non-Hispanic)    | 27.7        | 17.9        | 22.3        |
| Hispanic                           | 21.6        | 11.9        | 16.7        |
| American Indian and Alaska Native† | 33.5        | 31.7        | 32.7        |
| Asian American‡                    | 18.5        | 6.3         | 12.4        |
| <b>Education (years)§</b>          |             |             |             |
| 8 or fewer                         | 24.2        | 13.4        | 18.6        |
| 9 to 11                            | 39.5        | 29.8        | 34.3        |
| 12                                 | 29.3        | 23.4        | 26.1        |
| 13 to 15                           | 26.6        | 22.1        | 24.2        |
| 16 or more                         | 13.3        | 11.2        | 12.3        |
| more than 16                       | 9.0         | 10.0        | 9.5         |
| <b>Total</b>                       | <b>25.2</b> | <b>20.7</b> | <b>22.8</b> |

\*Persons who reported having smoked at least 100 cigarettes or more and who reported now smoking every day or some days. †Estimates should be interpreted with caution because of the small sample sizes.

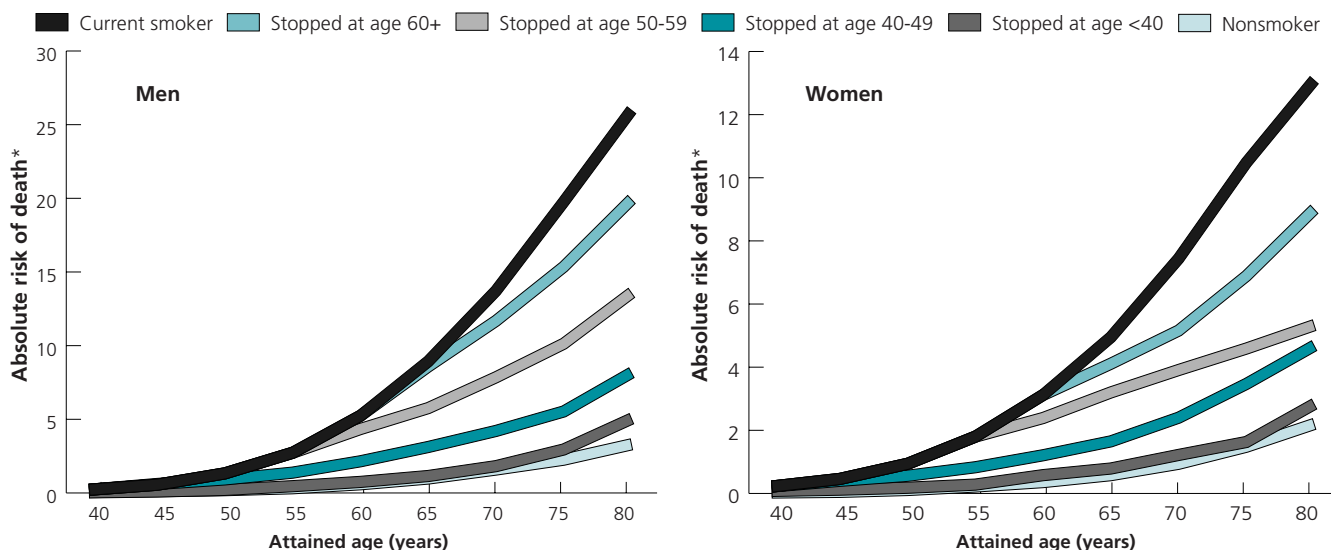
‡Does not include Native Hawaiians and other Pacific Islanders.

§Persons aged 25 or older.

**Source:** National Health Interview Survey, 2001, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention.<sup>82</sup>

American Cancer Society, Surveillance Research

**Figure 2B. Risk of Death from Smoking-related Cancers, Cancer Prevention Study II, Men and Women, 1984-1991**



\*Absolute risk of death is interpreted as a probability of dying from smoking-related cancers by a given age.

Source: Cancer Prevention Study II, American Cancer Society, unpublished data.

of data and methods. These studies predict that a 10% increase in price will reduce overall cigarette consumption by 3%-5%. States with higher excise taxes tend to have lower percentages of smokers.<sup>17</sup>

Smoke-free initiatives, such as banning smoking in public places, are another important component of comprehensive tobacco control. Such legislation reduces nonsmokers' exposure to environmental tobacco smoke, changes social norms about smoking, and may motivate addicted smokers to quit or reduce their smoking.<sup>17</sup>

Smoke-free initiatives exist at the federal, state, and local levels.<sup>17</sup> In 2003, 22 municipalities went smoke-free, bringing the total number of municipalities where local laws restrict smoking to more than 1,600.<sup>87</sup> However, not all smoke-free ordinances are created equal. Some laws provide broad exemptions, including times and places. The strongest ordinances are those requiring all workplaces, restaurants, and bars to be 100% smoke-free. More than 60 municipalities, in addition to Delaware and New York, meet this gold standard.

Figure 2D shows the number of local communities where smoke-free ordinances are considered to be strong and effective.<sup>88-90</sup> Florida, California, Connecticut, Utah, South Dakota, Vermont, as well as a few hundred municipalities, have all passed smoke-free laws.<sup>91</sup> This legislation restricts smoking either in workplaces, restaurants, bars, or some combination thereof. Recently, Lexington, Kentucky, a city in the heart of the

tobacco country, passed a smoke-free ordinance for bars. Other cities that have smoke-free ordinances include New York City; Boston, MA; Dallas, TX; and Albuquerque, NM. In some states, the tobacco industry has supported state laws that preempt local smoke-free initiatives.<sup>92</sup> These preemptions allow the tobacco industry to block grassroots action and are detrimental to public health.

In 2001, tobacco companies spent a record \$11.2 billion on tobacco advertising and promotions.<sup>12</sup> Comprehensive tobacco control programs use various strategies to counteract these messages, including media advocacy and paid advertisements designed to discourage tobacco use and expose the tobacco industry's marketing and promotional tactics.<sup>17</sup> In California, Massachusetts, Arizona, and Florida, mass media campaigns have been the most visible aspect of state tobacco control programs. In California, a statewide media campaign, which receives about 12% of its funds from tobacco state taxes, has been one of the program's most prominent elements. Considerable research has been done on how to design effective counter-advertising and health promotion campaigns.<sup>17</sup>

Tobacco cessation is a useful and cost-effective approach to prevent the disease consequences of smoking. However, payment for smoking cessation counseling and drug therapies to curb tobacco dependency is not consistently included in health insurance plans under Medicaid, private insurers, and managed



**Table 2B. Tobacco Use, Adults 18 and Older, 2002, and Comprehensive Tobacco Control Measures, by State, 2003, 2004**

|                   | Cigarette Smoking* |                    |                      |                  | Cigarette tax per pack (\$)‡ | Fiscal year 2004 per capita tobacco control funding (\$) | Fiscal year 2004 % of CDC's minimum annual recommendation (%) |
|-------------------|--------------------|--------------------|----------------------|------------------|------------------------------|--|---|
|                   | % 18 and older     | % Men 18 and older | % Women 18 and older | % Low education† |                              |  |   |
| Alabama           | 24.4               | 27.5               | 21.6                 | 31.6             | 0.165                        | 0.08   | 1.3   |
| Alaska            | 29.4               | 31.9               | 26.7                 | 44.9             | 1.00                         | 6.06   | 47.0  |
| Arizona           | 23.5               | 27.0               | 20.1                 | 36.4             | 1.18¶                        | 4.97   | 91.8  |
| Arkansas          | 26.3               | 28.7               | 24.1                 | 32.9             | 0.59#                        | 6.92   | 103.3   |
| California        | 16.4               | 19.6               | 13.3                 | 17.5             | 0.87                         | 2.66   | 54.6  |
| Colorado          | 20.4               | 21.4               | 19.4                 | 32.7             | 0.20                         | 0.88   | 15.5  |
| Connecticut       | 19.5               | 20.6               | 18.4                 | 27.5             | 1.51#                        | 0.15   | 2.4   |
| Delaware          | 24.7               | 25.4               | 24.1                 | 29.0             | 0.55#                        | 12.89  | 117.0   |
| Dist. of Columbia | 20.4               | 23.8               | 17.5                 | 32.2             | 1.00                         | 0.00   | 0.0   |
| Florida           | 22.1               | 23.6               | 20.7                 | 29.9             | 0.339                        | 0.06   | 1.3   |
| Georgia           | 23.3               | 26.8               | 20.0                 | 34.1             | 0.37#                        | 1.54   | 29.6  |
| Hawaii            | 21.1               | 26.2               | 16.0                 | 19.4             | 1.30¶                        | 7.35   | 82.6  |
| Idaho             | 20.6               | 21.6               | 19.7                 | 33.5             | 0.57#                        | 1.24   | 14.5  |
| Illinois          | 22.8               | 26.1               | 19.8                 | 29.1             | 0.98¶                        | 0.97   | 18.5  |
| Indiana           | 27.7               | 29.8               | 25.8                 | 42.4             | 0.555¶                       | 1.78   | 31.1  |
| Iowa              | 23.1               | 26.3               | 20.2                 | 33.2             | 0.36                         | 1.74   | 26.4  |
| Kansas            | 22.1               | 23.2               | 20.9                 | 32.8             | 0.79¶                        | 0.19   | 2.8   |
| Kentucky          | 32.6               | 34.8               | 30.5                 | 45.6             | 0.03                         | 0.64   | 10.4  |
| Louisiana         | 23.9               | 26.6               | 21.5                 | 32.5             | 0.36¶                        | 2.39   | 39.4  |
| Maine             | 23.6               | 26.4               | 21.1                 | 34.5             | 1.00                         | 11.37  | 129.6   |
| Maryland          | 22.0               | 25.7               | 18.6                 | 39.4             | 1.00¶                        | 2.79   | 48.8  |
| Massachusetts     | 19.0               | 20.2               | 18.0                 | 27.7             | 1.51¶                        | 0.39   | 7.1   |
| Michigan          | 24.2               | 25.1               | 23.5                 | 33.9             | 1.25¶                        | 0.00   | 0.0   |
| Minnesota         | 21.7               | 24.3               | 19.3                 | 35.1             | 0.48                         | 4.15   | 71.3  |
| Mississippi       | 27.4               | 33.2               | 22.2                 | 34.2             | 0.18                         | 7.03   | 106.4   |
| Missouri          | 26.6               | 29.6               | 23.9                 | 34.8             | 0.17                         | 0.00   | 0.0   |
| Montana           | 21.3               | 21.2               | 21.4                 | 38.0             | 0.70#                        | 3.55   | 34.2  |
| Nebraska          | 22.8               | 26.3               | 19.4                 | 27.0             | 0.64¶                        | 0.24   | 3.1   |
| Nevada            | 26.0               | 28.5               | 23.5                 | 27.7             | 0.80#                        | 2.15   | 31.9  |
| New Hampshire     | 23.2               | 23.9               | 22.6                 | 37.7             | 0.52                         | 0.00   | 0.0   |
| New Jersey        | 19.1               | 20.4               | 17.9                 | 26.5             | 2.05#                        | 1.25   | 23.3  |
| New Mexico        | 21.2               | 23.3               | 19.3                 | 28.5             | 0.91#                        | 2.75   | 36.5  |
| New York          | 22.4               | 25.9               | 19.2                 | 29.1             | 1.50¶                        | 1.95   | 38.6  |
| North Carolina    | 26.4               | 30.7               | 22.3                 | 30.6             | 0.05                         | 0.77   | 14.6  |
| North Dakota      | 21.5               | 23.1               | 20.0                 | 23.8             | 0.44                         | 4.67   | 36.8  |
| Ohio              | 26.6               | 28.4               | 25.0                 | 41.9             | 0.55¶                        | 3.35   | 61.5  |
| Oklahoma          | 26.7               | 29.7               | 23.8                 | 33.3             | 0.23                         | 0.72   | 11.5  |
| Oregon            | 22.4               | 24.6               | 20.2                 | 31.6             | 1.28¶                        | 0.85   | 13.5  |
| Pennsylvania      | 24.6               | 26.1               | 23.2                 | 34.3             | 1.00¶                        | 4.28   | 80.2  |
| Rhode Island      | 22.5               | 24.3               | 20.9                 | 29.4             | 1.71¶                        | 2.58   | 27.3  |
| South Carolina    | 26.6               | 29.1               | 24.4                 | 40.7             | 0.07                         | 0.00   | 0.0   |
| South Dakota      | 22.6               | 25.6               | 19.7                 | 29.7             | 0.53#                        | 0.99   | 8.6   |
| Tennessee         | 27.8               | 31.0               | 24.9                 | 38.0             | 0.20¶                        | 0.00   | 0.0   |
| Texas             | 22.9               | 26.8               | 19.1                 | 24.9             | 0.41                         | 0.35   | 7.2   |
| Utah              | 12.7               | 14.2               | 11.3                 | 38.6             | 0.695¶                       | 3.13   | 46.0  |
| Vermont           | 21.2               | 21.5               | 20.9                 | 35.8             | 1.19¶                        | 7.39   | 56.9  |
| Virginia          | 24.6               | 28.5               | 20.9                 | 34.4             | 0.025                        | 2.46   | 44.8  |
| Washington        | 21.5               | 23.6               | 19.4                 | 36.9             | 1.425¶                       | 4.45   | 78.6  |
| West Virginia     | 28.4               | 29.8               | 27.2                 | 34.2             | 0.55#                        | 3.26   | 41.7  |
| Wisconsin         | 23.3               | 25.4               | 21.4                 | 32.1             | 0.77                         | 1.86   | 32.1  |
| Wyoming           | 23.7               | 25.3               | 22.0                 | 38.8             | 0.60#                        | 6.08   | 40.7  |
| United States§    | 22.7               | 25.4               | 20.3                 | 29.7             | 0.42                         | 2.69   |   |
| Range             | 12.7-32.6          | 14.2-34.8          | 11.3-30.5            | 17.5-45.6        | 0.025-1.51                   | 0.33-19.16   | 0.0-136.2   |

\*Adults 18 and older who have smoked 100 cigarettes and are current smokers (regular and irregular). †Adults 25 and older with less than a high school education. ‡Taxes reported as of October 2003. §See Statistical Notes (p. 37) for definition of prevalence measures; average value (including District of Columbia) for taxes and per capita funding. ¶Passed tax increase legislation in 2002. #Passed tax increase legislation in 2003. N/A = Data not available.

**Source:** Cigarette smoking percentages: Behavioral Risk Factor Surveillance System Public Use Data Tape 2002, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2003. Cigarette Taxes: National Government Relations Department, American Cancer Society, 2003.<sup>95</sup> Per Capita Funding: calculated by dividing minimum recommended dollar amount<sup>93</sup> by 2000 US Census population count (<http://www.census.gov>). Percent Minimum Recommendation: A Broken Promise to Our Children. The 1998 Master Settlement Agreement Five Years Later, National Center for Tobacco-Free Kids, 2003.<sup>93</sup>

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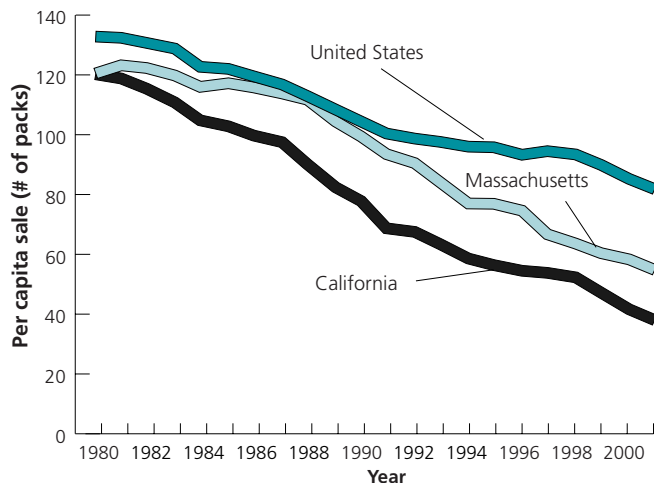


## When Smokers Quit

When smokers quit, their bodies show immediate and long-lasting improvements, including lower blood pressure and reduced risk of lung cancer. The American Cancer Society provides valuable resources that can help double a smoker's chances of quitting successfully.

care organizations, and it is not covered at all by Medicare.<sup>77</sup> Cost may be a barrier even among individuals who are insured because a significant portion of the cost is borne by the smoker through deductibles and copayments. In 2000, Medicaid programs covered one or more treatments for tobacco dependence in only 33 states and the District of Columbia; in 17 states, Medicaid covered no treatments at all.<sup>77</sup>

**Figure 2C. Trends in Per Capita Cigarette Consumption for Selected States and the Average Consumption Across All States, 1980-2001**



**Data from:** Orzechowski W, Walker RC. The tax burden on tobacco: historical compilation 2001: impact and opportunity, Volme 36. Arlington (VA): Orzechowski and Walker; 2001.

**Source:** Weir et al. Annual report to the nation on the status of cancer, 1975-2000, featuring the uses of surveillance data for cancer prevention and control, J Natl Cancer Inst 2003; 95:1276-1299. Reprinted by permission of Oxford University Press.

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**Figure 2D. Strong Local Smoke-free Ordinances\* in the United States, November 2003**



\*A strong smoke-free ordinance is defined as one that restricts smoking in workplaces, restaurants, bars, or some combination thereof, and has minimal exemptions, such as times or types of establishment.

**Note:** As of November 2003, there are 524 strong local smoke-free ordinances. There are more than 1,600 smoke-free ordinances in the US.

**Source:** American Nonsmokers' Rights Foundation, 2003.<sup>88-90</sup>

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Only one state, Oregon, offered coverage for all treatments recommended by the Public Health Service Clinical Practice Guidelines.<sup>77</sup> Although a growing number of health insurers and managed care organizations offer some treatment for smoking cessation, few provide full coverage for nicotine replacement and other cessation drugs, behavioral therapy, and counseling. Through the efforts of tobacco control advocates, four states (California, Colorado, New Jersey, and North Dakota) now mandate that private health insurers or managed care providers cover some smoking cessation therapies. Further, several states have developed programs to provide treatment to high-risk, low-income populations.<sup>77</sup>

### Funding for Tobacco Control

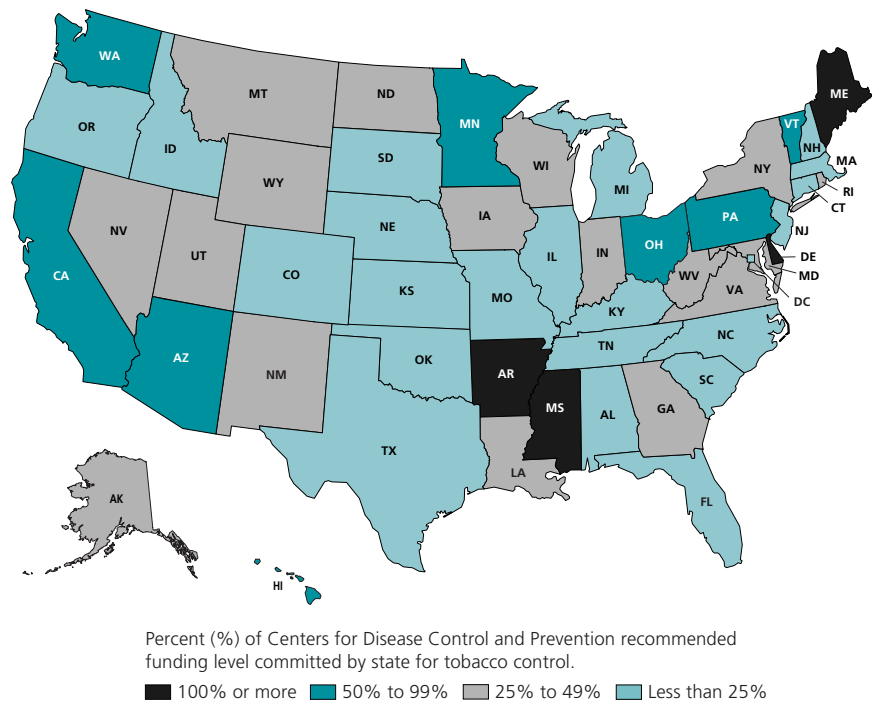
The Centers for Disease Control and Prevention has recommended base and per-capita levels of funding for states to address all components of comprehensive tobacco control.<sup>86</sup> These range from \$7 to \$20 per capita in smaller states (where population is less than three million), \$6 to \$17 per capita in medium-sized states (populations from three to seven million), and \$5 to \$16 per capita in larger states (populations more than seven million).<sup>86</sup> States collected a combined \$19.5 billion in revenue in 2003 from the Tobacco Master Settlement Agreement and tobacco taxes combined,<sup>93</sup> yet only four states met or exceeded the Centers for Disease Control

and Prevention's *Best Practices* minimum level for funding – Arkansas, Delaware, Maine, and Mississippi (Figure 2E).<sup>86</sup> Eight other states fund tobacco prevention programs at at least half the minimum levels recommended by the Centers for Disease Control and Prevention (Figure 2E). The remaining states fund at less than half the recommended amount.<sup>86,93</sup>

The American Cancer Society has joined with other leading health organizations to issue the Tobacco Tax Challenge that encourages governors to enact an above-average sales tax on cigarettes within their states.<sup>94</sup> Twelve states increased excise taxes in 2003, and 17 increased excise taxes in 2002 (Table 2B).<sup>95</sup> Further progress is needed, however, since only 22 states and the District of Columbia increased their tax to the targeted level (Figure 2F) and only 16 states have laws requiring that a portion of the excise tax be dedicated to tobacco control or cancer programs.<sup>94,96</sup>

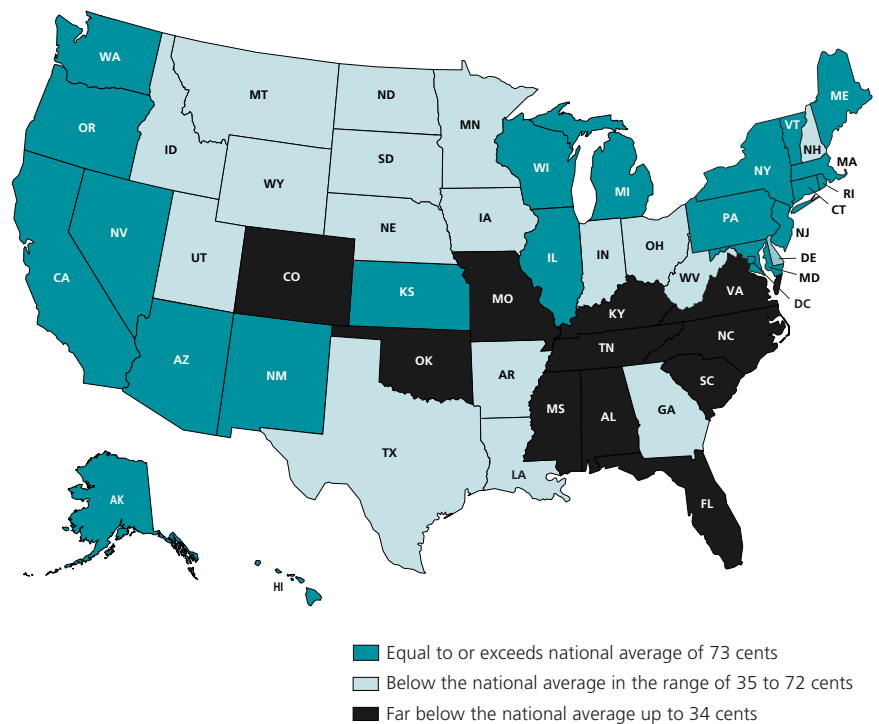
Money collected by states through the Master Settlement Agreement provides additional funding to support comprehensive tobacco control programs. However, in 2001, the average state received \$28.35 per capita from the tobacco settlement but allocated only 6% of these funds to tobacco control programs.<sup>97</sup> Only 48% of tobacco control settlement funds were spent on health care, long-term care, and medical research. The recent economic recession has tightened state budgets, increasing pressure on state legislatures to use tobacco settlement funds for general expenditures as an alternative to raising taxes or decreasing budgets.<sup>97</sup> Advocacy efforts are critical to maintaining and increasing the current allocation of tobacco settlement funds for tobacco control and other health programs. An encouraging example is Montana's 2002 Initiative 146 that required the state to spend half of its tobacco settlement funds on tobacco control and health care programs.

**Figure 2E. Funding for Tobacco Prevention, by State, 2004**



Source: National Center for Tobacco-Free Kids, 2003.<sup>93</sup>

**Figure 2F. Tobacco Excise Tax, by State, 2003\***



\*Data current as of October 2003.

Source: National Government Relations Department, American Cancer Society, 2003.

## Overweight and Obesity, Physical Inactivity, and Nutrition Among Adults

For the majority of Americans who do not use tobacco, improving their dietary choices and increasing physical activity are the most important strategies to reduce cancer risk. While individual choices are important factors in determining one's dietary and physical activity habits, such choices occur within a larger social context. Just as changes in the food supply, dietary practices, and activity levels in the population at large have resulted in an extraordinary increase in obesity over the past 30 years, major changes in the social environment are required to facilitate healthy behaviors.

The American Cancer Society published updated guidelines for nutrition and physical activity in 2002.<sup>59</sup> These guidelines include explicit recommendations on the essential role communities can play in facilitating healthy dietary choices and providing opportunities for physical activity in schools, worksites, and neighborhoods. (See below.) This section begins by discussing issues related to obesity and physical inactivity and then discusses broader dietary patterns.



Nutrition and physical activity are directly related to the risk of developing or dying from certain cancers. Physical activity decreases the risk of breast, colon, endometrial, and prostate cancers,<sup>72</sup> and consumption of diets high in vegetables and fruits is associated with lower risk of cancers of the mouth and pharynx, esophagus, lung, stomach, and colon and rectum.<sup>98</sup>

### American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention

#### Recommendations for Individuals

##### 1. Eat a variety of healthful foods, with an emphasis on plant sources.

- Eat five or more servings of a variety of vegetables and fruits each day.
- Choose whole grains in preference to processed (refined) grains and sugars.
- Limit consumption of red meats, especially high-fat and processed meats.
- Choose foods that help maintain a healthful weight.

##### 2. Adopt a physically active lifestyle.

- Adults should engage in at least moderate activity for 30 minutes or more on five or more days of the week; 45 minutes or more of moderate to vigorous activity on five or more days per week may further enhance reductions in the risk of breast and colon cancer.
- Children and adolescents should engage in at least 60 minutes per day of moderate to vigorous physical activity at least five days per week.

##### 3. Maintain a healthful weight throughout life.

- Balance caloric intake with physical activity.
- Lose weight if currently overweight or obese.

##### 4. If you drink alcoholic beverages, limit consumption.

#### Recommendation for Community Action

Public, private, and community organizations should work to create social and physical environments that support the adoption and maintenance of healthy nutrition and physical activity behaviors.

- Increase access to healthful foods in schools, worksites, and communities.
- Provide safe, enjoyable, and accessible environments for physical activity in schools and for transportation and recreation in communities.

## Obesity

Obesity is the nation's fastest growing health problem. The percentage of US adults who are obese increased by 75% between 1991 and 2001.<sup>99</sup> Currently, 64% of Americans are overweight, including 30% who are obese. Obesity increases the risk of developing or dying from many life-threatening diseases, including heart disease, type II diabetes, and many types of cancer.<sup>100,101</sup> About one-third of the cancer deaths that occur in the US each year are related to nutritional factors, physical inactivity, and excess weight.<sup>2,63</sup>

## Obesity and Cancer

The American Cancer Society was one of the first national organizations to call attention to the relationship between obesity and cancer mortality in a special section of *Cancer Facts & Figures 2000*.<sup>102</sup> In 2003, the American Cancer Society released the most comprehensive study to date on the relationship between excess body weight and cancer mortality, using data from the Cancer Prevention Study II.<sup>103</sup> Body mass index (BMI) was significantly associated with higher death rates from 11 types of cancer in men and 12 types of cancer in women (Figure 2G).<sup>103</sup> Based on the observed associations, the American Cancer Society study estimated that current patterns of overweight and obesity in the United States could account for up to 14% of all cancer deaths in men and up to 20% in women.<sup>103</sup>

## Prevalence of Overweight and Obesity

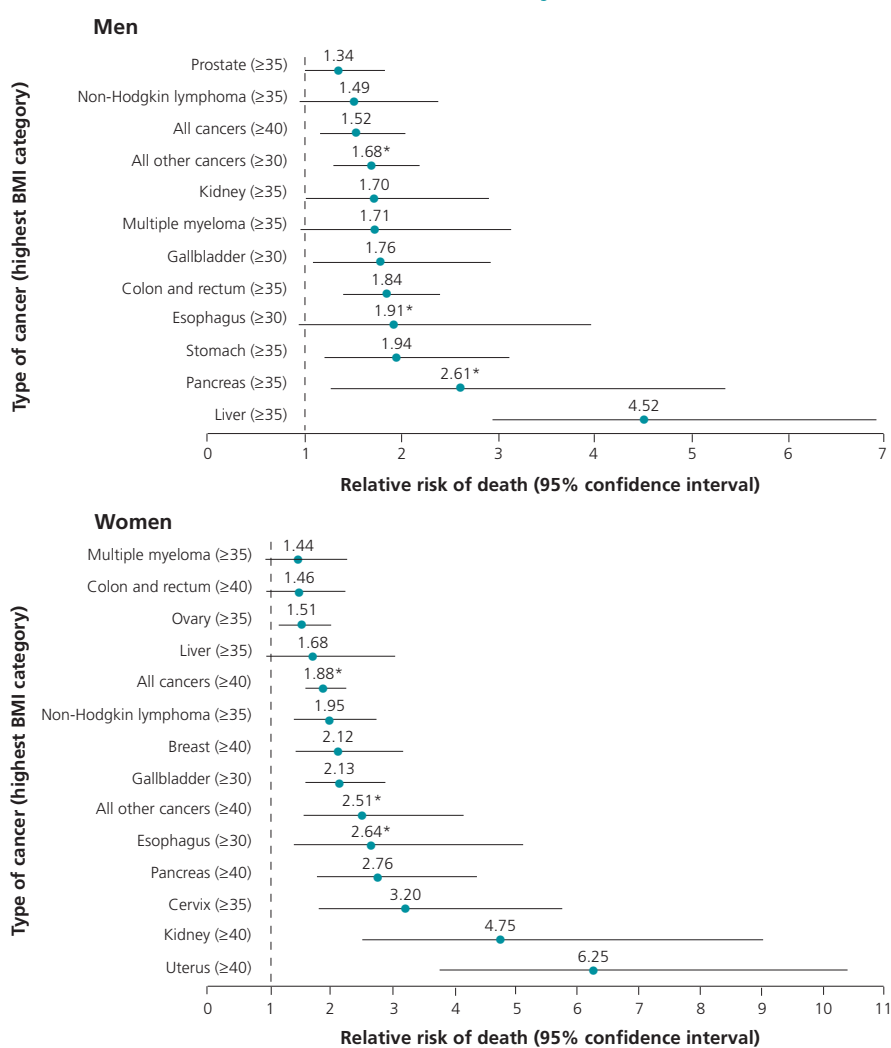
Obesity has reached epidemic proportions in the United States. The percentage of adults aged 20-74 who are obese (BMI greater or equal to 30 kg/m<sup>2</sup>) rose from 13.4% in 1960 to 20.9% in 2000, with the largest increases occurring in the 1990s.<sup>99</sup> Similar trends were observed among men and women (Figure 2H). An additional 33.6% of US

## What Is Relative Risk? What Is the Confidence Interval?

A *relative risk* compares the risk of disease among people with a particular exposure to the risk among people without that exposure. If the relative risk is above 1, then risk is higher among exposed than unexposed persons. If the relative risk is below 1, then risk is lower among exposed than unexposed persons. However, while relative risks are useful for comparisons, they do not provide information about the absolute amount of risk experienced by the exposed group.

A *confidence interval* is a statistical estimate of the range in which the true value is likely to fall. A 90% confidence interval is one that will contain the true value in 90 samples out of 100 surveyed. Similarly, a 95% confidence interval will contain the true value in 95 out of 100.

**Figure 2G. Cancer Mortality by Body Mass Index for United States Men and Women in the Cancer Prevention Study II, 1982-1998**



For each relative risk, the comparison was between men and women in the highest body mass index (BMI) category (indicated in parentheses) and men and women in the reference category (body mass index, 18.5 to 24.9). Asterisks indicate relative risks for men and women who never smoked. Results of the linear test for trend were significant ( $P \leq 0.05$ ) for all cancer sites.

**Source:** Calle EE et al. Overweight, obesity, and mortality from cancer in a prospectively studied cohort of US adults. *N Engl J Med* 2003;348:1625-1638 ©2003 Massachusetts Medical Society. All rights reserved.

## What Is Body Mass Index (BMI)? Who Is Overweight or Obese?

Different measures are used to determine whether a person is considered normal weight, overweight, or obese. A common scale is the body mass index (BMI), or ratio of weight (in kilograms) to height (in meters squared). While BMI is a reliable indicator of total body fat, it may overestimate body fat in athletes and others who have a muscular build, or underestimate body fat in older persons and others who have lost muscle mass.<sup>104</sup> For adults aged 20 and older, overweight is defined as a BMI of 25-29.9 kg/m<sup>2</sup>; obesity is defined as a BMI of 30 kg/m<sup>2</sup> or greater.

The table to the right relates BMI to pounds and inches rather than kilograms and meters. BMI corresponds to an individual's height (in the left column) and weight (in pounds). For example, a 5'4" woman is considered overweight if she weighs between 145 and 173 pounds. She is considered obese if she weighs 174 pounds or more. A 5'10" man is considered overweight if he weighs between 174 and 206 pounds and obese if he weighs 207 pounds or more.

| Height<br>(feet, inches) | Body weight (pounds) |        |
|--------------------------|----------------------|--------|
|                          | Overweight*          | Obese† |
| 6'4"                     | 205                  | 246    |
| 6'3"                     | 200                  | 240    |
| 6'2"                     | 194                  | 233    |
| 6'1"                     | 189                  | 227    |
| 6'0"                     | 184                  | 221    |
| 5'11"                    | 179                  | 215    |
| 5'10"                    | 174                  | 207    |
| 5'9"                     | 169                  | 203    |
| 5'8"                     | 164                  | 197    |
| 5'7"                     | 159                  | 191    |
| 5'6"                     | 155                  | 186    |
| 5'5"                     | 150                  | 180    |
| 5'4"                     | 145                  | 174    |
| 5'3"                     | 141                  | 169    |
| 5'2"                     | 136                  | 164    |
| 5'1"                     | 132                  | 158    |
| 5'0"                     | 128                  | 153    |
| 4'11"                    | 124                  | 148    |
| 4'10"                    | 119                  | 143    |

\*Overweight defined as BMI of 25 to 29.9 kg/m<sup>2</sup>.

†Obesity defined as BMI of 30 kg/m<sup>2</sup> or greater.

adults are overweight (BMI of 25.0 to 29.9 kg/m<sup>2</sup>).<sup>99</sup> The number of states in which at least half of adults are overweight or obese increased from 12 to 50 states, and the District of Columbia, in 2002 (Figure 2I). Table 2C shows the percentage of overweight and obese adults by states in 2002.

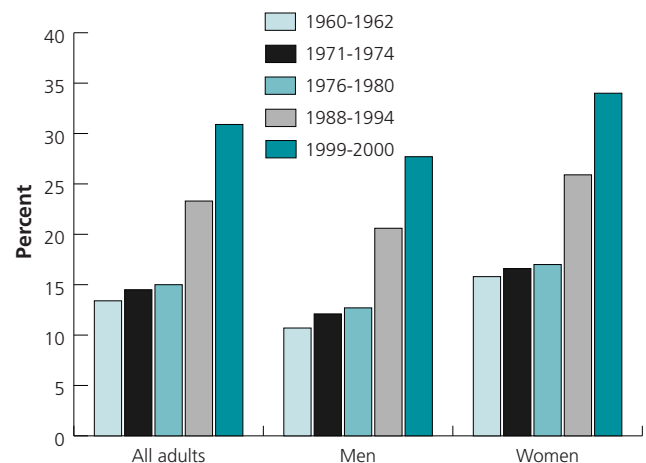
## Why Is Obesity Increasing?

The obesity epidemic is, in large part, a result of changes in the social environment that have increased caloric consumption and decreased energy expenditure in the population.<sup>105</sup> Individuals become overweight or obese because of a combination of excessive caloric intake and inadequate physical activity. For most Americans, both factors are important.

Many current conditions encourage chronic overeating, while multiple barriers reduce the opportunities for physical activity. Food in general is more readily available. Calorie-dense foods (in which fats and sugars make up much of the caloric content per unit serving) are less expensive and more aggressively marketed than healthy foods (such as vegetables and fruits). Large portion sizes are used to increase the sale of foods in restaurants and fast food places, and vending machines dispensing calorie-dense foods are ubiquitous at worksites, schools, and

hotels. Urban design increases reliance on cars and discourages walking, and opportunities for physical activity as part of daily life have been reduced or eliminated in most schools, workplaces, and communities.<sup>106</sup>

**Figure 2H. Adult Obesity\*, by Gender, Ages 20-74, 1960-2000**



\*Body mass index of 30 kg/m<sup>2</sup> or greater.

Source: National Health Examination Survey, 1960-1962, National Health and Nutrition Examination Survey, 1971-1974, 1976-1980, 1988-1994, 1999-2000, National Center for Health Statistics, Centers for Disease Control and Prevention.<sup>99</sup>

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**Table 2C. Overweight, Obesity, and Related Factors, Adults 18 and Older, by State, 2001 and 2002**

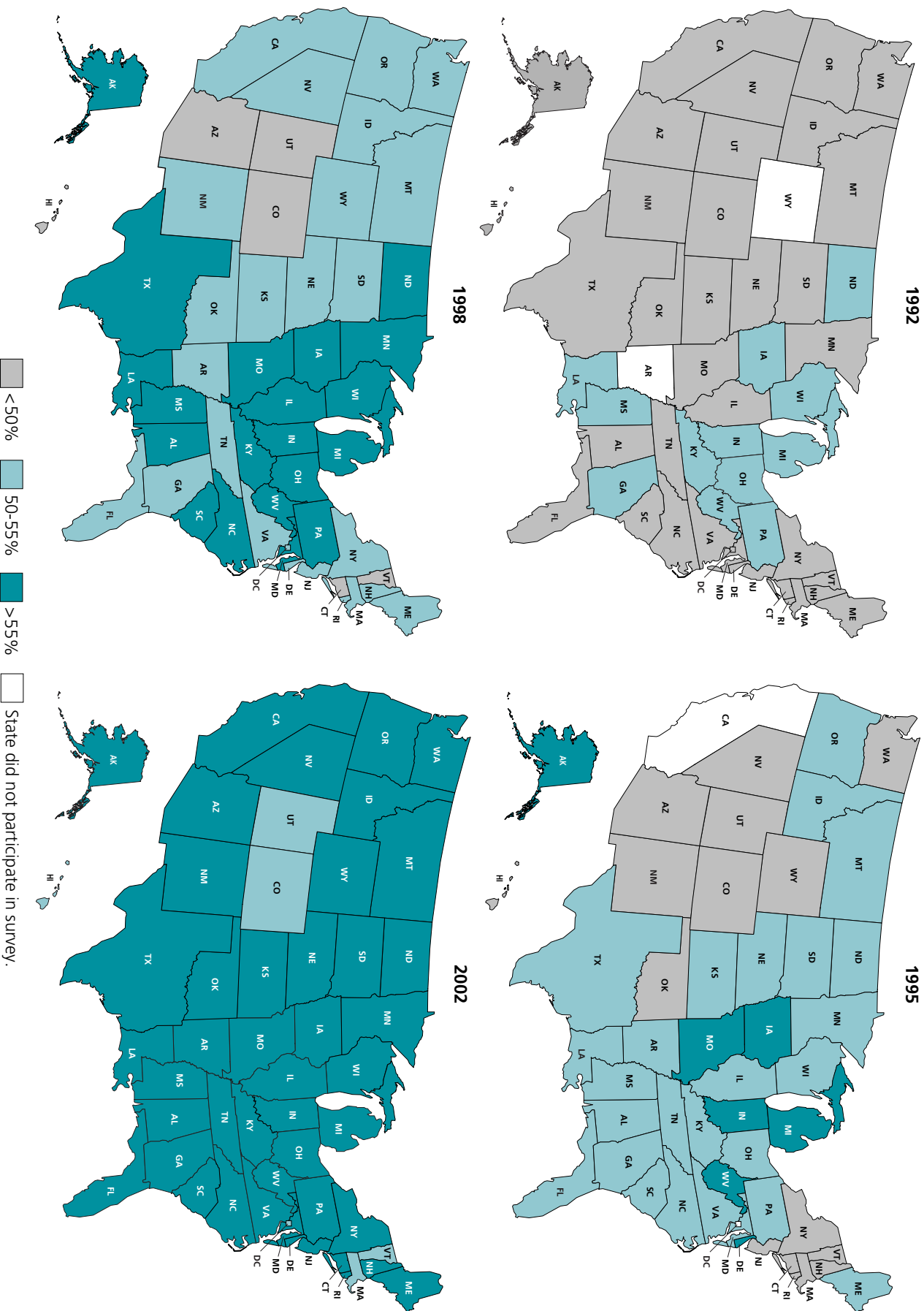
|                   | %<br>Clinically<br>overweight<br>(25-29.9<br>kg/m <sup>2</sup> ) | %<br>Clinically<br>obese<br>(30 kg/m <sup>2</sup><br>or greater) | %<br>Overweight<br>(25 kg/m <sup>2</sup><br>or greater) | %<br>No leisure-<br>time<br>physical<br>activity* | %<br>Vigorous<br>physical<br>activity*† | %<br>Moderate<br>physical<br>activity*‡ | %<br>Eating five<br>fruits and<br>vegetables<br>a day | %<br>Eating three<br>or more<br>vegetables<br>a day | %<br>Eating two<br>or more<br>fruits<br>a day |
|-------------------|--|--|---|---|---|---|---|---|---|
| Alabama           | 37.0   | 25.7   | 62.7  | 31.2  | 21.3                                    | 42.5                                    | 21.1  | 10.3  | 12.6  |
| Alaska            | 37.8   | 23.5   | 61.3  | 21.0  | 33.7                                    | 56.8                                    | 22.8  | 15.9  | 6.1   |
| Arizona           | 36.6   | 19.6   | 56.3  | 21.9  | 28.1                                    | 51.3                                    | 22.6  | 14.3  | 6.8   |
| Arkansas          | 37.2   | 23.8   | 61.0  | 31.5  | 23.7                                    | 45.2                                    | 20.7  | 10.9  | 12.2  |
| California        | 37.5   | 19.2   | 56.7  | 26.6  | 26.1                                    | 45.8                                    | 27.4  | 24.2  | 8.6   |
| Colorado          | 37.0   | 16.5   | 53.5  | 19.1  | 28.9                                    | 53.2                                    | 23.8  | 18.6  | 7.5   |
| Connecticut       | 37.0   | 18.2   | 55.2  | 24.0  | 27.6                                    | 48.3                                    | 30.5  | 18.9  | 8.0   |
| Delaware          | 36.3   | 22.5   | 58.7  | 25.7  | 21.3                                    | 41.6                                    | 19.4  | 7.1   | 9.0   |
| Dist. of Columbia | 32.3   | 20.8   | 53.1  | 24.2  | 27.0                                    | 50.0                                    | 33.6  | 19.0  | 12.2  |
| Florida           | 37.6   | 19.4   | 57.0  | 27.8  | 22.6                                    | 44.8                                    | 27.2  | 14.9  | 8.7   |
| Georgia           | 35.5   | 23.4   | 58.9  | 27.3  | 23.1                                    | 39.8                                    | 22.5  | 9.8   | 13.6  |
| Hawaii            | 36.0   | 17.2   | 53.2  | 19.0  | 26.4                                    | 50.2                                    | 20.3  | 8.7   | 4.9   |
| Idaho             | 37.0   | 20.3   | 57.3  | 21.1  | 29.7                                    | 54.5                                    | 21.7  | 15.0  | 6.6   |
| Illinois          | 37.3   | 22.0   | 59.2  | 26.5  | 25.2                                    | 45.9                                    | 21.0  | 12.9  | 6.4   |
| Indiana           | 37.2   | 24.2   | 61.3  | 26.3  | 24.9                                    | 46.0                                    | 21.7  | 15.1  | 8.1   |
| Iowa              | 38.3   | 22.9   | 61.2  | 25.9  | 19.5                                    | 43.6                                    | 19.8  | 13.3  | 6.2   |
| Kansas            | 37.5   | 22.8   | 60.3  | 26.7  | 23.5                                    | 44.1                                    | 18.3  | 7.2   | 6.6   |
| Kentucky          | 38.2   | 24.4   | 62.5  | 33.5  | 10.9                                    | 28.9                                    | 20.3  | 3.6   | 12.0  |
| Louisiana         | 35.7   | 25.5   | 61.2  | 35.6  | 17.9                                    | 35.5                                    | 17.2  | 6.2   | 10.9  |
| Maine             | 38.0   | 20.6   | 58.6  | 23.3  | 26.6                                    | 50.3                                    | 29.4  | 16.2  | 9.2   |
| Maryland          | 38.7   | 19.3   | 58.0  | 24.2  | 24.9                                    | 45.1                                    | 29.7  | 18.3  | 9.8   |
| Massachusetts     | 36.3   | 18.4   | 54.6  | 22.9  | 28.7                                    | 51.4                                    | 29.6  | 17.3  | 8.8   |
| Michigan          | 36.8   | 25.4   | 62.2  | 23.4  | 24.1                                    | 45.6                                    | 22.6  | 17.1  | 6.6   |
| Minnesota         | 36.5   | 22.4   | 58.9  | 17.1  | 24.5                                    | 48.7                                    | 22.7  | 18.3  | 5.4   |
| Mississippi       | 36.3   | 26.8   | 63.1  | 33.4  | 18.6                                    | 38.3                                    | 19.1  | 7.8   | 12.8  |
| Missouri          | 37.0   | 23.3   | 60.3  | 27.4  | 20.8                                    | 39.6                                    | 19.1  | 9.3   | 8.8   |
| Montana           | 37.9   | 18.8   | 56.7  | 21.9  | 24.1                                    | 51.1                                    | 22.6  | 15.4  | 6.3   |
| Nebraska          | 37.1   | 23.2   | 60.3  | 31.0  | 16.4                                    | 34.2                                    | 18.0  | 9.0   | 4.2   |
| Nevada            | 37.3   | 21.6   | 58.9  | 22.6  | 26.7                                    | 49.8                                    | 22.3  | 17.3  | 6.1   |
| New Hampshire     | 38.4   | 18.0   | 56.4  | 19.5  | 28.3                                    | 50.8                                    | 28.5  | 16.9  | 9.5   |
| New Jersey        | 37.2   | 19.1   | 56.3  | 26.5  | 22.7                                    | 43.9                                    | 28.0  | 15.2  | 7.1   |
| New Mexico        | 36.7   | 19.8   | 56.4  | 25.9  | 25.8                                    | 50.2                                    | 21.9  | 14.3  | 7.8   |
| New York          | 36.8   | 20.7   | 57.6  | 28.9  | 22.5                                    | 44.7                                    | 27.7  | 21.3  | 6.5   |
| North Carolina    | 35.3   | 23.6   | 59.0  | 26.4  | 20.5                                    | 42.4                                    | 23.6  | 8.1   | 15.0  |
| North Dakota      | 38.2   | 23.5   | 61.7  | 23.2  | 24.2                                    | 47.0                                    | 20.4  | 15.7  | 5.1   |
| Ohio              | 35.7   | 23.1   | 58.8  | 26.2  | 24.1                                    | 46.0                                    | 20.5  | 12.7  | 6.5   |
| Oklahoma          | 35.8   | 22.9   | 58.7  | 32.8  | 18.8                                    | 38.7                                    | 14.4  | 4.0   | 7.0   |
| Oregon            | 37.0   | 20.3   | 57.4  | 20.8  | 29.7                                    | 52.9                                    | 26.4  | 20.3  | 9.5   |
| Pennsylvania      | 35.7   | 24.0   | 59.6  | 24.6  | 24.5                                    | 46.2                                    | 25.3  | 19.3  | 7.0   |
| Rhode Island      | 37.7   | 18.4   | 56.2  | 24.8  | 24.6                                    | 48.4                                    | 28.5  | 17.1  | 7.5   |
| South Carolina    | 35.6   | 25.8   | 61.3  | 26.5  | 25.0                                    | 45.5                                    | 23.9  | 13.1  | 12.6  |
| South Dakota      | 39.4   | 21.2   | 60.6  | 25.3  | 20.8                                    | 44.2                                    | 20.7  | 12.1  | 4.3   |
| Tennessee         | 36.8   | 24.5   | 61.4  | 35.1  | 19.6                                    | 36.9                                    | 28.4  | 8.9   | 16.9  |
| Texas             | 37.4   | 25.4   | 62.8  | 27.1  | 23.4                                    | 43.3                                    | 23.9  | 16.7  | 10.4  |
| Utah              | 36.0   | 17.6   | 53.6  | 16.5  | 31.9                                    | 53.6                                    | 20.7  | 16.9  | 7.1   |
| Vermont           | 35.6   | 18.9   | 54.5  | 20.5  | 30.6                                    | 55.1                                    | 29.1  | 18.2  | 9.6   |
| Virginia          | 34.9   | 23.8   | 58.8  | 23.2  | 26.9                                    | 47.9                                    | 28.0  | 17.0  | 11.7  |
| Washington        | 37.7   | 21.3   | 58.9  | 17.1  | 29.8                                    | 55.4                                    | 23.8  | 18.5  | 8.9   |
| West Virginia     | 36.2   | 27.6   | 63.8  | 31.6  | 19.6                                    | 48.0                                    | 21.3  | 8.8   | 10.9  |
| Wisconsin         | 36.3   | 21.6   | 57.9  | 20.7  | 28.4                                    | 52.2                                    | 23.5  | 18.8  | 6.5   |
| Wyoming           | 36.5   | 19.6   | 56.0  | 21.3  | 30.5                                    | 56.0                                    | 22.1  | 14.4  | 6.1   |
| United States§    | 36.8   | 21.9   | 58.8  | 26.1  | 24.1                                    | 45.3                                    | 24.5  | 16.0  | 8.9   |
| Range             | 32.3-39.4  | 16.5-27.6  | 53.1-63.8   | 16.5-35.6   | 10.9-33.7                               | 28.9-56.8                               | 14.4-33.6   | 3.6-24.2  | 4.2-16.9                                      |

\*Data from 2001 Behavioral Risk Factor Surveillance System. †Any activity that caused large increases in breathing or heart rate at least 20 minutes three or more times per week (such as running, aerobics, or heavy yardwork). ‡Any activity that meets the criteria for vigorous physical activity (see previous definition) or activity that caused small increases in breathing or heart rate at least 30 minutes five or more times a week (such as brisk walking, bicycling, vacuuming, or gardening). §See Statistical Notes (p. 37) for definition.

**Source:** Overweight, obesity, fruit and vegetable percentages: Behavioral Risk Factor Surveillance System Public Use Data Tape 2002, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2003. Physical activity percentages: Behavioral Risk Factor Surveillance System Public Use Data Tape 2001, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2002.

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Figure 21. Overweight\* Adults in the United States, by State, 1992-2002

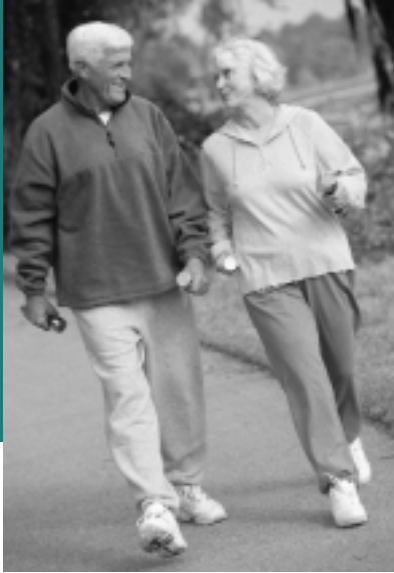


\*Body mass index of 25 kg/m<sup>2</sup> or greater.

Source: Behavioral Risk Factor Surveillance System, CD-ROM 1984-1995, 1998, and Public Use Data Tape 2002. National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 1997, 2000, 2003.

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### Prevalence and Trends in Physical Activity

The measure of physical activity that has been routinely tracked in population surveillance in the United States is leisure-time physical activity. This measure has changed little among US adults over the past decade. In 2000, 38% of US adults reported no leisure-time physical activity. About one-third (32%) participated in moderate physical activity and about one-quarter (23%) participated in vigorous physical activity.<sup>107</sup> Table 2C shows the percentage of people by state who report no leisure-time physical activity, moderate activity, or vigorous physical activity. In general, states with a high percentage of people reporting no leisure-time physical activity have a higher prevalence of overweight and obesity.

Leisure-time physical activity does not reflect physical activity at work. In 1990, the National Health Interview Survey asked respondents who worked outside the home about job-related physical activity. Approximately half (51.3%) of the employed respondents who reported no leisure-time physical activity reported at least one hour of hard occupational activity per day.<sup>108</sup>

In 2001, the Behavioral Risk Factor Surveillance System revised its physical activity questions to include leisure-time activities, household activities, and transportation-related physical activities; previous questionnaires included leisure-time activities only. As a result, the percentage of the population meeting recommended physical activity levels increased from 26.2% in 2000 to 45.4% in 2001. However, the percentage of adults reporting no leisure-time physical activity declined only slightly, from 27.4% in 2000 to 26% in 2001.<sup>109</sup> Guidelines for appropriate recommended levels of physical activity state that individuals should achieve at least 30 minutes or more of moderate physical activity on five or more days per week, or at least 20 minutes or more of vigorous physical activity on three or more days per week.<sup>110</sup>

### Moderate Physical Activity Examples\*

- Washing and waxing a car for 45-60 minutes
- Washing windows or floors for 45-60 minutes
- Playing volleyball for 45 minutes
- Playing touch football for 30-45 minutes
- Gardening for 30-45 minutes
- Wheeling self in wheelchair for 30-40 minutes
- Walking 1¾ miles in 35 minutes (20 minutes per mile)
- Basketball (shooting baskets) for 30 minutes
- Bicycling for 5 miles in 30 minutes
- Dancing fast (social) for 30 minutes
- Pushing a stroller 1½ miles in 30 minutes
- Raking leaves for 30 minutes
- Walking 2 miles in 30 minutes (15 minutes per mile)
- Water aerobics for 30 minutes
- Swimming laps for 20 minutes
- Wheelchair basketball for 20 minutes
- Basketball (playing a game) for 15-20 minutes
- Bicycling 4 miles in 15 minutes
- Jumping rope for 15 minutes
- Running 1½ miles in 15 minutes (10 minutes per mile)
- Shoveling snow for 15 minutes
- Stairwalking for 15 minutes

Less Vigorous,  
More Time



More Vigorous,  
Less Time

\*The amount of physical activity is influenced by its duration, intensity, and frequency. The same amount of activity can be obtained in longer sessions of moderately intense activities (such as brisk walking) as in shorter sessions of more strenuous activities (such as running).

**Adapted from:** Chronic Disease Notes & Reports, a publication of the Centers for Disease Control and Prevention.<sup>111</sup>

To achieve the American Cancer Society physical activity guidelines, adults may choose a variety of activities. Some examples from the table above include:

- Bicycle 5 miles in 30 minutes
- Walk 2 miles in 30 minutes and run 1½ miles in 15 minutes
- Garden for 30 minutes
- Play volleyball for 45 minutes

Data from other sources illustrate social changes that have contributed to reducing physical activity in US adults. The number of walking excursions decreased by 42% for the average American adult between 1975 and 1995.<sup>112</sup> More and more communities are structured for

automobile travel and do not provide sidewalks, stores, or schools within walking distance of homes. Physical activity has been engineered out of many aspects of daily life. Furthermore, there has been a shift in workplace activities from manual labor to white-collar jobs.<sup>112</sup> Therefore, communities and worksites must make special efforts to increase access to safe and convenient physical activity.

Examples of initiatives that encourage physical activity include:<sup>110,113</sup>

- Modifying the design of new residential communities to allow residents to walk or bike to shops, schools, and other services (mixed-use development)
- Investing in community design that supports development of sidewalks and bike lanes and access to parks and green space
- Developing worksite programs that encourage physical activity, especially for those with sedentary jobs
- Posting signs near stairs that encourage people to use them
- Encouraging social support interventions (i.e., social networks that support physical activity behavior change, such as setting up walking groups among friends)

### Vegetable and Fruit Consumption

The evidence that vegetable and fruit consumption may protect against cancer was reviewed in 2000 by the World Cancer Research Fund (WCRF) and found to be most conclusive for cancers of the mouth and pharynx, esophagus, lung, stomach, and colon and rectum.<sup>98</sup> The specific protective factors in vegetable and fruit consumption have not been identified with certainty, but it is possible that vegetable and fruit consumption may be a marker for some other associated dietary or lifestyle factor. The WCRF review concluded, however, that the evidence supported a broad recommendation for increasing vegetable and fruit consumption for reducing cancer risk.<sup>98</sup>

The national 5 A Day for Better Health Program was initiated in 1991 by the National Cancer Institute in collaboration with the American Cancer Society and other private organizations. This program seeks to increase the number of individuals who consume five to nine servings of vegetables and fruits daily. A recent evaluation showed that awareness of the 5 A Day program message has increased among adults.<sup>114</sup> This increase coincided with a slow but steady increase in vegetable

and fruit consumption from 1994 to 1998.<sup>114</sup> The 5 A Day program is continuing, with additional efforts to increase vegetable and fruit consumption among African American men.

Consumption of vegetables and fruits remains much lower than recommended levels. Only 24.5% of Americans surveyed in the 2002 Behavioral Risk Factor Surveillance System reported eating five or more servings of vegetables and fruits a day. This ranged from 14.4% in Oklahoma to 33.6% in the District of Columbia (Table 2C). The patterns were similar when consumption of vegetables and fruits was reported separately (Table 2C).

### Strategies to Prevent Obesity and Promote Healthy Lifestyles

A 2001 Surgeon General Report recognized the obesity epidemic as a serious public health problem and called for collaborative efforts, including government and private health organizations, the food industry, employers, the media, and communities, to address the issue. As a result, public health strategies should include both physical activity and nutrition components.<sup>6</sup>



One aspect of this coordinated response is research that will define the causes of the problem more precisely, identify interventions that will help people maintain a healthy body weight, and improve the treatment of obesity. For example, such research could include studies of factors that promote excessive caloric consumption, the barriers to behavioral change, the development of effective and cost-effective interventions, the measurement of health care and other costs from obesity, and the development of better treatments. Such research will take time. Approaches have been proposed to begin addressing the problem. (See sidebar.)

## Suggestions for Addressing Barriers to Improving Physical Activity and Nutrition

- Restrict advertising and marketing of foods and beverages of low nutritional values in schools.
- Encourage restaurants to provide nutrition information on menus (calories, fat, sugars, etc.).
- Invest in community designs that support development of sidewalks and bike lanes and access to parks and green space.
- Champion legislation mandating physical education requirements in K-12 schools.
- Launch large-scale marketing campaigns targeting consumers and decision makers to increase awareness of the lifestyle-cancer connection, and motivate people to take action to make their worksites, schools, and communities more “health friendly.”
- Disseminate information about communities that have developed successful programs to improve physical activity.
- Advocate for increases in Centers for Disease Control and Prevention appropriations so that all states can implement comprehensive nutrition and physical activity plans.
- Encourage collaboration between the government, nonprofit, and private sectors to develop research and intervention programs.
- Advocate for increased resources for governmental and nongovernmental organizations to facilitate a strategic action plan to address the obesity problem.

## Success Stories

This section highlights four communities with initiatives to improve nutrition and physical activity.

**The Seattle 5 A Day program.** This is a tested intervention designed for worksites to increase employees’ vegetable and fruit consumption using both environmental approaches (in the cafeteria and, more broadly, at work) and individual behavioral strategies. At the worksite, an employee advisory board develops activities to recruit employees for participation in the program. Examples of activities include messages to raise awareness about consumption of vegetables and fruits; skill-

building activities for employees; changes in the work-site cafeteria, including point-of-purchase displays; signs identifying foods as 5 A Day foods and spotlights on healthy eating; and, in some instances, incentives for eating more vegetables and fruits. Messages are delivered through posters, newsletters, table tents, and a self-help manual. An outcome evaluation study documented that the intervention produced both an increase in employee use of materials and activities and an increase in consumption of vegetables and fruits.<sup>116</sup>

**Body & Soul: A Celebration of Healthy Living.** This celebration of healthy living is a joint program of the American Cancer Society and the National Cancer Institute. The faith-based program was developed specifically to encourage African Americans to eat at least five servings of vegetables and fruits each day. The program includes pastor support and involvement, church activities, and policy and environmental changes within the church. A randomized effectiveness trial conducted among approximately 1,000 members from 15 African American churches across the US demonstrated that at the six-month follow up, participants reported increased vegetable and fruit consumption, as well as significant decreases in fat consumption.<sup>117</sup>

**Signs that encourage people to use the stairs.** A recent review of intervention studies to evaluate the effectiveness of signs placed by elevators and escalators showed that this intervention significantly increased the use of stairs where signs are posted. This intervention is versatile, showing effectiveness in a variety of settings, including railway, subway, and bus stations; shopping malls; and university libraries, and it works for a variety of population subgroups. In one study, obese people used the stairs more if the signs linked stair use to weight loss rather than to health benefits.<sup>110</sup>

**Nebraska Rural Trails.** A research study recently examined the impact of rural rail to trail conversions on small-town residents, business owners, and property owners. This research is the second part of the Nebraska Rural Trails Project, a multi-year research program designed to assist state and local trail managers and developers by documenting the impact of Nebraska’s developing trail system. One of the report’s findings is that trails may be contributing at least modestly to an increase in outdoor activity and physical activity levels among Nebraska residents.<sup>118</sup>

# Cancer Screening

Aside from tobacco avoidance and maintaining a healthy weight, following American Cancer Society recommendations for cancer screening is the most important thing people can do to reduce their chances of dying from cancer. Screening has been shown to reduce mortality from cancers of the breast, uterine cervix, and colon and rectum. There are other cancers for which screening may be associated with lower mortality, but the evidence is less certain. The American Cancer Society guidelines for early detection of cancer screening in people with no symptoms of cancer are shown on page 31.

## Breast Cancer Screening

Breast cancer screening has been shown to reduce breast cancer mortality.<sup>119</sup> Currently, 63% of breast cancers are diagnosed at a localized stage, for which the five-year survival rate is 97%. The high rates of early detection of breast cancer can be attributed to utilization of mammography screening as well as to high awareness of breast cancer symptoms in the population. However, African American, Hispanic/Latino, and American Indian and Alaska Native women are more likely to be diagnosed at regional and distant stages than whites and Asian American and Pacific Islander women.<sup>1</sup>

Breast cancer screening data is available from two different sources: the National Health Interview Survey (NHIS) and the Behavioral Risk Factor Surveillance System (BRFSS), both of which measure screening within the past year and the past two years. According to the NHIS, the percentage of women aged 40 and older who reported having had a mammogram within the past two years increased from 29% in 1987 to 70% in 2000.<sup>120</sup> While the difference between non-Hispanic white and African American women narrowed during that time, there was less progress in closing the gap for other racial and ethnic groups.<sup>120</sup> In 2000, the prevalence of mammography use in the past two years among women older than 40 was 70.3 %, while the prevalence of mammography use in the past year in US women was 55.3% (Table 3A). However, mammography use in the past two years was lower for African Americans (68.2%), Hispanics/Latinos (62.6%), American Indians and Alaska Natives (52.4%), and Asian Americans (57%) than among non-Hispanic whites. The lowest prevalence of mammography use in the past two years occurred among women who lack health insurance (39.5%) and immigrant women who have lived in the US for fewer than 10 years (41.4%) (Table 3A).

**Table 3A. Mammography, Women 40 and Older, United States, 2000**

| Characteristic                    | %<br>Mammogram<br>within the past<br>two years* | %<br>Mammogram<br>within the<br>past year* |
|-----------------------------------|---|--|
| <b>Race/Ethnicity</b>             |   |  |
| White (non-Hispanic)              | 72.1  | 56.9                                       |
| African American (non-Hispanic)   | 68.2  | 52.8                                       |
| Hispanic/Latino                   | 62.6  | 48.0                                       |
| American Indian and Alaska Native | 52.4  | 36.6                                       |
| Asian American†                   | 57.0  | 47.8                                       |
| <b>Education (years)</b>          |   |  |
| 11 or fewer                       | 56.8  | 41.7                                       |
| 12                                | 68.9  | 54.7                                       |
| 13 to 15                          | 73.3  | 58.2                                       |
| 16 or more                        | 80.1  | 65.1                                       |
| <b>Health insurance coverage</b>  |   |  |
| Yes                               | 73.6  | 58.3                                       |
| No                                | 39.5  | 27.9                                       |
| <b>Immigration</b>                |   |  |
| Born in US                        | 71.6  | 56.2                                       |
| In US fewer than 10 years         | 41.4  | 33.7                                       |
| In US 10 years or more            | 65.0  | 50.9                                       |
| <b>Total</b>                      | <b>70.3</b>                                     | <b>55.3</b>                                |

\*Percentages are age-adjusted to 2000 US standard population. See Statistical Notes (p. 36) for more information. †Does not include Native Hawaiians and other Pacific Islanders.

Source: National Health Interview Survey Public Use Data File 2000, National Center for Health Statistics, Centers for Disease Control and Prevention, 2002.

American Cancer Society, Surveillance Research



**Table 3B. Mammography and Clinical Breast Exam, Women 40 and Older, by State, 2002**

|                   | % Recent mammogram* |                |                    |                                  |                      | % Recent mammogram and clinical breast exam† |                |                    |                                  |                      |
|-------------------|---------------------|----------------|--------------------|----------------------------------|----------------------|--|----------------|--------------------|----------------------------------|----------------------|
|                   | 40 years and older  | 40 to 64 years | 65 years and older | No usual source of medical care‡ | No health insurance§ | 40 years and older                           | 40 to 64 years | 65 years and older | No usual source of medical care‡ | No health insurance§ |
| Alabama           | 65.3                | 64.9           | 66.4               | 40.4                             | 40.8                 | 57.1   | 58.9           | 53.3               | 35.1                             | 36.2                 |
| Alaska            | 53.9                | 51.3           | 66.8               | 28.0                             | 35.3                 | 50.6   | 48.9           | 59.7               | 26.2                             | 34.0                 |
| Arizona           | 63.8                | 60.1           | 71.2               | 36.8                             | 30.2                 | 56.4   | 56.0           | 57.0               | 27.6                             | 25.4                 |
| Arkansas          | 53.5                | 52.7           | 54.9               | 19.7                             | 30.9                 | 46.6   | 47.8           | 44.3               | 16.8                             | 28.0                 |
| California¶       | 60.7                | 59.1           | 64.6               | 35.7                             | 39.7                 | 48.5   | 49.7           | 45.8               | 28.4                             | 28.3                 |
| Colorado          | 59.8                | 59.4           | 61.0               | 32.8                             | 25.9                 | 53.4   | 55.3           | 47.9               | 21.8                             | 21.1                 |
| Connecticut       | 68.7                | 69.0           | 68.1               | 43.9                             | 46.8                 | 61.9   | 63.9           | 58.0               | 35.6                             | 41.9                 |
| Delaware          | 71.6                | 71.5           | 72.0               | 45.9                             | 39.8                 | 64.2   | 64.8           | 62.8               | 40.2                             | 35.3                 |
| Dist. of Columbia | 68.7                | 68.8           | 68.5               | 39.5                             | #                    | 61.9   | 63.7           | 58.4               | 37.5                             | #                    |
| Florida           | 66.7                | 65.1           | 69.5               | 44.2                             | 41.6                 | 60.0   | 60.3           | 59.5               | 40.3                             | 39.1                 |
| Georgia           | 59.9                | 59.4           | 61.4               | 30.3                             | 32.5                 | 53.3   | 54.0           | 51.5               | 26.9                             | 28.4                 |
| Hawaii            | 56.3                | 55.1           | 59.1               | 36.1                             | 26.7                 | 50.3   | 50.2           | 50.6               | 32.5                             | 24.8                 |
| Idaho             | 51.4                | 50.4           | 53.7               | 29.9                             | 27.8                 | 46.4   | 47.0           | 45.0               | 28.5                             | 25.0                 |
| Illinois          | 60.2                | 59.6           | 61.6               | 28.8                             | 37.8                 | 51.9   | 53.5           | 48.5               | 18.1                             | 28.1                 |
| Indiana           | 57.1                | 57.8           | 55.7               | 24.0                             | 36.3                 | 50.0   | 53.2           | 43.0               | 21.3                             | 32.5                 |
| Iowa              | 64.9                | 66.0           | 63.0               | 40.4                             | 38.9                 | 60.3   | 63.1           | 54.9               | 36.6                             | 35.0                 |
| Kansas            | 63.2                | 60.8           | 68.0               | 34.3                             | 29.7                 | 57.5   | 57.3           | 58.0               | 30.1                             | 29.0                 |
| Kentucky          | 61.7                | 61.8           | 61.5               | 40.9                             | 34.5                 | 57.2   | 58.1           | 55.2               | 36.4                             | 32.0                 |
| Louisiana         | 64.9                | 64.1           | 66.7               | 46.2                             | 43.6                 | 56.8   | 57.3           | 55.5               | 40.4                             | 38.0                 |
| Maine             | 67.4                | 65.7           | 70.9               | #                                | 37.3                 | 59.4   | 60.0           | 58.0               | #                                | 29.1                 |
| Maryland          | 67.1                | 67.4           | 66.3               | 33.0                             | 49.0                 | 61.2   | 62.3           | 58.4               | 27.2                             | 43.6                 |
| Massachusetts     | 70.2                | 70.2           | 70.2               | 34.5                             | 41.9                 | 64.3   | 64.8           | 63.2               | 31.2                             | 42.3                 |
| Michigan          | 61.8                | 60.4           | 65.1               | 34.0                             | 41.2                 | 54.8   | 55.5           | 53.2               | 29.9                             | 32.1                 |
| Minnesota         | 64.9                | 63.4           | 68.3               | 41.8                             | #                    | 59.9   | 59.6           | 60.7               | 37.8                             | #                    |
| Mississippi       | 52.9                | 52.0           | 54.8               | 31.5                             | 30.8                 | 46.8   | 47.3           | 45.6               | 26.7                             | 27.2                 |
| Missouri          | 59.0                | 58.8           | 59.3               | 25.8                             | 29.6                 | 51.5   | 54.3           | 45.5               | 17.9                             | 22.9                 |
| Montana           | 57.1                | 56.0           | 59.6               | 38.3                             | 23.2                 | 51.6   | 51.6           | 51.6               | 33.9                             | 21.1                 |
| Nebraska          | 59.5                | 61.1           | 56.5               | 25.9                             | 31.1                 | 55.4   | 58.5           | 49.4               | 20.2                             | 28.5                 |
| Nevada            | 57.7                | 55.9           | 62.6               | 33.6                             | 42.2                 | 47.0   | 46.7           | 47.7               | 26.5                             | 32.8                 |
| New Hampshire     | 66.7                | 66.8           | 66.4               | 31.1                             | 33.4                 | 60.7   | 61.8           | 58.1               | 28.8                             | 29.4                 |
| New Jersey        | 64.2                | 64.2           | 64.1               | 33.6                             | 45.2                 | 58.2   | 60.3           | 54.1               | 29.7                             | 39.4                 |
| New Mexico        | 51.3                | 50.0           | 54.8               | 26.2                             | 23.5                 | 46.1   | 45.7           | 47.1               | 22.7                             | 20.8                 |
| New York          | 63.7                | 63.0           | 65.1               | 35.0                             | 42.7                 | 55.2   | 55.9           | 53.6               | 30.4                             | 34.4                 |
| North Carolina    | 67.6                | 66.2           | 70.9               | 44.0                             | 44.2                 | 62.5   | 62.1           | 63.3               | 39.9                             | 40.2                 |
| North Dakota      | 61.8                | 60.1           | 64.8               | 33.7                             | 31.7                 | 55.5   | 56.3           | 53.9               | 30.3                             | 33.1                 |
| Ohio              | 61.7                | 60.2           | 64.8               | 42.4                             | 40.0                 | 54.8   | 55.5           | 53.4               | 39.3                             | 37.3                 |
| Oklahoma          | 54.9                | 54.7           | 55.4               | 31.5                             | 32.0                 | 47.8   | 49.3           | 44.6               | 24.1                             | 25.5                 |
| Oregon            | 57.8                | 54.4           | 65.7               | 27.1                             | 25.5                 | 49.6   | 48.7           | 51.7               | 24.2                             | 23.1                 |
| Pennsylvania      | 62.0                | 61.8           | 62.5               | 30.2                             | 38.0                 | 54.5   | 56.3           | 51.3               | 26.0                             | 33.3                 |
| Rhode Island      | 71.5                | 70.6           | 73.0               | 37.4                             | 57.3                 | 64.0   | 65.4           | 61.5               | 30.7                             | 47.3                 |
| South Carolina    | 58.3                | 55.5           | 64.9               | 33.2                             | 34.8                 | 51.0   | 49.8           | 53.7               | 28.1                             | 29.0                 |
| South Dakota      | 63.4                | 62.9           | 64.3               | 39.2                             | 48.8                 | 58.8   | 59.7           | 57.1               | 36.5                             | 45.7                 |
| Tennessee         | 63.9                | 64.1           | 63.3               | 29.3                             | 38.3                 | 58.7   | 60.5           | 54.7               | 23.0                             | 38.1                 |
| Texas             | 52.4                | 51.6           | 54.3               | 21.9                             | 28.1                 | 45.6   | 46.6           | 42.9               | 15.5                             | 24.2                 |
| Utah              | 51.1                | 51.1           | 51.0               | 28.2                             | 31.0                 | 43.7   | 46.3           | 36.9               | 19.3                             | 25.5                 |
| Vermont           | 62.8                | 61.0           | 67.1               | 32.9                             | 36.8                 | 57.0   | 57.1           | 56.8               | 30.3                             | 34.1                 |
| Virginia          | 59.1                | 57.8           | 62.3               | 33.0                             | 32.9                 | 51.8   | 51.7           | 52.0               | 27.2                             | 28.3                 |
| Washington        | 58.6                | 56.3           | 64.3               | 22.0                             | 34.1                 | 52.6   | 52.5           | 52.9               | 21.3                             | 31.9                 |
| West Virginia     | 60.5                | 61.9           | 57.9               | 39.9                             | 38.7                 | 52.1   | 55.3           | 45.8               | 35.1                             | 35.0                 |
| Wisconsin         | 64.5                | 63.5           | 66.8               | 24.6                             | 44.8                 | 57.8   | 58.2           | 57.1               | 22.3                             | 39.3                 |
| Wyoming           | 52.8                | 52.3           | 53.9               | 34.1                             | 32.2                 | 44.5   | 46.3           | 39.8               | 28.5                             | 30.3                 |
| United States**   | 61.5                | 60.5           | 63.8               | 33.7                             | 36.6                 | 54.1   | 54.9           | 52.3               | 28.3                             | 31.4                 |
| Range             | 51.1-71.6           | 50.0-71.5      | 51.0-73.0          | 19.7-46.2                        | 23.2-57.3            | 43.7-64.3                                    | 45.7-65.4      | 36.9-63.3          | 15.5-40.4                        | 20.8-47.3            |

\*A mammogram within the past year. †Both a mammogram and clinical breast exam within the past year. ‡Women 40 and older who reported that they did not have a personal doctor or health care provider. §Women aged 40 to 64 who reported they they did not have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare. ¶Questions for mammogram and clinical breast exam differed and may not be comparable to the state percentages in this table. #Sample size is insufficient to provide a stable estimate. \*\*See Statistical Notes (p. 37) for definition.

Source: Behavioral Risk Factor Surveillance System Public Use Data Tape 2002, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2003.

American Cancer Society, Surveillance Research

According to Behavioral Risk Factor Surveillance System data for states (Table 3B), the percentage of women 40 and older who reported having a mammogram in the last year (as recommended by the American Cancer Society) ranged from 51.1% in Utah to 71.6% in Delaware. For a recent mammogram and clinical breast exam performed by a health care professional, the percentages in 2002 were 3 to 12 percentage points lower than a recent mammogram alone and ranged from 43.7% in Utah to 64.3% in Massachusetts. Having a usual source of care is an indicator of access to preventive health care services and is related in part to health care coverage. In almost all states, women who lack a usual source of care or are uninsured have a much lower prevalence of breast cancer screening than the general population.

### Cervical Cancer Screening

Cervical cancer incidence and mortality rates have decreased markedly in the past several decades, with most of the reduction attributed to widespread use of the Pap test, which detects cervical cancer and pre-cancerous lesions.<sup>121</sup> Cervical cancer is one of the most successfully treatable cancers.<sup>121</sup>

In 1987, approximately three-quarters (73%) of women aged 25 and older had a Pap test within the past three years, and by 2000, the percentage had increased to 82%.<sup>120</sup> The lowest prevalence of cervical cancer screening occurred in women (aged 18 and older) with no health insurance (64.1%) and in recent immigrant women (59.3%). The prevalence of cervical cancer screening varied by race and ethnicity (Table 3C). Across the states surveyed by the Behavioral Risk Factor Surveillance System in 2002 (Table 3D), the recent Pap test percentage among women aged 18 and older ranged from 80.1% in Utah to 91.7% in Maryland.

### Programs to Increase the Rate of Breast and Cervical Cancer Screening

The Centers for Disease Control and Prevention's **National Breast and Cervical Cancer Early Detection Program** (NBCCEDP) helps low-income, uninsured, and medically underserved women gain access to screening exams for the early detection of breast and cervical cancers.<sup>122</sup> The program was established by the United States Congress in 1991. To date, the program has screened 1.75 million women and provided more than four million screening examinations, leading to the diagnosis of approximately 14,446 breast cancers, 55,210 pre-cancerous cervical lesions, and 1,020 cervical cancers. Despite its success, the Centers for Disease Control and Prevention estimates that the program is

**Table 3C. Pap Test\*, Women 18 and Older, United States, 2000**

| Characteristic                    | %†          |
|-----------------------------------|-------------|
| <b>Age (years)</b>                |             |
| 18-20                             | 59.9        |
| 21-29                             | 86.8        |
| 30-39                             | 89.8        |
| 40-49                             | 86.8        |
| 50-59                             | 87.8        |
| 60-64                             | 82.5        |
| 65-85                             | 68.4        |
| <b>Race/Ethnicity</b>             |             |
| White (non-Hispanic)              | 83.9        |
| African American (non-Hispanic)   | 85.5        |
| Hispanic/Latino                   | 77.9        |
| American Indian and Alaska Native | 78.4        |
| Asian American‡                   | 68.2        |
| <b>Education (years)§</b>         |             |
| 11 or fewer                       | 74.3        |
| 12                                | 82.5        |
| 13-15                             | 86.2        |
| 16 or more                        | 90.1        |
| <b>Health insurance coverage</b>  |             |
| Yes                               | 85.2        |
| No                                | 64.1        |
| <b>Immigration</b>                |             |
| Born in US                        | 84.1        |
| In US fewer than 10 years         | 59.3        |
| In US 10 years or more            | 79.2        |
| <b>Total</b>                      | <b>82.3</b> |

\*A Pap test within the past three years for women with intact uteri.  
 †Percentages are age-adjusted to 2000 US standard population. See Statistical Notes (p. 36) for more information. ‡Does not include Native Hawaiians and other Pacific Islanders. §Women aged 25 and older.

**Source:** National Health Interview Survey Public Use Data File, 2000, National Center for Health Statistics, Centers for Disease Control and Prevention, 2002.

American Cancer Society, Surveillance Research

currently only reaching approximately 15% of eligible women. The American Cancer Society continues to advocate for additional funding so that more women can benefit from this program. With the passage of the Breast and Cervical Cancer Prevention and Treatment Act, effective October 1, 2000, states have the option to provide medical assistance and follow-up treatment through the Medicaid program to eligible women who were screened in the NBCCEP. As of September 2003, 49 states and the District of Columbia had elected to provide this coverage.<sup>123</sup>

The **FoCaS Project**, one of many successful breast and cervical cancer screening interventions, was a four-year demonstration project designed to test interventions to increase rates of screening in low-income women. The project was conducted among residents of low-income housing communities in two North Carolina cities, one of which served as a control group.

**Table 3D. Pap Test, Women 18 and Older, by State, 2002**

|                   | % Recent Pap test* |                |                    |                                  |                      |
|-------------------|--------------------|----------------|--------------------|----------------------------------|----------------------|
|                   | 18 years and older | 18 to 64 years | 65 years and older | No usual source of medical care† | No health insurance‡ |
| Alabama           | 88.2               | 89.8           | 77.1               | 78.2                             | 81.0                 |
| Alaska            | 90.0               | 90.6           | 79.4               | 83.5                             | 79.5                 |
| Arizona           | 88.2               | 88.9           | 83.7               | 73.1                             | 76.6                 |
| Arkansas          | 83.0               | 86.0           | 64.3               | 62.1                             | 75.1                 |
| California§       | 84.4               | 84.6           | 82.3               | 71.4                             | 75.4                 |
| Colorado          | 88.7               | 90.3           | 73.9               | 79.4                             | 79.0                 |
| Connecticut       | 88.4               | 90.6           | 76.2               | 79.0                             | 77.4                 |
| Delaware          | 87.1               | 93.3           | 74.8               | ¶                                | ¶                    |
| Dist. of Columbia | 89.4               | 91.5           | 73.7               | 78.2                             | 85.1                 |
| Florida           | 86.0               | 88.0           | 77.0               | 75.9                             | 76.8                 |
| Georgia           | 89.3               | 91.0           | 70.3               | 76.3                             | 85.0                 |
| Hawaii            | 85.6               | 88.1           | 71.3               | 73.8                             | 70.9                 |
| Idaho             | 83.5               | 86.1           | 63.0               | 70.3                             | 73.6                 |
| Illinois          | 84.2               | 86.4           | 72.0               | 74.5                             | 76.8                 |
| Indiana           | 85.0               | 87.2           | 70.9               | 64.6                             | 73.7                 |
| Iowa              | 87.8               | 90.4           | 75.4               | 76.7                             | 77.8                 |
| Kansas            | 87.8               | 89.6           | 77.5               | 79.3                             | 83.2                 |
| Kentucky          | 84.3               | 85.4           | 76.4               | 73.5                             | 74.3                 |
| Louisiana         | 88.6               | 90.1           | 74.8               | 82.9                             | 83.1                 |
| Maine             | 91.5               | 93.4           | 80.7               | 72.3                             | 83.7                 |
| Maryland          | 91.7               | 93.9           | 76.4               | 79.9                             | 86.9                 |
| Massachusetts     | 88.1               | 90.6           | 73.4               | 70.5                             | 77.2                 |
| Michigan          | 87.6               | 89.4           | 75.3               | 78.7                             | 83.0                 |
| Minnesota         | 89.7               | 90.9           | 81.5               | 81.0                             | 78.0                 |
| Mississippi       | 83.9               | 86.9           | 61.2               | 79.3                             | 79.7                 |
| Missouri          | 84.2               | 87.8           | 65.3               | 67.1                             | 76.4                 |
| Montana           | 84.8               | 85.7           | 78.7               | 73.0                             | 74.5                 |
| Nebraska          | 86.3               | 88.9           | 71.7               | 81.1                             | 84.5                 |
| Nevada            | 82.9               | 84.9           | 66.7               | 72.2                             | 77.1                 |
| New Hampshire     | 90.2               | 92.0           | 78.3               | 76.0                             | 84.2                 |
| New Jersey        | 85.3               | 88.1           | 70.5               | 70.3                             | 74.1                 |
| New Mexico        | 84.0               | 86.2           | 68.0               | 73.3                             | 74.1                 |
| New York          | 84.8               | 87.0           | 72.4               | 70.0                             | 67.3                 |
| North Carolina    | 89.9               | 91.6           | 79.5               | 78.0                             | 84.4                 |
| North Dakota      | 86.6               | 88.1           | 78.8               | 79.5                             | 69.0                 |
| Ohio              | 86.4               | 88.5           | 73.8               | 73.7                             | 75.2                 |
| Oklahoma          | 83.0               | 85.4           | 64.9               | 69.8                             | 76.6                 |
| Oregon            | 85.5               | 87.2           | 72.9               | 77.2                             | 77.4                 |
| Pennsylvania      | 85.1               | 88.4           | 68.5               | 72.5                             | 77.9                 |
| Rhode Island      | 89.8               | 92.5           | 74.7               | 73.0                             | 78.5                 |
| South Carolina    | 87.9               | 88.0           | 87.5               | 75.0                             | 78.5                 |
| South Dakota      | 86.3               | 89.1           | 71.8               | 78.2                             | 81.9                 |
| Tennessee         | 88.7               | 91.2           | 71.2               | 83.6                             | 87.6                 |
| Texas             | 83.7               | 85.2           | 70.1               | 71.8                             | 78.3                 |
| Utah              | 80.1               | 81.6           | 61.5               | 69.3                             | 65.4                 |
| Vermont           | 89.1               | 91.2           | 76.5               | 77.8                             | 79.5                 |
| Virginia          | 89.2               | 90.4           | 79.7               | 76.8                             | 76.4                 |
| Washington        | 87.1               | 88.5           | 76.2               | 71.7                             | 76.1                 |
| West Virginia     | 85.2               | 88.8           | 67.5               | 78.0                             | 82.2                 |
| Wisconsin         | 87.9               | 90.1           | 74.6               | 71.1                             | 71.5                 |
| Wyoming           | 84.7               | 87.0           | 67.8               | 72.9                             | 77.8                 |
| United States#    | 86.2               | 88.0           | 74.4               | 73.8                             | 77.3                 |
| Range             | 80.1-91.7          | 81.6-93.9      | 61.2-87.5          | 62.1-83.6                        | 65.4-87.6            |

\*A Pap test within the preceding three years for women with intact uteri. †Women 18 and older who reported that they did not have a personal doctor or health care provider. ‡Women aged 18 to 64 who reported that they did not have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare. §Questions for Pap test differed and may not be comparable to the state percentages in this table. ¶Sample size is insufficient to provide a stable estimate. #See Statistical Notes (p. 37) for definition.

**Source:** Behavioral Risk Factor Surveillance System Public Use Data Tape 2002, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2003.

American Cancer Society, Surveillance Research

Public health clinics in the intervention city encouraged screening by chart reminders, exam room prompts, and staff and patient education. Community outreach strategies include educational sessions and literature distribution at community events and church activities. In the intervention city, the proportion of women receiving mammography within the last two years increased from 31% to 56%, and the proportion of women receiving a Pap test within the last three years increased from 73% to 87%. No change in screening rates was observed in the control city.<sup>124</sup>

## Colon and Rectum Cancer Screening

Colorectal cancer screening reduces death from colorectal cancer. It can also prevent the development of colon cancer by identifying and removing adenomatous polyps, from which colon cancers often develop. Several available screening options (i.e., the fecal occult blood home-test kit – FOBT – and endoscopy procedures such as the flexible sigmoidoscopy or colonoscopy) and radiological imaging with double-contrast barium enema can be effective in detecting the disease.<sup>125,126</sup>

Early diagnosis and treatment of colorectal cancer results in a survival rate of greater than 90%. Despite the availability of different screening methods, colorectal cancer screening is not widely used. From 1987 to 2000, the use of a recommended colorectal cancer screening method (either a fecal occult blood test within the last year or a colorectal endoscopic procedure within the last three years) among US adults aged 50 and older increased by 12% (from 27% in 1987 to 39% in 2000), based on National Health Interview Survey data.<sup>120</sup> It is clear that major efforts will be necessary to achieve the American Cancer Society's 2015 objective for 75% of people over 50 to be screened regularly.

Colorectal cancer screening rates among US adults aged 50 and older in the year 2000 varied by gender, race, education, health insurance coverage, and immigration status, but were lowest among those without health insurance (13% for FOBT within the past year and 14.4% for endoscopy within the past five years), among those with less than a high school education (12.1% for FOBT and 22% for endoscopy), among Hispanics/Latinos (9.8% for FOBT), among Asian Americans (19.2% for endoscopy), and among recent immigrants (3.3% for FOBT and 14.3% for endoscopy) (Table 3E). Recent Behavioral Risk Factor Surveillance System data showed little increase in colorectal cancer screening from 1997 to 2001.<sup>127</sup> An American Cancer Society study found that socioeconomic factors such as low educational attainment, lack of health insurance, or lack of access to a

**Table 3E. Colon and Rectum Cancer Screening, Adults 50 and Older, United States, 2000**

| Characteristic                     | Fecal occult blood test*<br>%‡ | Endoscopy†<br>%‡ |
|------------------------------------|--------------------------------|------------------|
| <b>Gender</b>                      |                                |                  |
| Male                               | 17.1                           | 33.5             |
| Female                             | 17.6                           | 27.0             |
| <b>Race/Ethnicity</b>              |                                |                  |
| White (non-Hispanic)               | 18.3                           | 31.3             |
| African American (non-Hispanic)    | 14.9                           | 27.0             |
| Hispanic/Latino                    | 9.8                            | 21.8             |
| American Indian and Alaska Native§ | 14.0                           | 25.2             |
| Asian American¶                    | 14.5                           | 19.2             |
| <b>Education (years)</b>           |                                |                  |
| 11 or fewer                        | 12.1                           | 22.0             |
| 12                                 | 16.4                           | 28.1             |
| 13 to 15                           | 19.4                           | 31.9             |
| 16 or more                         | 23.0                           | 40.4             |
| <b>Health insurance coverage</b>   |                                |                  |
| Yes                                | 17.9                           | 31.0             |
| No                                 | 13.0                           | 14.4             |
| <b>Immigration</b>                 |                                |                  |
| Born in US                         | 18.1                           | 30.9             |
| In US fewer than 10 years          | 3.3                            | 14.3             |
| In US 10 years or more             | 12.7                           | 23.8             |
| <b>Total</b>                       | <b>17.3</b>                    | <b>30.0</b>      |

\*A fecal occult blood test within the past year. †An endoscopy (tests include sigmoidoscopy, colonoscopy, or proctoscopy) within the past five years. ‡Percentages are age-adjusted to the 2000 US standard population. See Statistical Notes (p. 36) for more information. §Estimates should be interpreted with caution because of the small sample sizes. ¶Does not include Native Hawaiians and other Pacific Islanders.

**Source:** National Health Interview Survey Public Use Data File, 2000, National Center for Health Statistics, Centers for Disease Control and Prevention, 2002.

American Cancer Society, Surveillance Research

usual source of care were associated with under utilization of colorectal cancer screening.<sup>128</sup>

The recent fecal occult blood test percentages in 2002 for adults aged 50 and older ranged from 12.2% in Utah to 33.4% in Maine according to the Behavioral Risk Factor Surveillance System (Table 3F). The recent sigmoidoscopy or colonoscopy percentages in 2002 for adults 50 and older ranged from 30.1% in Wyoming to 54.9% in Minnesota. In general, adults aged 65 and older were more likely to have had a colorectal cancer screening test compared to those between the ages of 50 and 64. The prevalence of colorectal cancer screening was even lower for adults 50 and older who lack a usual source of care or who are uninsured.

States have recently begun to address the problem of under utilization of colorectal cancer screening by passing legislation to ensure that private health insurance plans cover screening methods available for colorectal



# Screening Guidelines

## For the Early Detection of Cancer in Asymptomatic People

| Site                          | Recommendation   |
|-------------------------------|--|
| <b>Breast</b>                 | <ul style="list-style-type: none"><li>• Yearly mammograms are recommended starting at age 40. The age at which screening should be stopped should be individualized by considering the potential risks and benefits of screening in the context of overall health status and longevity.</li><li>• Clinical breast exam should be part of a periodic health exam, about every three years for women in their 20s and 30s, and every year for women 40 and older.</li><li>• Women should know how their breasts normally feel and report any breast change promptly to their health care providers. Breast self-exam is an option for women starting in their 20s.</li><li>• Women at increased risk (e.g., family history, genetic tendency, past breast cancer) should talk with their doctors about the benefits and limitations of starting mammography screening earlier, having additional tests (i.e., breast ultrasound and MRI), or having more frequent exams.</li></ul>   |
| <b>Colon &amp; rectum</b>     | <p>Beginning at age 50, men and women should follow one of the examination schedules below:</p> <ul style="list-style-type: none"><li>• A fecal occult blood test (FOBT) or fecal immunochemical test (FIT) every year</li><li>• A flexible sigmoidoscopy (FSIG) every five years</li><li>• Annual FOBT or FIT and flexible sigmoidoscopy every five years*</li><li>• A double-contrast barium enema every five years</li><li>• A colonoscopy every 10 years</li></ul> <p><i>*Combined testing is preferred over either annual FOBT or FIT, or FSIG every five years, alone. People who are at moderate or high risk for colorectal cancer should talk with a doctor about a different testing schedule.</i></p>   |
| <b>Prostate</b>               | <p>The PSA test and the digital rectal examination should be offered annually, beginning at age 50, to men who have a life expectancy of at least 10 years. Men at high risk (African American men and men with a strong family history of one or more first-degree relatives diagnosed with prostate cancer at an early age) should begin testing at age 45. For both men at average risk and high risk, information should be provided about what is known and what is uncertain about the benefits and limitations of early detection and treatment of prostate cancer so that they can make an informed decision about testing.</p>  |
| <b>Uterus</b>                 | <p><b>Cervix:</b> Screening should begin approximately three years after a woman begins having vaginal intercourse, but no later than 21 years of age. Screening should be done every year with regular Pap tests or every two years using liquid-based tests. At or after age 30, women who have had three normal test results in a row may get screened every two to three years. Alternatively, cervical cancer screening with HPV DNA testing and conventional or liquid-based cytology could be performed every three years. However, doctors may suggest a woman get screened more often if she has certain risk factors, such as HIV infection or a weak immune system. Women 70 years and older who have had three or more consecutive normal Pap tests in the last 10 years may choose to stop cervical cancer screening. Screening after total hysterectomy (with removal of the cervix) is not necessary unless the surgery was done as a treatment for cervical cancer.</p> <p><b>Endometrium:</b> The American Cancer Society recommends that at the time of menopause all women should be informed about the risks and symptoms of endometrial cancer, and strongly encouraged to report any unexpected bleeding or spotting to their physicians. Annual screening for endometrial cancer with endometrial biopsy beginning at age 35 should be offered to women with or at risk for hereditary nonpolyposis colon cancer (HNPCC).</p> |
| <b>Cancer-related checkup</b> | <p>For individuals undergoing periodic health examinations, a cancer-related checkup should include health counseling, and depending on a person's age and gender, might include examinations for cancers of the thyroid, oral cavity, skin, lymph nodes, testes, and ovaries, as well as for some nonmalignant diseases.</p>  |

American Cancer Society guidelines for early cancer detection are assessed annually in order to identify whether there is new scientific evidence sufficient to warrant a re-evaluation of current recommendations. If evidence is sufficiently compelling to consider a change or clarification in a current guideline or the development of a new guideline, a formal procedure is initiated. Guidelines are formally evaluated every five years regardless of whether new evidence suggests a change in the existing recommendations. There are nine steps in this procedure, and these "guidelines for guideline development" were formally established to provide a specific methodology for science and expert judgment to form the underpinnings of specific statements and recommendations from the Society. These procedures constitute a deliberate process to insure that all Society recommendations have the same methodological and evidence-based process at their core. This process also employs a system for rating strength and consistency of evidence that is similar to that employed by the Agency for Health Care Research and Quality (AHCRO) and the US Preventive Services Task Force (USPSTF).

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**Table 3F. Colon and Rectum Cancer Screening, Adults 50 and Older, by State, 2002**

|                   | % Recent fecal occult blood stool test* |                |                    |                                  |                      | % Recent sigmoidoscopy or colonoscopy† |                |                    |                                  |                      |
|-------------------|---|----------------|--------------------|----------------------------------|----------------------|--|----------------|--------------------|----------------------------------|----------------------|
|                   | 50 years and older                      | 50 to 64 years | 65 years and older | No usual source of medical care‡ | No health insurance§ | 50 years and older                     | 50 to 64 years | 65 years and older | No usual source of medical care‡ | No health insurance§ |
| Alabama           | 18.4                                    | 16.2           | 21.2               | 6.5                              | 5.2                  | 39.8                                   | 36.3           | 44.5               | 20.7                             | 23.9                 |
| Alaska            | 18.9                                    | 19.8           | 16.2               | 14.0                             | 16.2                 | 40.0                                   | 32.6           | 59.9               | 25.2                             | 11.8                 |
| Arizona           | 27.1                                    | 24.8           | 30.0               | 11.2                             | 9.7                  | 42.0                                   | 35.8           | 49.8               | 25.2                             | 11.3                 |
| Arkansas          | 15.9                                    | 12.4           | 20.1               | 7.3                              | 11.1                 | 32.6                                   | 26.7           | 39.8               | 19.7                             | 9.8                  |
| California        | 19.9                                    | 16.6           | 24.6               | 8.1                              | 2.8                  | 40.4                                   | 33.9           | 49.4               | 20.5                             | 14.2                 |
| Colorado          | 25.7                                    | 23.7           | 29.2               | 11.8                             | 9.6                  | 37.9                                   | 33.1           | 45.8               | 13.1                             | 9.2                  |
| Connecticut       | 27.2                                    | 24.8           | 30.0               | 14.0                             | 15.8                 | 49.0                                   | 45.0           | 53.8               | 24.9                             | 30.6                 |
| Delaware          | 23.3                                    | 20.0           | 27.4               | 14.6                             | 18.7                 | 51.7                                   | 48.7           | 55.5               | 24.9                             | 16.5                 |
| Dist. of Columbia | 29.1                                    | 24.8           | 34.6               | 24.1                             | ¶                    | 53.8                                   | 47.6           | 62.1               | 27.6                             | ¶                    |
| Florida           | 25.4                                    | 18.3           | 32.4               | 11.7                             | 8.4                  | 44.4                                   | 36.3           | 52.2               | 22.8                             | 18.8                 |
| Georgia           | 21.1                                    | 20.0           | 22.9               | 11.6                             | 7.5                  | 40.8                                   | 36.2           | 48.2               | 21.7                             | 19.3                 |
| Hawaii            | 24.4                                    | 22.2           | 27.0               | 11.3                             | 12.5                 | 33.2                                   | 27.9           | 39.6               | 15.8                             | 13.4                 |
| Idaho             | 17.2                                    | 15.4           | 19.6               | 9.3                              | 6.9                  | 36.0                                   | 31.3           | 42.5               | 20.9                             | 13.6                 |
| Illinois          | 18.4                                    | 16.6           | 20.7               | 4.7                              | 5.6                  | 37.0                                   | 33.3           | 42.0               | 9.1                              | 21.1                 |
| Indiana           | 17.3                                    | 15.7           | 19.4               | 8.4                              | 10.6                 | 33.6                                   | 30.1           | 38.2               | 16.7                             | 17.0                 |
| Iowa              | 24.7                                    | 22.5           | 27.1               | 6.4                              | 7.1                  | 39.2                                   | 32.0           | 47.0               | 18.5                             | 12.5                 |
| Kansas            | 24.5                                    | 19.3           | 30.6               | 10.3                             | 15.4                 | 38.5                                   | 33.1           | 44.8               | 17.6                             | 19.4                 |
| Kentucky          | 20.8                                    | 19.7           | 22.5               | 16.6                             | 13.4                 | 37.4                                   | 33.1           | 43.5               | 22.0                             | 15.6                 |
| Louisiana         | 19.8                                    | 16.7           | 24.2               | 13.1                             | 12.8                 | 34.0                                   | 28.6           | 41.5               | 24.0                             | 20.2                 |
| Maine             | 33.4                                    | 30.3           | 37.3               | 22.4                             | 18.2                 | 40.9                                   | 33.9           | 49.6               | 4.7                              | 18.3                 |
| Maryland          | 30.1                                    | 25.3           | 37.1               | 14.9                             | 22.5                 | 46.7                                   | 41.6           | 54.1               | 22.0                             | 17.0                 |
| Massachusetts     | 29.1                                    | 27.0           | 31.5               | 8.0                              | 18.3                 | 46.7                                   | 41.1           | 53.1               | 17.0                             | 25.0                 |
| Michigan          | 23.9                                    | 21.8           | 26.8               | 12.6                             | 11.7                 | 44.7                                   | 38.8           | 52.8               | 20.5                             | 28.0                 |
| Minnesota         | 23.6                                    | 20.5           | 27.8               | 11.6                             | ¶                    | 54.9                                   | 48.8           | 63.0               | 32.5                             | ¶                    |
| Mississippi       | 17.5                                    | 15.6           | 20.0               | 8.7                              | 4.2                  | 34.5                                   | 28.1           | 43.0               | 17.1                             | 9.7                  |
| Missouri          | 21.1                                    | 19.9           | 22.6               | 12.7                             | 16.6                 | 36.2                                   | 32.9           | 40.4               | 24.7                             | 26.3                 |
| Montana           | 18.7                                    | 17.8           | 19.8               | 9.0                              | 9.1                  | 38.7                                   | 31.2           | 48.5               | 21.0                             | 16.1                 |
| Nebraska          | 22.1                                    | 18.6           | 26.0               | 9.5                              | 8.1                  | 35.0                                   | 31.2           | 39.4               | 18.3                             | 22.2                 |
| Nevada            | 18.9                                    | 15.1           | 24.8               | 7.2                              | 4.4                  | 33.1                                   | 24.5           | 46.2               | 16.9                             | 11.2                 |
| New Hampshire     | 30.2                                    | 27.5           | 34.0               | 15.6                             | 14.5                 | 42.3                                   | 38.7           | 47.3               | 18.6                             | 18.3                 |
| New Jersey        | 19.9                                    | 15.4           | 25.9               | 5.9                              | 7.0                  | 41.2                                   | 33.9           | 50.6               | 19.9                             | 14.7                 |
| New Mexico        | 16.8                                    | 14.8           | 19.8               | 6.1                              | 6.2                  | 35.0                                   | 29.4           | 43.0               | 15.2                             | 14.1                 |
| New York          | 21.0                                    | 18.8           | 23.7               | 8.6                              | 9.0                  | 44.6                                   | 39.5           | 50.9               | 21.1                             | 24.7                 |
| North Carolina    | 29.4                                    | 28.3           | 30.9               | 11.8                             | 17.7                 | 40.8                                   | 37.5           | 45.6               | 17.9                             | 18.9                 |
| North Dakota      | 16.2                                    | 12.5           | 20.2               | 9.0                              | 5.3                  | 39.9                                   | 29.6           | 51.3               | 20.6                             | 15.7                 |
| Ohio              | 22.3                                    | 19.4           | 25.9               | 10.8                             | 18.6                 | 37.7                                   | 34.1           | 42.1               | 24.9                             | 25.3                 |
| Oklahoma          | 17.5                                    | 15.7           | 19.7               | 7.2                              | 8.9                  | 30.2                                   | 24.5           | 37.2               | 15.1                             | 13.4                 |
| Oregon            | 21.6                                    | 17.6           | 27.1               | 5.8                              | 5.9                  | 38.9                                   | 32.2           | 48.0               | 17.2                             | 20.4                 |
| Pennsylvania      | 20.0                                    | 16.2           | 24.1               | 9.6                              | 11.5                 | 39.0                                   | 33.6           | 44.8               | 15.7                             | 14.7                 |
| Rhode Island      | 28.1                                    | 25.1           | 31.2               | 12.4                             | 16.4                 | 47.8                                   | 42.1           | 54.0               | 25.4                             | 18.7                 |
| South Carolina    | 20.4                                    | 16.1           | 26.5               | 7.3                              | 10.0                 | 40.6                                   | 33.2           | 51.1               | 25.5                             | 27.0                 |
| South Dakota      | 20.7                                    | 19.1           | 22.3               | 13.7                             | 8.0                  | 34.4                                   | 27.1           | 42.3               | 25.1                             | 18.0                 |
| Tennessee         | 23.6                                    | 20.3           | 28.2               | 16.7                             | 9.7                  | 39.6                                   | 35.5           | 45.3               | 18.4                             | 18.6                 |
| Texas             | 16.4                                    | 14.7           | 18.9               | 6.7                              | 4.2                  | 36.2                                   | 29.7           | 45.7               | 12.4                             | 16.7                 |
| Utah              | 12.2                                    | 10.6           | 14.4               | 7.3                              | 5.0                  | 39.9                                   | 34.2           | 47.6               | 18.1                             | 29.3                 |
| Vermont           | 30.3                                    | 26.7           | 35.5               | 8.8                              | 14.4                 | 44.8                                   | 39.6           | 52.0               | 16.5                             | 21.9                 |
| Virginia          | 19.6                                    | 18.1           | 21.8               | 7.1                              | 12.4                 | 41.3                                   | 37.9           | 46.3               | 22.9                             | 19.1                 |
| Washington        | 26.1                                    | 25.0           | 27.5               | 7.0                              | 6.4                  | 43.0                                   | 37.6           | 51.1               | 19.9                             | 12.0                 |
| West Virginia     | 18.8                                    | 16.5           | 21.8               | 12.9                             | 10.3                 | 31.5                                   | 27.3           | 36.7               | 20.4                             | 16.3                 |
| Wisconsin         | 22.2                                    | 20.9           | 24.0               | 6.8                              | 13.0                 | 46.8                                   | 41.1           | 54.0               | 17.8                             | 27.9                 |
| Wyoming           | 12.5                                    | 10.6           | 15.4               | 6.8                              | 2.8                  | 30.1                                   | 24.0           | 39.2               | 15.6                             | 12.3                 |
| United States#    | 21.8                                    | 18.9           | 25.4               | 9.4                              | 9.0                  | 40.5                                   | 35.0           | 47.7               | 19.5                             | 18.5                 |
| Range             | 12.2-33.4                               | 10.6-30.3      | 14.4-37.3          | 4.7-24.1                         | 2.8-22.5             | 30.1-54.9                              | 24.0-48.8      | 36.7-63.0          | 4.7-32.5                         | 9.2-30.6             |

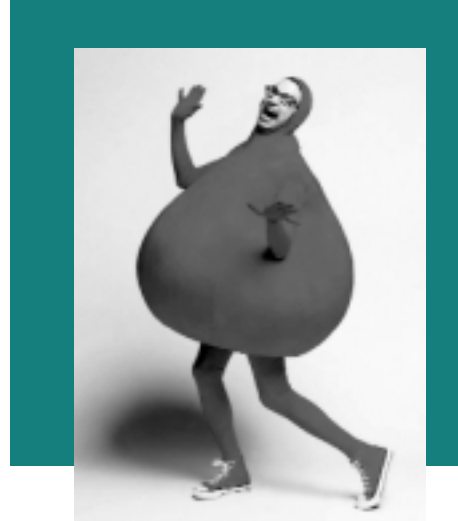
\*A fecal occult blood test within the last year. †A sigmoidoscopy or colonoscopy within the preceding five years. ‡Adults 50 and older who reported that they did not have a personal doctor or health care provider. §Adults 50 to 64 who reported that they did not have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare. ¶Sample size is insufficient to provide a stable estimate. #See Statistical Notes (p. 37) for definition. **Note:** The colorectal cancer screening prevalence estimates do not distinguish between examinations for screening or for diagnosis.

**Source:** Behavioral Risk Factor Surveillance System Public Use Data Tape 2002, National Center for Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2003.

American Cancer Society, Surveillance Research

cancer screening. To date, 18 states and the District of Columbia have passed such legislation (Figure 3A).<sup>123</sup> Since 1998, Medicare has included coverage for colorectal cancer screening, and since 2001, it has covered all recommended screening options. Also of note are recent strategies by the federal government (i.e., the Centers for Disease Control and Prevention Screen for Life awareness campaigns), private nonprofit organizations (i.e., The National Colorectal Cancer Roundtable), and the collaboration between the Ad Council and the American Cancer Society (i.e., Polyp Man<sup>®</sup>) to raise awareness about the importance of early detection for colorectal cancer screening.

- The Centers for Disease Control and Prevention’s colorectal cancer prevention and control initiative helps educate the public and health care providers about the importance of colon cancer screening.<sup>129</sup> In addition, the program conducts research on strategies to increase use of colorectal cancer screening rates.
- The National Colorectal Cancer Roundtable (NCCRT) is a national coalition of public, private, and voluntary organizations, co-founded by the American Cancer Society and the Centers for Disease Control and Prevention, whose mission is to advance colorectal cancer control efforts by improving communication, coordination, and collaboration among health agencies, medical-professional organizations, and the public. The ultimate goal of this multi-organization collaboration is to increase the use of proven colorectal



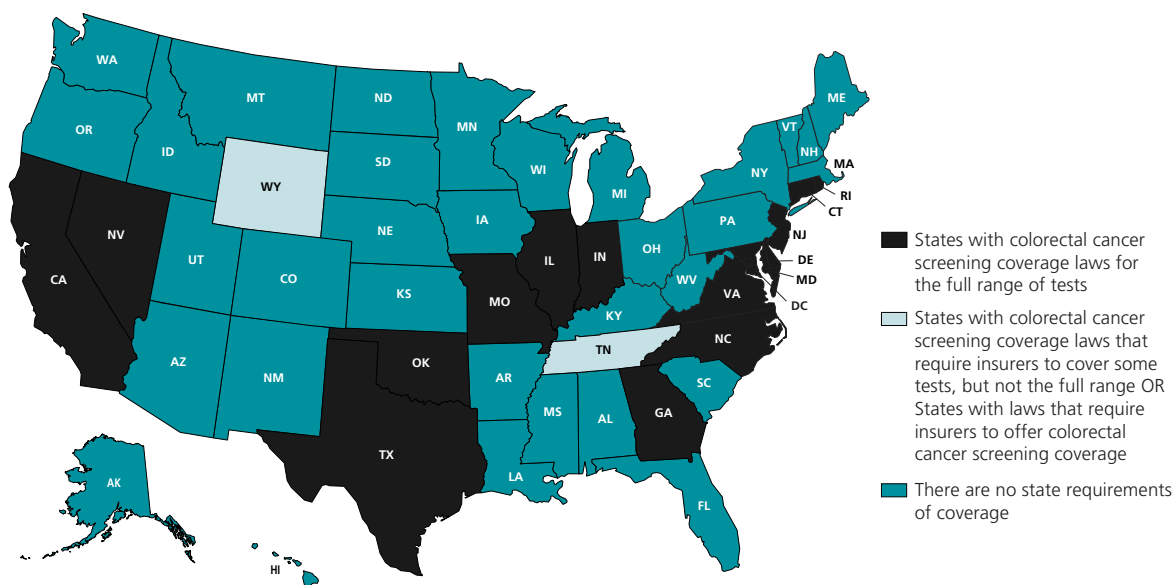
Polyp Man uses a humorous approach to raise awareness of a serious subject – colon cancer screening. Colon cancer is largely preventable and curable by screening and early detection.

cancer screening tests among the entire population for whom screening is appropriate.

- In 2001, the American Cancer Society began a multi-year colon cancer awareness campaign with the Ad Council, the premier nonprofit communications organization dedicated to stimulating action on public issues. With the Ad Council’s support, the Society has been able to build on its existing efforts and expand awareness through a memorable public service campaign featuring Polyp Man<sup>®</sup> and the message: “Colon cancer. Get the test. Get the polyp. Get the cure.”

The first year of the campaign focused on creating awareness around this issue in the general population. Year two of the campaign specifically targeted African American and Hispanic/Latino communities. In 2004, because of their increased risk, African Americans again will be the focus of the campaign.

**Figure 3A. Colon and Rectum Cancer Screening Coverage Legislation, by State, 2003**



Sources: National Government Relations Department, American Cancer Society; National Conference of State Legislatures, Health Policy Tracking Service, 7/00 and individual state bill tracking services, 8/03.

## Prostate Cancer Screening

Among US men, cancer of the prostate is the most commonly diagnosed cancer (other than skin cancer) and the second leading cause of cancer death. At present, there is not a consensus among national organizations regarding prostate cancer screening. The American Cancer Society and other medical organizations are in agreement that, pending the outcome of prospective randomized trials of the value of prostate cancer screening, shared decision making about testing for early prostate cancer should occur between men and their doctors.<sup>126,130</sup>

The American Cancer Society recommends that the prostate-specific antigen (PSA) blood test and a digital rectal exam (DRE) be offered annually to men over age 50 and that, prior to testing, they should be informed about the benefits and limitations of tests for early prostate cancer detection. Men at high risk, including African American men and men with a first degree relative diagnosed with prostate cancer at a young age, should begin screening at age 45 and should also be informed about the benefits and limitations before being tested.

The 2000 National Health Interview Survey was the first nationwide survey to include detailed PSA testing questions, including whether or not the advantages and disadvantages of the test were discussed beforehand. These questions allow the American Cancer Society's nationwide objective on prostate cancer screening to be measured. Approximately two-thirds of men had discussions with their doctors prior to testing.<sup>131</sup> While this percentage is substantial, it remains well below the 90% of men aged 50 and older who by 2015 should be following the American Cancer Society guidelines for prostate cancer screening. The same survey showed that 41% of men aged 50 and older had a PSA test within the past year and that men who had no usual source of care or health insurance were the least likely to have the test.<sup>120</sup>

The same detailed questions on the advantages and disadvantages of PSA testing are not available on the Behavioral Risk Factor Surveillance System. Across states (Table 3G), the recent PSA test percentages in 2002 for men aged 50 and older ranged from 37.4% in Hawaii to 63.9% in Rhode Island. The percentages of men 65 and older who received a PSA test within the past year were significantly higher than the corresponding percentages for men aged 50 to 64 in approximately three-quarters of the states.

The recent DRE percentages in 2002 for men aged 50 and older ranged from 33% in Hawaii to 68.6% in Rhode Island. Unlike the PSA percentages, there was little variability in these proportions by age. Only one-third of the states showed that men 65 and older had higher percentages of a DRE within the past year than men aged 50 to 64. Across all states, men 50 and older who lack a usual source of care and uninsured men (50 to 64 years old) were significantly less likely to have had a recent PSA or a DRE.

## Barriers and Opportunities to Improve Cancer Screening

Studies document that people who lack health care insurance have reduced access to preventive care and are less likely to get timely cancer screening examinations.<sup>132</sup> In people aged 65 and over, health insurance coverage is nearly universal because of the Medicare program.<sup>133</sup> However, among people under age 65 during 1994-2001, 16%-17% had no health insurance coverage, 9%-11% had Medicaid coverage, and 70%-73% had private insurance.<sup>83</sup> The uninsured were more likely to be at or below the poverty level, to be Hispanic or African American, and to report fewer years of education.<sup>132</sup> Changes in employment status can also affect health care coverage.<sup>133</sup> In 2002, more than 40% of uninsured adults postponed seeking medical care, and 28% said they needed but did not get medical care in the past year.<sup>134</sup> Uninsured people in this study were more likely to delay or forgo health care because of concerns about cost.<sup>135</sup>

Studies show that people who receive a clinician's recommendation for cancer screening are more likely to be screened compared to those who do not receive a recommendation.<sup>77</sup> Thus, experts agree that an effective strategy for improving cancer screening is to implement centralized or office-based systems (including computer-based reminder systems) to assist clinicians in counseling age- and risk-eligible patients about screening and to manage referrals and follow up.<sup>77,136</sup> In addition, multiple interventions directed at patients (strategies to raise awareness about the importance of cancer screening), physicians (strategies to assist them in their cancer screening counseling and follow up), and health care systems (strategies to ensure that high-quality and timely cancer screening is delivered to beneficiaries in a health care plan) may provide the best approach to improving rates of cancer screening.<sup>137,138</sup>

**Table 3G. Prostate Cancer Screening, Men 50 and Older, by State, 2002**

|                   | % Recent prostate-specific antigen test* |                |                    |                                  |                      | % Recent digital rectal exam† |                |                    |                                  |                      |
|-------------------|--|----------------|--------------------|----------------------------------|----------------------|-------------------------------|----------------|--------------------|----------------------------------|----------------------|
|                   | 50 years and older                       | 50 to 64 years | 65 years and older | No usual source of medical care‡ | No health insurance§ | 50 years and older            | 50 to 64 years | 65 years and older | No usual source of medical care‡ | No health insurance§ |
| Alabama           | 57.3                                     | 53.7           | 63.6               | ¶                                | ¶                    | 54.5                          | 51.2           | 60.4               | ¶                                | ¶                    |
| Alaska            | 50.6                                     | 49.7           | 53.6               | 39.2                             | ¶                    | 53.4                          | 52.2           | 57.6               | 42.3                             | 27.4                 |
| Arizona           | 58.6                                     | 52.9           | 66.9               | 24.3                             | ¶                    | 55.0                          | 52.5           | 58.7               | 28.0                             | ¶                    |
| Arkansas          | 52.2                                     | 47.9           | 58.8               | 29.6                             | 39.1                 | 47.9                          | 43.1           | 54.8               | 23.0                             | 38.1                 |
| California        | 53.4                                     | 46.9           | 66.0               | 27.6                             | ¶                    | 52.1                          | 48.2           | 59.4               | 19.8                             | ¶                    |
| Colorado          | 53.7                                     | 50.4           | 61.2               | 22.7                             | ¶                    | 53.1                          | 51.1           | 57.8               | 24.6                             | ¶                    |
| Connecticut       | 53.3                                     | 48.7           | 60.7               | 18.0                             | ¶                    | 58.0                          | 55.2           | 62.7               | 20.5                             | ¶                    |
| Delaware          | 63.2                                     | 60.8           | 67.4               | ¶                                | ¶                    | 60.4                          | 58.7           | 63.1               | ¶                                | ¶                    |
| Dist. of Columbia | 57.6                                     | 52.7           | 66.1               | ¶                                | ¶                    | 59.7                          | 53.1           | 72.4               | ¶                                | ¶                    |
| Florida           | 60.3                                     | 55.2           | 66.3               | 27.0                             | 29.1                 | 54.3                          | 50.7           | 58.6               | 27.7                             | 27.0                 |
| Georgia           | 54.8                                     | 51.3           | 62.1               | 25.7                             | 22.1                 | 50.8                          | 46.5           | 59.5               | 26.0                             | 17.5                 |
| Hawaii            | 37.4                                     | 31.5           | 45.8               | 14.2                             | 14.6                 | 33.0                          | 30.4           | 36.7               | 15.6                             | 19.2                 |
| Idaho             | 50.2                                     | 44.5           | 60.6               | 24.0                             | 24.2                 | 49.1                          | 46.0           | 54.4               | 24.2                             | 21.0                 |
| Illinois          | 47.9                                     | 43.4           | 56.1               | 11.4                             | ¶                    | 47.2                          | 44.2           | 52.6               | 13.9                             | ¶                    |
| Indiana           | 49.3                                     | 46.6           | 54.0               | 25.4                             | 30.0                 | 47.7                          | 46.8           | 49.1               | 25.1                             | 26.8                 |
| Iowa              | 56.9                                     | 51.4           | 64.6               | ¶                                | ¶                    | 55.0                          | 53.9           | 56.5               | ¶                                | ¶                    |
| Kansas            | 59.1                                     | 53.4           | 68.3               | 35.7                             | ¶                    | 54.0                          | 51.3           | 58.3               | 26.2                             | ¶                    |
| Kentucky          | 51.7                                     | 48.6           | 57.1               | 33.5                             | 28.8                 | 46.3                          | 44.8           | 49.0               | 33.3                             | 26.4                 |
| Louisiana         | 57.7                                     | 54.2           | 64.0               | 37.8                             | 37.0                 | 52.1                          | 49.9           | 55.9               | 36.5                             | 39.8                 |
| Maine             | 53.4                                     | 46.4           | 64.9               | ¶                                | ¶                    | 63.0                          | 59.9           | 68.1               | ¶                                | ¶                    |
| Maryland          | 58.7                                     | 54.1           | 67.0               | 21.8                             | ¶                    | 57.4                          | 52.5           | 66.4               | 21.9                             | ¶                    |
| Massachusetts     | 55.4                                     | 55.0           | 56.1               | 21.4                             | 28.2                 | 60.9                          | 63.2           | 57.1               | 24.2                             | 37.7                 |
| Michigan          | 54.3                                     | 49.5           | 62.8               | 21.2                             | 37.0                 | 53.4                          | 48.5           | 62.4               | 20.0                             | 27.6                 |
| Minnesota         | 53.4                                     | 45.5           | 67.0               | 26.5                             | ¶                    | 58.0                          | 52.9           | 66.6               | 33.3                             | ¶                    |
| Mississippi       | 51.5                                     | 47.5           | 58.3               | 22.3                             | 23.7                 | 46.8                          | 45.1           | 49.9               | 25.8                             | 25.3                 |
| Missouri          | 58.2                                     | 56.6           | 60.9               | 37.9                             | 39.2                 | 56.8                          | 56.6           | 57.0               | 34.7                             | 44.1                 |
| Montana           | 51.7                                     | 47.6           | 59.0               | 27.3                             | 29.5                 | 51.2                          | 48.8           | 55.2               | 29.8                             | 37.1                 |
| Nebraska          | 50.9                                     | 49.6           | 52.8               | 29.1                             | ¶                    | 42.4                          | 40.0           | 45.9               | 19.9                             | ¶                    |
| Nevada            | 55.0                                     | 50.1           | 63.7               | 26.8                             | 19.9                 | 43.2                          | 35.9           | 55.9               | 22.9                             | 18.9                 |
| New Hampshire     | 56.9                                     | 53.6           | 63.0               | 35.5                             | 33.3                 | 63.7                          | 61.3           | 68.2               | 27.8                             | 32.4                 |
| New Jersey        | 52.5                                     | 48.0           | 60.5               | 22.4                             | 56.6                 | 51.1                          | 47.4           | 57.7               | 21.1                             | 47.5                 |
| New Mexico        | 48.1                                     | 40.8           | 60.5               | 15.5                             | 11.4                 | 49.0                          | 42.1           | 60.8               | 19.0                             | 17.6                 |
| New York          | 54.9                                     | 48.8           | 65.6               | 31.3                             | ¶                    | 56.6                          | 53.5           | 62.0               | 25.3                             | ¶                    |
| North Carolina    | 53.3                                     | 49.1           | 61.4               | 25.4                             | 39.4                 | 53.5                          | 51.0           | 58.2               | 23.0                             | 38.9                 |
| North Dakota      | 46.6                                     | 39.4           | 58.2               | 20.1                             | ¶                    | 46.5                          | 38.9           | 58.6               | 21.9                             | ¶                    |
| Ohio              | 52.2                                     | 47.0           | 60.7               | 22.9                             | ¶                    | 47.2                          | 44.0           | 52.2               | 22.5                             | ¶                    |
| Oklahoma          | 50.9                                     | 45.5           | 59.7               | 31.3                             | 26.5                 | 45.0                          | 40.2           | 52.9               | 20.6                             | 22.0                 |
| Oregon            | 42.0                                     | 36.6           | 51.4               | 10.5                             | ¶                    | 43.4                          | 40.8           | 47.9               | 20.5                             | ¶                    |
| Pennsylvania      | 54.8                                     | 48.4           | 64.0               | 27.5                             | 34.3                 | 51.1                          | 46.4           | 58.0               | 26.8                             | 30.4                 |
| Rhode Island      | 63.9                                     | 61.8           | 66.9               | 26.7                             | ¶                    | 68.6                          | 64.5           | 74.6               | 27.6                             | ¶                    |
| South Carolina    | 58.4                                     | 53.9           | 66.9               | 31.7                             | 41.5                 | 52.7                          | 47.6           | 62.0               | 26.5                             | 23.9                 |
| South Dakota      | 54.5                                     | 50.5           | 60.4               | 24.5                             | 26.4                 | 48.6                          | 45.5           | 53.1               | 22.3                             | 21.0                 |
| Tennessee         | 55.9                                     | 51.2           | 64.8               | 31.3                             | ¶                    | 49.3                          | 49.4           | 49.3               | 22.5                             | ¶                    |
| Texas             | 50.2                                     | 46.2           | 57.8               | 20.8                             | 16.9                 | 46.9                          | 43.1           | 54.1               | 15.7                             | 16.3                 |
| Utah              | 47.0                                     | 40.5           | 58.4               | 25.4                             | ¶                    | 48.4                          | 45.5           | 53.3               | 24.6                             | ¶                    |
| Vermont           | 54.1                                     | 51.0           | 60.0               | 19.9                             | ¶                    | 57.9                          | 55.4           | 62.5               | 19.3                             | 35.3                 |
| Virginia          | 52.8                                     | 52.3           | 53.5               | 31.6                             | ¶                    | 52.6                          | 54.0           | 50.0               | 24.4                             | 33.6                 |
| Washington        | 45.6                                     | 43.3           | 49.8               | 18.6                             | 12.2                 | 49.5                          | 49.7           | 49.2               | 19.0                             | 9.1                  |
| West Virginia     | 54.1                                     | 50.2           | 60.4               | 29.2                             | ¶                    | 49.0                          | 44.6           | 55.9               | 26.7                             | ¶                    |
| Wisconsin         | 54.2                                     | 49.5           | 62.4               | 23.2                             | 27.1                 | 59.8                          | 56.7           | 64.8               | 26.8                             | 24.9                 |
| Wyoming           | 61.3                                     | 54.7           | 73.6               | 38.3                             | 22.8                 | 42.9                          | 35.5           | 56.9               | 21.8                             | 13.6                 |
| United States#    | 53.7                                     | 49.0           | 61.8               | 25.5                             | 28.2                 | 52.0                          | 48.9           | 57.2               | 23.1                             | 26.4                 |
| Range             | 37.4-63.9                                | 31.5-61.8      | 45.8-73.6          | 10.5-39.2                        | 11.4-56.6            | 33.0-68.6                     | 30.4-64.5      | 36.7-74.6          | 13.9-42.3                        | 9.1-47.5             |

\*A prostate-specific antigen test within the last year for men 50 and older who reported they were not told by a doctor, nurse, or other health professional that they had prostate cancer. †A digital rectal exam within the last year for men 50 and older who reported they were not told by a doctor, nurse, or other health professional that they had prostate cancer. ‡Men 50 and older who reported that they did not have a personal doctor or health care provider. §Men 50 to 64 who reported that they did not have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare. ¶Sample size is insufficient to provide a stable estimate. #See Statistical Notes (p. 37) for definition.

**Source:** Behavioral Risk Factor Surveillance System Public Use Data Tape 2002, National Center for Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2003.

American Cancer Society, Surveillance Research

# Statistical Notes

## Sample Surveys

In measuring the **prevalence** of certain behaviors in a **population**, it is usually costly and unfeasible to survey every person. Hence, most **population-based** surveys are conducted by choosing a randomly selected **sample** of people to estimate the true prevalence in a population. Such surveys are considered to have high external validity, and, therefore, results are considered applicable to the entire population that the sample represents. All of the adult statistics and most of the youth statistics presented in this publication have been **weighted** and are estimates of the true prevalence in the population. Some of the youth statistics presented in this publication are estimates of the students who participated in the survey and remain **unweighted**. The population-based survey methodology introduces sampling error to the estimated prevalence since a true prevalence is not calculated. In addition, a **standard error** is associated with the estimated prevalence and can be used to calculate the **confidence interval**. (See Other Statistical Terms below.)

**Prevalence:** The percentage of people exhibiting the behavior out of the total number in the defined population. For example, 66.7% of Floridian women aged 40 and older had a mammogram within the past year in 2002. The percentage of people exhibiting the behavior is 66.7%, and the defined population is women aged 40 and older living in Florida in 2002.

**Population:** A group of people defined by the survey. For example, the BRFSS data targets adults 18 and older, and the YRBSS data targets students in grades nine through 12 at public and private high schools.

**Population-based surveys:** A survey conducted to estimate the prevalence of a disease, risk factors, or other characteristic in an entire population in a city, state, or nation. For example, the BRFSS is designed to represent all residents in a given state, and the YRBSS is designed to represent all high school students in the nation, a state, or a city.

**Sample:** A smaller group of people chosen from the population defined by the survey. The sample is chosen based on the age, race, ethnic, and gender demographics of the city, state, or nation. At times, population-based surveys will oversample a particular age, race, ethnic, or gender group. This oversampling provides enough

responses to make valid estimates for a particular population of interest.

**Weighted data:** Data that are representative of an entire city, state, or nation. Once the sample of the population has completed the survey, statistical analyses are conducted to extrapolate the surveyed group's responses to the entire population (city, state, or nation). For example, BRFSS data in this publication are representative of all noninstitutionalized, civilian adults with telephones. Most YRBSS data in this publication are representative of all public and private high school students in grades nine through 12.

**Unweighted data:** Data that are only representative of the sample (surveyed group). The surveyed group's responses cannot be extrapolated to the entire population because the data are not reliable due to low response rates or other factors affecting survey quality. Some criteria to determine if data are reliable include the percentage of people who respond to the survey or the completeness of the survey questions. For example, YRBSS data are considered unweighted if less than 60% of the participants in a state or city return the survey. The collected data are still valid for the students who participated in the survey, but not for the entire intended population.

**Standard error:** A measure of variability around the estimated prevalence. A small value indicates a more precise prevalence estimate, whereas a larger value indicates a less precise prevalence estimate. The size of this measure is dependent upon the size of the sample.

## Other Statistical Terms

**Age-adjusted prevalence:** A statistical method used to adjust prevalence estimates to allow for valid comparisons between populations with different age compositions.

**Confidence interval:** A range of possible values for the estimated prevalence. A 90% confidence interval is one that will contain the true value in 90 out of 100 samples surveyed. Similarly, a 95% confidence interval will contain the true value in 95 out of 100 samples surveyed. A 95% confidence interval is commonly reported, and the following table reports the confidence interval ranges for the survey data.

*Example:* The confidence interval range for current cigarette smoking among adults is between 1% and 2.8%. The narrowest confidence interval is around the percentage for Pennsylvania (24.6%±1%) or (23.6, 25.6), and

the percentage for Alaska has the widest range of possible values (29.4%±2.8%) or (26.6, 32.2).

**Correlation:** Correlation quantifies the extent to which two independent quantities (variable X and Y) “go together.” When high values of X are associated with high values of Y, a positive correlation is said to exist. When high values of X are associated with low values of Y, a negative correlation is said to exist. The strength of a correlation between two variables, X and Y, is evaluated by using a statistical measure called the correlation coefficient. The p-value measures the likelihood that the

observed association occurred by chance alone; p-values less than 0.05 are considered statistically significant (but unlikely that the association occurred by chance).

**Range:** The lowest and highest values of a group of prevalence estimates.

**United States definition for state tables:** The state-based BRFSS data were aggregated to represent the United States. Due to the differences in sampling methodology and survey methods, this percentage may not be the same as the percentage reported by the NHIS.

### Confidence Interval (CI) Ranges for Percentages Listed in Tables, by State

| Table | Description  | 95% CI Range    |
|-------|--|-----------------|
| 1A    | Current cigarette smoking, high school students, total*                | ± 1.9% to 6.3%  |
| 1B    | Five or more vegetables and fruits a day, high school students, total* | ± 1.3% to 3.4%  |
|       | Moderate physical activity, high school students, total*               | ± 1.5% to 3.6%  |
|       | Vigorous physical activity, high school students, total*               | ± 1.9% to 3.9%  |
|       | At risk for becoming overweight, high school students, total*          | ± 1.0% to 2.8%  |
|       | Overweight, high school students, total*                               | ± 0.8% to 2.6%  |
| 2B    | Current cigarette smoking, men 18 and older                            | ± 1.7% to 4.4%  |
|       | Current cigarette smoking, women 18 and older                          | ± 1.3% to 3.7%  |
| 2C    | Clinical overweight, adults  | ± 1.1% to 2.9%  |
|       | Clinical obese, adults   | ± 1.0% to 2.7%  |
|       | No leisure-time physical activity, adults                              | ± 1.1% to 2.5%  |
|       | Moderate physical activity, adults                                     | ± 1.3% to 2.9%  |
|       | Vigorous physical activity, adults                                     | ± 1.1% to 2.8%  |
|       | Five or more fruits and vegetables a day, adults                       | ± 1.0% to 2.8%  |
| 3B    | Recent mammogram, women 40 and older                                   | ± 1.7% to 5.3%  |
|       | Recent mammogram, women 65 and older                                   | ± 2.7% to 11.2% |
| 3D    | Recent Pap test, women 18 and older                                    | ± 1.3% to 3.4%  |
|       | Recent Pap test, women 65 and older                                    | ± 3.6% to 12.0% |
| 3F    | Recent fecal occult blood test, adults 50 and older                    | ± 1.3% to 4.6%  |
|       | Recent sigmoidoscopy or colonoscopy, adults 50 and older               | ± 1.6% to 5.1%  |
| 3G    | Recent prostate-specific antigen test, men 50 and older                | ± 2.7% to 7.6%  |
|       | Recent digital rectal examination, men 50 and older                    | ± 2.7% to 7.3%  |

\*For states with weighted data only.

# Survey Sources

The statistics reported in this publication are compiled from several different publicly available surveys designed to provide prevalence estimates of health-related behaviors and practices for a city, state, or nation. The survey designs vary; some surveys provide prevalence estimates on a national level, whereas some surveys provide estimates on a state level.

A brief description of each survey follows:

**Behavioral Risk Factor Surveillance System (BRFSS).** The BRFSS is a survey of the Centers for Disease Control and Prevention (CDC), National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP), and the US states and territories. It is designed to provide state prevalence estimates on behavioral risk factors such as cigarette smoking, physical activity, and cancer screening. Data are gathered through monthly, computer-assisted telephone interviews with adults aged 18 and older, living in households in a state or US territory. The BRFSS is an annual survey, and all 50 states, the District of Columbia, and Puerto Rico have participated since 1996. The methods are generally comparable from state to state and from year to year, which allows states to monitor the effects of interventions over time. Prevalence estimates from BRFSS are subject to several limitations. For example, the prevalence estimates are only applicable to adults living in households with a residential telephone line. Although 95% of US households have telephones, the coverage ranges from 87% to 98% in the states and varies by state. For more information, visit the BRFSS Web site at [www.cdc.gov/nccdphp/brfss/](http://www.cdc.gov/nccdphp/brfss/).

**National Health and Nutrition Examination Survey (NHANES).** The NHANES is a survey of the Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS). The survey is designed to provide national prevalence estimates on the health and nutritional status of US adults and children, such as prevalence of major diseases, nutritional disorders, and potential risk factors. Data are gathered through in-person interviews and direct physical exams in mobile examination centers. Questions regarding diet and health are asked in the interview; the physical exam consists of medical and dental exams, physiological measurements, and laboratory tests. Three cycles of NHANES were conducted between 1971 and 1994; the most recent and third cycle (NHANES III) was conducted from 1988 to 1994. Beginning in 1999, NHANES was implemented as a continuous, annual survey. For more information, visit the NHANES Web site at [www.cdc.gov/nchs/nhanes.htm](http://www.cdc.gov/nchs/nhanes.htm).

**National Health Interview Survey (NHIS).** The NHIS is a survey of the Centers for Disease Control and Prevention (CDC),

National Center for Health Statistics (NCHS). The survey is designed to provide national prevalence estimates on personal, socioeconomic, demographic, and health characteristics, such as cigarette smoking and physical activity, of US adults. Data are gathered through a computer-assisted personal interview of adults aged 18 and older living in households in the United States. The NHIS is an annual survey and has been conducted by NCHS since 1957. For more information, visit the NHIS Web site at [www.cdc.gov/nchs/nhis.htm](http://www.cdc.gov/nchs/nhis.htm).

**National Youth Tobacco Survey (NYTS).** The National Youth Tobacco Survey is a survey of the Centers for Disease Control and Prevention (CDC) Foundation funded by the American Legacy Foundation. The survey is designed to provide national data for public and private students in grades six through 12. It allows for the design, implementation, and evaluation of a comprehensive tobacco-control program with more detailed tobacco-related questions than the YRBSS, including those on nontraditional tobacco products such as bidis, secondhand smoke exposure, smoking cessation, and school curriculum. Data are gathered through a self-administered questionnaire completed during a required subject or class period. The NYTS was first conducted in fall 1999, again in spring 2000, and will be conducted every other year.

**Youth Risk Behavior Surveillance System (YRBSS).** The YRBSS is a survey of the Centers for Disease Control and Prevention (CDC), National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP). The survey is designed to provide national, state, and local prevalence estimates on health risk behaviors, such as tobacco use, unhealthy dietary behaviors, physical inactivity, and others, among youth and young adults who attend public and private high schools. Different statistical methods are used to choose the representative sample for the national, state, and local prevalence estimates. (See Statistical Notes, p. 36.) Data are gathered through a self-administered questionnaire completed during a required subject or class period. The YRBSS is a biennial survey that began in 1991. The state and local surveys are of variable data quality, and caution should be used in comparing data among them. Data from states and local areas with an overall response rate of 60% and appropriate documentation are considered weighted and are generalized to all public and private high school students in grades nine through 12 in the respective jurisdiction. However, data from states and local areas without an overall response rate of 60% and those with inadequate documentation are reported unweighted and are only applicable to students participating in the survey. (See Statistical Notes, p. 36.) For more information, visit the YRBSS Web site at [www.cdc.gov/nccdphp/dash/yrbs/index.htm](http://www.cdc.gov/nccdphp/dash/yrbs/index.htm).



# References

1. American Cancer Society. *Cancer Facts & Figures 2004*. Atlanta (GA): American Cancer Society;2004.
2. Doll R, Peto R. *The Causes of Cancer*. New York (NY): Oxford Press;1981.
3. McGinnis JM, Foege WH. Actual causes of death in the United States. *JAMA* 1993;270:2207-2212.
4. Centers for Disease Control and Prevention. *Healthy Youth: An Investment in Our Nation's Future 2003*. Atlanta (GA): Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion;2003.
5. Serdula MK, Ivery D, Coates RJ, Freedman DS, Williamson DF, Byers T. Do obese children become obese adults? A review of the literature. *Prev Med* 1993;22:167-177.
6. US Department of Health and Human Services. *The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity*. Washington (DC): US Department of Health and Human Services;2001.
7. Centers for Disease Control and Prevention. Guidelines for school and community programs to promote lifelong physical activity among young people. *MMWR Morb Mortal Wkly Rep* 1997;46 (RR-6).
8. US Department of Health and Human Services. *Preventing Tobacco Use Among Young People: A Report of the Surgeon General*. Atlanta (GA): US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health;1994.
9. US Department of Health and Human Services. *Promoting Better Health for Young People Through Physical Activity and Sports*. Washington (DC): US Department of Health and Human Services and US Department of Education;2000.
10. Centers for Disease Control and Prevention. Youth Risk Behavior Surveillance – United States, 2001. *MMWR Morb Mortal Wkly Rep CDC Surveill Summ* 2002;51 (SS-4).
11. Johnston LD, O'Malley PM, Bachman JG. *The Monitoring the Future National Results on Adolescent Drug Use, 1975-2002. Volume I: Secondary School Students*. Bethesda (MD): National Institute on Drug Abuse;2003.
12. Federal Trade Commission. *Federal Trade Commission Cigarette Report for 2001*. Washington (DC): Federal Trade Commission;2003.
13. Centers for Disease Control and Prevention. Trends in cigarette smoking among high school students – United States, 1991-2001. *MMWR Morb Mortal Wkly Rep* 2002;51:409-412.
14. ImpacTeen. Higher Cigarette Prices Keep Kids from Starting to Smoke. Washington (DC): ImpacTeen and YES! for Bridging the Gap: Research Informing Practice for Healthy Youth Behavior [online]. Available at: [http://www.uic.edu/orgs/impacteen/generalarea\\_PDFs/4-20%20IT-YES%20Releasepaper2.pdf](http://www.uic.edu/orgs/impacteen/generalarea_PDFs/4-20%20IT-YES%20Releasepaper2.pdf) [Accessed on November 12, 2003].
15. Farrelly MC, Nimsch CT, James J. *State Cigarette Excise Taxes: Implications for Revenue and Tax Evasion*. Research Triangle Park (NC): RTI International, Health, Social, and Economics Research;2003.
16. Farrelly MC, Healton CG, Davis KC, Messeri P, Hersey JC, Haviland ML. Getting to the truth: evaluating national tobacco countermarketing campaigns. *Am J Public Health* 2002;92:901-907.
17. US Department of Health and Human Services. *Reducing Tobacco Use: A Report of the Surgeon General*. Atlanta (GA): US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health;2000.
18. Centers for Disease Control and Prevention. Youth Tobacco Surveillance – United States, 2000. *MMWR Morb Mortal Wkly Rep CDC Sur Summaries* 2001;50 (SS-4).
19. Centers for Disease Control and Prevention. School Health Policies and Programs Study 2000, State Level Summaries, Health Education (Table 1.4). Atlanta (GA): Centers for Disease Control and Prevention [online]. Available at: [http://www.cdc.gov/nccdphp/dash/shpps/summaries/health\\_ed/index.htm](http://www.cdc.gov/nccdphp/dash/shpps/summaries/health_ed/index.htm) [Accessed on October 13, 2003].
20. Centers for Disease Control and Prevention. Guidelines for school health programs to prevent tobacco use and addiction. *MMWR Morb Mortal Wkly Rep* 1994;43 (RR-2).
21. Hamilton W, Norton GD, Weintraub J. Independent Evaluation of the Massachusetts Tobacco Control Program. Cambridge (MA): Abt Associates, Inc;2003.
22. Garrison M, Christakis D, Ebel B, Wiehe S, Rivera F. Smoking cessation interventions for adolescents: a systematic review. *Am J Prev Med* 2003;25:363-367.
23. Youth Tobacco Cessation Collaborative. *National Blueprint for Action: Youth and Young Adult Tobacco-Use Cessation*. Washington (DC): Center for the Advancement of Health;2000.
24. Curry SJ. Youth tobacco cessation: filling the gap between what we do and what we know. *Am J Health Behav* 2003;27:S99-S102.
25. Orleans CT, Arkin EB, Backinger CL, et al. The youth cessation collaborative and national blue print for action. *Am J Health Behav* 2003;27:S103-S119.
26. Hopkins DP, Briss PA. A comparison of review methods in tobacco prevention and control guidelines. *Am J Health Behav* 2003;27:S120-S131.
27. Maule CO, Moyer CA, Lovato CY. Application of a better practices framework to review youth tobacco use cessation. *Am J Health Behav* 2003;27:S132-S143.
28. McDonald P, Colwell B, Backinger CL, Husten C, Maule CO. Better practices for youth tobacco cessation: evidence of review panel. *Am J Health Behav* 2003;27:S144-S158.
29. Milton MH, Maule CO, Backinger CL, Gregory DM. Recommendations and guidance for practice in youth tobacco cessation. *Am J Health Behav* 2003;27:S159-S169.

30. Backinger CL, McDonald P, Ossip-Klein DJ, et al. Improving the future of youth smoking cessation. *Am J Health Behav* 2003;27:S170-S184.
31. Guo SS, Roche AF, Chumlea WC, Gardner JD, Siervogel RM, Johnson CL. The predictive value of childhood body mass index values for overweight at age 35 years. *Am J Clin Nutr* 1994;59:810-819.
32. American Academy of Pediatrics. Prevention of pediatric overweight and obesity. *Pediatrics* 2003;112:424-430.
33. National Institutes of Health. *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults*. Bethesda (MD): National Institutes of Health, National Heart, Lung, and Blood Institute;1998.
34. Ogden CL, Flegal KM, Carroll MD, Johnson CL. Prevalence and trends in overweight among US children and adolescents, 1999-2000. *JAMA* 2002;288:1728-1732.
35. Schmidt CW. Obesity: a weighty issue for children. *Environ Health Perspect* 2003;111:A700-A707.
36. Schwartz RP. Soft drinks taste good, but the calories count. *J Pediatr* 2003;142:599-601.
37. Dietz W, Gortmaker S. Do we fatten our children at the television set? *Pediatrics* 1985;75:807-812.
38. Strasburger VC. Children, adolescents, and television. *Pediatr Rev* 1992;13:144-151.
39. Lowry R, Wechsler H, Galuska DA, Fluton JE, Kann L. Television viewing and its associations with overweight, sedentary lifestyle, and insufficient consumption of fruits and vegetables among US high school students: differences by race, ethnicity, and gender. *J Sch Health* 2002;72:413-421.
40. Andersen RE, Crespo CJ, Bartlett SJ, Cheskin LJ, Pratt M. Relationship of physical activity and television watching with body weight and level of fatness among children: results from the Third National Health and Nutrition Examination Survey. *JAMA* 1998;279:938-942.
41. Kuczmarski RJ, Ogden CL, Grummer-Strawn LM, et al. *CDC growth charts: United States (Advance Data no. 314)*. Hyattsville (MD): National Center for Health Statistics;2000.
42. Pate R, Baranowski T, Dowda M, Trost SG. Tracking of physical activity in young children. *Epidemiology* 1996;28:92-96.
43. US Department of Health and Human Services. *Physical Activity and Health: A Report of the Surgeon General*. Atlanta (GA): US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion;1996.
44. Kim S, Glynn N, Kriska A, et al. Decline in physical activity in black girls and white girls during adolescence. *N Engl J Med* 2002;347:709-715.
45. Pate RR, Freedson PS, Sallis JF, et al. Compliance with physical activity guidelines: prevalence in a population of children and youth. *Ann Epidemiol* 2002;12:303-308.
46. Jackson RJ. The impact of the built environment on health: an emerging field. *Am J Public Health* 2003;93:1382-1384.
47. Geller AL. Smart growth: a prescription for livable cities. *Am J Public Health* 2003;93:1410-1415.
48. Centers for Disease Control and Prevention. Barriers to children walking and biking to school. *MMWR Morb Mortal Wkly Rep* 2002;51:701-704.
49. Handy S, Boarnet M, Ewing R, Killingsworth R. How the built environment affects physical activity: views from urban planning. *Am J Prev Med* 2002;23 (suppl 2):64-73.
50. Staunton CE, Hubsmith D, Kallins W. Promoting safe walking and biking to school: the Marin County success story. *Am J Public Health* 2003;93:1431-1434.
51. Centers for Disease Control and Prevention. KidsWalk-to-School Web site. Atlanta (GA): Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, [online]. Available at: <http://www.cdc.gov/nccdphp/dnpa/kidswalk/index.htm> [Accessed on November 13, 2003].
52. Centers for Disease Control and Prevention. Physical activity levels among children aged 9-13 years - United States, 2002. *MMWR Morb Mortal Wkly Rep* 2003;52:785-788.
53. American Academy of Pediatrics. Organized sports for children and preadolescents. *Pediatrics* 2001;107:1459-1462.
54. Lino M, Gerrior SA, Basiotis PP, Anand RS. *Nutrition Insights: Report Card on the Diet Quality of Children (Oct 1998)*. Washington (DC): United States Department of Agriculture, Center for Nutrition Policy and Promotion;1998.
55. Bull NL. Dietary habits, food consumption, and nutrient intake during adolescence. *J Adolesc Health* 1992;13:384-388.
56. Lin B, Guthrie J, Frazao E. American children's diets not making the grade. *Food Review* 2001;24:8-17.
57. Lin B, Guthrie J, Frazao E. *Away-From-Home Foods Increasingly Important to Quality of American Diets (report no. 749)*. Washington (DC): US Department of Health and Human Services, US Department of Agriculture and Food and Drug Administration;1999.
58. Bowman SA, Gortmaker SL, Ebbeling CB, Pereira MA, Ludwig DS. Effects of fast-food consumption on energy intake and diet quality among children in a national household survey. *Pediatrics* 2004;113:112-118.
59. American Cancer Society 2001 Advisory Committee on Diet, Nutrition, and Cancer Prevention. Guidelines on diet, nutrition, and cancer prevention: reducing the risk of cancer with healthy food choices and physical activity. *CA Cancer J Clin* 2002;52:92-119.
60. Shannon C, Story M, Fulkerson JA, French SA. Factors in the school cafeteria influencing food choices by high school students. *J Sch Health* 2002;72:229-234.
61. Nestle M, Jacobson MF. Halting the obesity epidemic: a public health policy approach. *Public Health Reports* 2000;115:12-24.
62. American Academy of Pediatrics. Soft drinks in schools. *Pediatrics* 2004;113:152-154.
63. Harvard Center for Cancer Prevention. Harvard report on cancer prevention, volume 1: causes of human cancer. *Cancer Causes Control* 1996;7:S55.
64. Gallagher RP, McLean DI, Yang CP. Suntan, sunburn, pigmentation factors and the frequency of acquired melanocytic nevi in children. Similarities to melanoma: the Vancouver mole study. *Arch Dermatol* 1990;126:770-776.

65. Weinstock MA, Colditz GA, Willett WC, Stampfer MJ. Nonfamilial cutaneous melanoma incidence in women associated with sun exposure before 20 years of age. *Pediatrics* 1989;84:199-204.
66. Gallagher RP, Hill GB, Bajdik DR, Heenan PJ. Does intermittent sun exposure cause basal cell carcinoma? A case-control study in Western Australia. *Int J Cancer* 1995;131:157-163.
67. Centers for Disease Control and Prevention. Sun-protection behaviors used by adults for their children – United States, 1997. *MMWR Morb Mortal Wkly Rep* 1998;47:480-482.
68. Buller DB, Borland R. Public education projects in skin cancer prevention: child care, school, and college-based. *Clin Dermatol* 1998;16:447-459.
69. Cokkinides VE, Davis KJ, Weinstock M, et al. Sun exposure and sun-protection behaviors and attitudes among US youth, 11 to 18 years of age. *Prev Med* 2001;33:141-151.
70. Davis KJ, Cokkinides VE, Weinstock MA, O'Connell MC, Wingo PA. Summer sunburn and sun exposure among youth ages 11 to 18: national prevalence and associated factors. *Pediatrics* 2002;110:27-35.
71. Weinstock MA. Don't drop the Slop! *Photodermatol Photoimmunol Photomed* 2001;17:238-239.
72. International Agency for Research on Cancer. *IARC Handbooks of Cancer Prevention. Volume 5: Sunscreens*. Lyon, France: IARC Press;2001.
73. Cokkinides VE, Weinstock MA, O'Connell MC, Thun MJ. Use of indoor tanning sunlamps by US youth, ages 11-18 years, and by their parent or guardian caregivers: prevalence and correlates. *Pediatrics* 2002;109:1124-1130.
74. Centers for Disease Control and Prevention. Youth Risk Behavior Survey Results, United States, High School Survey Codebook. Atlanta (GA): Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion [online]. Available at: <http://www.cdc.gov/nccdphp/dash/yrbbs/data/2001/yrbbs2001.pdf> [Accessed on July 20, 2002].
75. Centers for Disease Control and Prevention. Guidelines for school programs to prevent skin cancers. *MMWR Morb Mortal Wkly Rep* 2002;51 (RR-4).
76. Centers for Disease Control and Prevention. Survey of knowledge of and awareness about melanoma – United States. *MMWR Morb Mortal Wkly Rep* 1996;45:346-349.
77. Curry SJ, Byers T, Hewitt M (eds). *Fulfilling the Potential of Cancer Prevention and Early Detection*. Washington (DC): The National Academies Press; 2003.
78. Centers for Disease Control and Prevention. Annual smoking-attributable mortality and years of potential life lost, and economic costs – United States, 1995-1999. *MMWR Morb Mortal Wkly Rep* 2002;51:300-303.
79. US Department of Health and Human Services. *Reducing the Health Consequences of Smoking: 25 Years of Progress. A Report to the Surgeon General*. Atlanta (GA): US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health;1989.
80. International Agency for Research on Cancer. *Tobacco Smoke and Involuntary Smoking, IARC monograph 83*. Lyon, France: IARC Press, 2002.
81. National Center for Health Statistics. *Health, United States, 1998, with Socioeconomic Status and Health Chartbook*. Hyattsville (MD): National Center for Health Statistics;2001.
82. Centers for Disease Control and Prevention. Cigarette smoking among adults – United States, 2001. *MMWR Morb Mortal Wkly Rep* 2003;52:953-956.
83. National Center for Health Statistics. *Health, United States, 2003 with Chartbook on Trends in the Health of Americans*. Hyattsville (MD): National Center for Health Statistics, Centers for Disease Control and Prevention;2003.
84. Orzechowski W, Walker RC. *The Tax Burden on Tobacco: Historical Compilation 2001. Impact and Opportunity (Vol. 36)*. Arlington (VA): Orzechowski and Walker;2001.
85. Fiore MC. The tobacco use and dependence clinical practice guideline panel, staff, and consortium representatives: a clinical practice guideline for treating tobacco use and dependence. A US Public Health Service report. *JAMA* 2000;293:3244-3254.
86. Centers for Disease Control and Prevention. *Best Practices for Comprehensive Tobacco Control Programs – August 1999*. Atlanta (GA): US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office of Smoking and Health;1999.
87. American Nonsmokers' Rights Foundation. Ordinance Counts Summary. Berkeley (CA): American Nonsmokers' Rights Foundation [online]. Available at: <http://www.no-smoke.org/mediaordlist.pdf> [Accessed on November 21, 2003].
88. American Nonsmokers' Rights Foundation. Municipalities with 100% smokefree workplace and/or restaurant ordinances. Berkeley (CA): American Nonsmokers' Rights Foundation [online]. Available at: <http://www.no-smoke.org/100ordlist.pdf> [Accessed on November 19, 2001].
89. American Nonsmokers' Rights Foundation. Municipalities with 100% smokefree ordinances in all workplaces, restaurants, and bars. Berkeley (CA): American Nonsmokers' Rights Foundation, [online]. Available at: <http://www.no-smoke.org/100ordswprblist.pdf> [Accessed on November 19, 2003].
90. American Nonsmokers' Rights Foundation. Municipalities with 100% smokefree freestanding bar ordinances. Berkeley (CA): American Nonsmokers' Rights Foundation [online]. Available at: <http://www.no-smoke.org/barordlist.pdf> [Accessed on November 19, 2003].
91. American Nonsmokers' Rights Foundation. United States population protected by 100% smokefree air laws. Berkeley (CA): American Nonsmokers' Rights Foundation [online]. Available at: <http://www.no-smoke.org/US%20Population%20Protected%20by%20100pct%20Laws.pdf> [Accessed on Nov 21, 2003].
92. American Nonsmokers' Rights Foundation. What to expect from the tobacco industry. Berkeley (CA): American Nonsmokers' Rights Foundation [online]. Available at: <http://www.no-smoke.org/expect.html> [Accessed on November 21, 2003].

93. Campaign for Tobacco-Free Kids. *A Broken Promise to Our Children. The 1998 Master Settlement Agreement Five Years Later*. Washington (DC): National Center for Tobacco-Free Kids;2003.
94. American Medical Association. *Tobacco Tax Challenge. SmokeLess States National Tobacco Policy Initiative*. Chicago (IL): American Medical Association;2003.
95. American Cancer Society. *Unpublished information as of October 2003*. Washington (DC): American Cancer Society, National Government Relations Department;2003.
96. National Cancer Institute. *Tobacco Product Excise Taxes* (Apr 2003). Bethesda (MD): National Cancer Institute, State Cancer Legislative Database Program;2003.
97. Gross CP, Soffer B, Bach PB, Rajkumar R, Forman H. State expenditures for tobacco-control programs and the tobacco settlement. *N Engl J Med* 2002;347:1080-1086.
98. World Cancer Research Fund. *Food, Nutrition and the Prevention of Cancer: A Global Perspective*. London (UK): World Cancer Research Fund;2000.
99. Flegal KM, Carroll MD, Ogden CL, Johnson CL. Prevalence and trends in obesity among US adults, 1999-2000. *JAMA* 2002;288:1723-1727.
100. Allison DB, Fontaine KR, Manson JE, Stevens J, VanItallie TB. Annual deaths attributable to obesity in the United States. *JAMA* 1999;282:1530-1538.
101. Must A, Spadano J, Coakley EH, Field AT, Colditz G, Dietz WH. The disease burden associated with overweight and obesity. *JAMA* 1999;282:1523-1529.
102. American Cancer Society. *Special Section on Obesity in: Cancer Facts & Figures 2000*. Atlanta (GA): American Cancer Society;2000.
103. Calle EE, Rodriguez C, Walker-Thurmond K, Thun MJ. Overweight, obesity, and mortality from cancer in a prospectively studied cohort of US adults. *N Engl J Med* 2003;348:1625-1638.
104. National Heart, Lung, and Blood Institute. *Aim for a Healthy Weight, Part 1: Assessing Your Risk*. Bethesda (MD): National Heart, Lung, and Blood Institute [online]. Available at: [http://www.nhlbi.nih.gov/health/public/heart/obesity/lose\\_wt/risk.htm#limitations](http://www.nhlbi.nih.gov/health/public/heart/obesity/lose_wt/risk.htm#limitations) [Accessed on October 29, 2002].
105. Koplan JP, Dietz WH. Caloric imbalance and public health policy. *JAMA* 1999;282:1579-1581.
106. Hill JO, Wyatt HR, Reed GW, Peters JC. Obesity and the environment: where do we go from here? *Science* 2003;299:853-855.
107. US Department of Health and Human Services. *DATA2010...the Healthy People 2010 database, June 2003 edition*. Hyattsville (MD): CDC Wonder [online]. Available at: <http://wonder.cdc.gov/data2010/> [Accessed on August 22, 2003].
108. Centers for Disease Control and Prevention. Prevalence of leisure-time and occupational physical activity among employed adults – United States, 1990. *MMWR Morb Mortal Wkly Rep* 2000;49:420-424.
109. Centers for Disease Control and Prevention. Prevalence of physical activity including lifestyles activities among adults, United States, 2000-2001. *MMWR Morb Mortal Wkly Rep* 2003;52:764-769.
110. Centers for Disease Control and Prevention. Increasing physical activity: a report on recommendations of the Task Force on Community Preventive Services. *MMWR Morb Mortal Wkly Rep* 2001;50 (RR-18).
111. Centers for Disease Control and Prevention. *Chronic Disease Notes & Reports, Fall 1996*. Atlanta (GA): Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion;1996.
112. Killingsworth RE, Lamming J. Development and Public Health. *Urban Land* 2001;12-17.
113. Killingsworth RE. Health promoting community design: a new paradigm to promote healthy and active communities. *Am J Health Promot* 2003;17:169-170.
114. National Cancer Institute. *5 A Day for Better Health Program*. Bethesda (MD): Division of Cancer Control and Population Sciences, National Cancer Institute [online]. Available at: [http://dccps.nci.nih.gov/5ad\\_2\\_evi.html](http://dccps.nci.nih.gov/5ad_2_evi.html) [Accessed on November 20, 2003].
115. Jeffery RW. Public health strategies for obesity treatment and prevention. *Am J Health Behav* 2001;25:252-259.
116. Beresford SA, Shannon J, McLerran D, Thompson B. Seattle 5 A Day worksite project: process evaluation. *Health Educ Behav* 2000;27:213-222.
117. Resnicow K, Kramish CA, Carr C, et al. Body and Soul: an effectiveness trial of a dietary intervention conducted through black churches. *Am J Public Health* (in review).
118. Greer DL. *Nebraska Rural Trails: Three Studies of Trail Impact*. Omaha (NE): University of Nebraska at Omaha, Recreation and Leisure Studies Program, School of Health, Physical Education and Recreation;2001.
119. Smith RA, Saslow D, Sawyer KA, Burke W, Costanza ME, Evans WP, Foster RS, Hendrick E, Eyre HJ, Sener S. American Cancer Society guidelines for breast cancer screening: update 2003. *CA Cancer J Clin* 2003;53:141-169.
120. Swan J, Breen N, Coates RJ, Rimer BK, Lee NC. Progress in cancer screening practices in the United States. Results from the 2000 National Health Interview Survey. *Cancer* 2003; 97:1528-1540.
121. Schiffman MH, Brinton LA, Devesa SS, Fraumeni J, Joseph F. Cervical Cancer. In: D. Schottenfeld and J. Fraumeni, Joseph F. (eds). *Cancer Epidemiology and Prevention*. New York (NY): Oxford University Press; 1996.
122. Centers for Disease Control and Prevention. *The National Breast and Cervical Cancer Early Detection Program – Reducing Mortality Through Screening*. Atlanta (GA): National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention [online]. Available at: <http://www.cdc.gov/cancer/nbccedp/nbcam.htm> [Accessed on September 30, 2003].

123. American Cancer Society. *How Do You Measure Up? A Progress Report on State Legislative Activity to Reduce Cancer Incidence and Mortality*. Atlanta (GA): American Cancer Society;2003.
124. Paskett ED, Tatum CM, D'Agostino R, et al. Community-based interventions to improve breast and cervical cancer screening: results of the Forsyth County Cancer Screening (FoCaS) Project. *Cancer Epidemiol Biomarkers Prev* 1999;8:453-459.
125. Pignone M, Rich M, Teutsch S, Berg AO, Lohr KN. Screening for colorectal cancer in adults at average risk: a summary of the evidence for the US Preventive Services Task Force. *Ann Internal Med* 2002;137:132-141.
126. Smith RA, von Eschenbach A, Wender R, et al. American Cancer Society guidelines for the early detection of cancer: update of early detection guidelines for prostate, colorectal, and endometrial cancers. Also: Update 2001 – testing for early lung cancer detection. *CA Cancer J Clin* 2001;51:38-75.
127. Centers for Disease Control and Prevention. Colorectal cancer test use among persons aged  $\geq$  50 years – United States, 2001. *MMWR Morb Mortal Wkly Rep* 2003;52:193-196.
128. Cokkinides VE, Chao A, Smith RA, Vernon SW, Thun MJ. Correlates of underutilization of colorectal cancer screening among US adults, age 50 years and older. *Prev Med* 2003;36:85-96.
129. Centers for Disease Control and Prevention. Screen for Life: National Colorectal Cancer Action Campaign. Atlanta (GA): National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention [online]. Available at: <http://www.cdc.gov/cancer/screenforlife/spot-light.htm> [Accessed on September 30, 2003].
130. US Preventive Services Task Force. Screening for Prostate Cancer: Recommendations and Rationale. Washington (DC): US Preventive Services Task Force [online]. Available at: <http://www.ahrq.gov/clinic/3rduspstf/prostatescr/prostaterr.htm> [Accessed on March 24, 2004].
131. Lu-Yao G, Stukel TA, Yao S-L. Prostate-specific antigen screening in elderly men. *J Natl Cancer Inst* 2003;95:1792-1796.
132. Institute of Medicine. Care without Coverage: Too Little, Too Late (report brief). Washington (DC): Institute of Medicine, National Academy Press [online]. Available at: [http://books.nap.edu/html/care\\_without/reportbrief.pdf](http://books.nap.edu/html/care_without/reportbrief.pdf) [Accessed on September 17, 2002].
133. Schoenborn CA, Adams PF, Schiller JS. Summary Health Statistics for the US Population: National Health Interview Survey, 2000. *Vital Health Stat* 2003;10 (214):1-83.
134. Kaiser Commission on Medicaid and the Uninsured. *The Uninsured and their Access to Health Care (fact sheet)*. Washington (DC): The Henry J. Kaiser Family Foundation;2003.
135. Ayanian J, Weissman J, Schneider E, Ginsburg J, Zaslavsky A. Unmet health needs of uninsured adults in the United States. *JAMA* 2000;284:2061-2069.
136. Rakowski W, Lipkus IM, Clark MA, et al. Reminder letter, tailored stepped-care, and self-choice comparison for repeat mammography. *Am J Prev Med* 2003;25:308-314.
137. Breen N, Wagener DK, Brown ML, Davis WW, Ballard-Barbash R. Progress in cancer screening over a decade: results of cancer screening from the 1987, 1992, and 1998 National Health Interview Surveys. *J Natl Cancer Inst* 2001;93:1704-1713.
138. Rimer BK, Conaway M, Lyna P, et al. The impact of tailored interventions on a community health center population. *Patient Educ Couns* 1999;37:125-140.

# List of Tables and Figures

## Tables

|  |    |
|--|----|
| 1A. Tobacco Use, High School Students, by State and City, 2001   | 5  |
| 1B. Overweight and Related Factors, High School Students, by State and City, 2001                            | 7  |
| 2A. Current Cigarette Use, Adults 18 and Older, United States, 2001  | 13 |
| 2B. Tobacco Use, Adults 18 and Older, 2002, and Comprehensive Tobacco Control Measures, by State, 2003, 2004 | 15 |
| 2C. Overweight, Obesity, and Related Factors, Adults 18 and Older, by State, 2001 and 2002                   | 21 |
| 3A. Mammography, Women 40 and Older, United States, 2000   | 26 |
| 3B. Mammography and Clinical Breast Exam, Women 40 and Older, by State, 2002                                 | 27 |
| 3C. Pap Test, Women 18 and Older, United States, 2000  | 28 |
| 3D. Pap Test, Women 18 and Older, by State, 2002   | 29 |
| 3E. Colon and Rectum Cancer Screening, Adults 50 and Older, United States, 2000                              | 30 |
| 3F. Colon and Rectum Cancer Screening, Adults 50 and Older, by State, 2002                                   | 32 |
| 3G. Prostate Cancer Screening, Men 50 and Older, by State, 2002  | 35 |

## Figures

|   |    |
|---|----|
| 1A. Current Cigarette Smoking Among 12th Graders, by Race/Ethnicity, 1977-2002  | 2  |
| 1B. Domestic Expenditures on Cigarette Advertising and Promotion, United States, 1963-2001                                  | 3  |
| 1C. Current Cigarette Smoking Among High School Students, by Race/Ethnicity and Gender, 1991-2001                           | 3  |
| 1D. Overweight Children and Adolescents, by Age Group, 1971-2000  | 6  |
| 1E. Combined Youth Overweight Versus Three or More Hours of Television Watching, by State, 2001                             | 8  |
| 1F. Policies for Required Sun Safety or Skin Cancer Prevention in Schools, by State, 2000                                   | 11 |
| 2A. Current Cigarette Smoking by Education, Adults 25 and Older, 1974-2001  | 12 |
| 2B. Risk of Death from Smoking-related Cancers, Cancer Prevention Study II, Men and Women, 1984-1991                        | 14 |
| 2C. Trends in Per Capita Cigarette Consumption for Selected States and the Average Consumption Across All States, 1980-2001 | 16 |
| 2D. Strong Local Smoke-free Ordinances in the United States, November 2003  | 16 |
| 2E. Funding for Tobacco Prevention, by State, 2004  | 17 |
| 2F. Tobacco Excise Tax, by State, 2003  | 17 |
| 2G. Cancer Mortality by Body Mass Index for United States Men and Women in the Cancer Prevention Study II, 1982-1998        | 19 |
| 2H. Adult Obesity, by Gender, Ages 20-74, 1960-2000   | 20 |
| 2I. Overweight Adults in the United States, by State, 1992-2002   | 22 |
| 3A. Colon and Rectum Cancer Screening Coverage Legislation, by State, 2003  | 33 |

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