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# Preface

Much of the suffering and death from cancer could be prevented by more systematic efforts to reduce tobacco use, improve diet and physical activity, reduce obesity, and expand the use of established screening tests. The American Cancer Society estimates that in 2011 about 171,600 cancer deaths will be caused by tobacco use alone. In addition, approximately one-third of the 571,950 cancer deaths expected to occur in 2011 are attributed to poor nutrition, physical inactivity, overweight, and obesity.<sup>1-3</sup> Regular use of some established screening tests can prevent the development of cancer through identification and removal or treatment of premalignant abnormalities; screening tests can also improve survival and decrease mortality by detecting cancer at an early stage when treatment is more effective.

## Highlights, CPED 2011

### Tobacco Use

- Smoking rates in US adults and youth have stalled. Among adults, the smoking rate remained unchanged in the past 6 years (2009: 20.6%). Among high school students, the smoking prevalence did not change significantly between 2003 and 2009 (19.5%), but smokeless products' use is increasing in some groups. Smoking among middle school students also did not change between 2006 and 2009 (5.2%).
- States' funding for tobacco control (\$517.9 million) in 2011 was the lowest amount allocated since the 1999 Master Settlement Agreement (MSA), with only 2% of states' revenue from tobacco taxes and the MSA allocated for tobacco control.
- Federal tobacco control funding to some extent offset declines in states' funding. Several federal tobacco control initiatives, including US Food and Drug Administration regulations and funding for tobacco control, went into effect in 2010. Provisions for tobacco dependence treatment coverage in the Affordable Care Act for previously uninsured individuals, Medicare, and Medicaid recipients either went into effect in 2010 or will be implemented in upcoming years.
- As tobacco marketing and sales become more restrictive due to regulations, the industry is moving toward unregulated venues and products. For example, point-of-source advertising and promotions are increasingly being targeted by the industry, as are products such as small cigars that are not subject to the same regulations governing cigarette sales and marketing.

The American Cancer Society has published *Cancer Prevention & Early Detection Facts & Figures* (CPED) annually since 1992 as a resource to strengthen cancer prevention and early detection efforts at the local, state, and national levels. CPED complements the Society's flagship publication, *Cancer Facts & Figures*, by disseminating information related to cancer control. Cancer prevention and early detection are central to the American Cancer Society's mission and its 2015 goals. The mission of the Society is to save lives from cancer by helping people stay well and get well, by finding cures, and by fighting back. In 1999, the American Cancer Society set challenge goals for the US that, if met, would substantially lower cancer incidence and mortality rates and would improve the quality of life for all cancer survivors by the year 2015. The Society also has developed nationwide objectives for prevention and early detection that set the framework for achieving the 2015 goals. (See sidebar, page 2.) These

### Overweight and Obesity, Physical Activity, and Nutrition

- The *American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention* highlight the importance of individual nutritional and physical activity choices for cancer prevention and community efforts to facilitate such choices.
- Currently, an estimated 18.1% of adolescents and 34.3% of adults are obese. Increasing rates of obesity observed since the early 1980s appear to have slowed in the past decade, particularly among women and girls.
- In 2009, the prevalence of obesity among adults exceeded 20% in all states except Colorado (19.3%).

### HPV Vaccination for Cervical Cancer Prevention

- To prevent cervical cancer, vaccination against certain types of human papillomavirus (HPV) is recommended for adolescent girls. The initiation of the HPV vaccination series among US females aged 13 to 17 increased from 25% in 2007 to 44% in 2009, and nearly one in three completed the entire series.

### Cancer Screening

- Mammography usage has not increased since 2000. In 2008, 53% of women aged 40 and older reported getting a mammogram in the past year. Women who lack health insurance have the lowest use of mammograms (26%).
- In 2008, 78.3% of adult women had a Pap test in the past three years. However, there is persistent under-use of the Pap test among women who are uninsured, recent immigrants, and those with low education.
- Colorectal cancer screening rates increased from 38% in 2000 to 53.2% in 2008; however, rates remain substantially lower in uninsured individuals. To date, 26 states and the District of Columbia have passed legislation ensuring coverage for the full range of colorectal cancer screening tests.

objectives can be achieved by improved collaboration among government agencies, private companies, other nonprofit organizations, health care providers, policy makers, and the American public.

Social, economic, and legislative factors profoundly influence individual health behaviors. For example, the price and availability of healthy foods, the incentives and opportunities for regular physical activity in schools and communities, the content of advertising aimed at children, and the availability of insurance coverage for screening tests and treatment for tobacco addiction all influence individual choices. These issues not only affect a person's cancer risk, but also the risk of other major diseases. The Society has joined forces with the American Heart

Association and the American Diabetes Association to identify strategies that will improve prevention and early detection efforts for all of the major chronic diseases in the US.

Public policy and legislation at the federal, state, and local levels can increase access to preventive health services, including cancer screening. At both the federal and state levels, the Society has advocated for laws requiring insurers to provide coverage for recommended cancer screening in health care plans, such as coverage for the full range of colorectal cancer screening tests. At the state level, the Society has spearheaded campaigns to protect nonsmokers from tobacco smoke in public places. These and other community, policy, and legislative initiatives are highlighted in this publication.

## American Cancer Society Challenge 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 are current cigarette smokers.
- Reduce to 0.4% the proportion of adults (18 and older) who are current users of smokeless tobacco.

#### Youth Tobacco Use

- Reduce to 10% the proportion of high school students (younger than 18) who are current cigarette smokers.
- Reduce to 1% the proportion of high school students (younger than 18) who are current users of smokeless tobacco.

#### Nutrition & Physical Activity

- The trend of increasing prevalence of overweight and obesity among US adults and youth will have been reversed, and the prevalence of overweight and obesity will be no higher than it was in 2005.
- Increase to 70% the proportion of adults and youth 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*.

- 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*.

#### 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; properly apply sunscreen with an SPF of 15 or higher; and avoid artificial sources of ultraviolet light (e.g., sunlamps, tanning booths).

#### Breast Cancer Early Detection

- Increase to 90% the proportion of women aged 40 and older who have breast cancer screening consistent with American Cancer Society guidelines.

#### Colorectal Cancer Early Detection

- Increase to 75% the proportion of people aged 50 and older who have colorectal cancer screening consistent with American Cancer Society guidelines.

#### Prostate Cancer Early Detection

- Increase to 90% the proportion of men who follow age-appropriate American Cancer Society detection guidelines for prostate cancer.

# Tobacco Use

Tobacco use remains the single largest preventable cause of disease and premature death in the US. Each year, smoking results in an estimated 443,000 premature deaths, of which about 49,400 are in nonsmokers as a result of exposure to secondhand smoke. Smoking also accounts for \$193 billion in health care expenditures and productivity losses.<sup>4</sup>

## Youth Tobacco Use

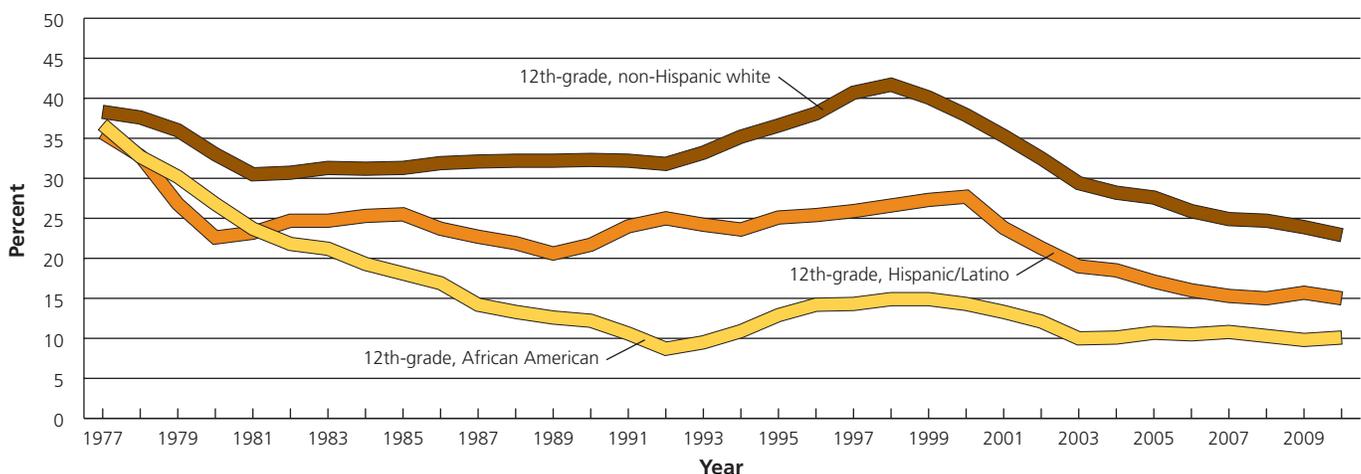
Most smokers become addicted to tobacco before they are legally old enough to buy cigarettes. Addiction develops rapidly in adolescents who experiment with tobacco, and most adolescents who become regular smokers continue to smoke into adulthood.<sup>5,6</sup> Because the likelihood of developing smoking-related cancers such as lung cancer increases with the duration of smoking, those who start at younger ages and continue to smoke are at highest risk for tobacco-related illness and death.<sup>6</sup>

## Current Patterns and Trends in Cigarette Smoking

- In 2009, data from the Youth Risk Behavior Survey (YRBS) showed that 19.5% of high school students reported current cigarette smoking (smoking on at least one day in the past 30 days) and 7.3% reported frequent smoking (smoking on 20 or more of the past 30 days) (Table 1A, page 4).

- Although the percentage of high school students who reported current cigarette smoking decreased from 1997 to 2003, the prevalence did not change significantly between 2003 and 2009. Other surveys have also generally found slowing or stalling declines among youth.<sup>7,8</sup> Smoking rates were stable for all gender and racial/ethnic groups except African American females, who have shown a continuous decline since 1999.<sup>9</sup>
- According to the Monitoring the Future survey, cigarette smoking varies by race/ethnicity among 12th-graders, with prevalence being highest among non-Hispanic whites, followed by Hispanics/Latinos, and the lowest among African Americans (Figure 1A).
- Of the 42 states surveyed in 2009, Utah had the lowest high school student smoking prevalence (8.5%) and Kentucky had the highest rate (26.1%) (Table 1A, page 4).
- The National Youth Tobacco Survey (NYTS) found that 5.2% of middle school students were current smokers in 2009. The current smoking rate in middle school students overall did not change between 2006 and 2009; however, among females and non-Hispanic whites there were significant declines.<sup>8</sup>
- Susceptibility to start cigarette smoking (never smokers who reported an openness to try cigarettes) was 21.2% in middle school students and 24% in high school students in 2009, with no overall decline between 2000 and 2009.<sup>8</sup>

Figure 1A. Cigarette Smoking Trends\*, 12th-graders, by Race/Ethnicity, US, 1977-2010†



\*Used cigarettes in the past 30 days. †Percentages are two-year moving averages (data for specified year and previous year have been combined).

Source: Monitoring the Future survey, 1975-2010, University of Michigan.

American Cancer Society, Surveillance Research, 2011

**Table 1A. Tobacco Use, High School Students, by State and City/County, US, 2009**

| Location                         | % Current cigarette smoking* | Rank <sup>†</sup> | % Frequent cigarette smoking <sup>‡</sup> | % Current cigar use <sup>§</sup> | % Current smokeless tobacco use <sup>¶</sup> |
|----------------------------------|------------------------------|-------------------|---|----------------------------------|--|
| <b>United States</b>             | 19.5                         |                   | 7.3                                       | 14.0                             | 8.9  |
| <b>State</b>                     |                              |                   |   |                                  |  |
| Alabama                          | 20.8                         | 31                | 8.6                                       | 16.6                             | 12.4   |
| Alaska                           | 15.7                         | 7                 | 5.1                                       | 10.3                             | 13.6   |
| Arizona                          | 19.7                         | 28                | 6.2                                       | 18.0                             | 6.9  |
| Arkansas                         | 20.3                         | 29                | 9.7                                       | 16.7                             | 12.4   |
| Colorado                         | 17.7                         | 17                | 7.8                                       | 16.3                             | 10.7   |
| Connecticut                      | 17.8                         | 19                | 6.2                                       | N/A                              | N/A  |
| Delaware                         | 19.0                         | 26                | 7.8                                       | 11.8                             | 6.8  |
| Florida                          | 16.1                         | 9                 | 6.2                                       | 14.4                             | 7.1  |
| Georgia                          | 16.9                         | 10                | 6.3                                       | 13.7                             | 8.5  |
| Hawaii                           | 15.2                         | 6                 | 4.8                                       | N/A                              | 4.9  |
| Idaho                            | 14.5                         | 4                 | 4.4                                       | 12.0                             | 9.4  |
| Illinois                         | 18.1                         | 20                | 7.6                                       | 14.1                             | 8.3  |
| Indiana                          | 23.5                         | 40                | 11.8                                      | 16.9                             | 10.7   |
| Kansas                           | 16.9                         | 11                | 6.5                                       | 12.7                             | 8.1  |
| Kentucky                         | 26.1                         | 42                | 12.0                                      | 17.2                             | 14.2   |
| Louisiana                        | 17.6                         | 15                | 6.2                                       | 14.0                             | 9.6  |
| Maine                            | 18.1                         | 21                | 8.6                                       | 14.9                             | 8.6  |
| Maryland                         | 11.9                         | 2                 | 4.4                                       | 12.7                             | 5.4  |
| Massachusetts                    | 16.0                         | 8                 | 6.9                                       | 14.9                             | 7.9  |
| Michigan                         | 18.8                         | 24                | 7.8                                       | 14.7                             | 10.6   |
| Mississippi                      | 19.6                         | 27                | 8.5                                       | 15.4                             | 8.6  |
| Missouri                         | 18.9                         | 25                | 6.8                                       | 13.5                             | 9.3  |
| Montana                          | 18.7                         | 23                | 7.9                                       | 17.8                             | 14.6   |
| Nevada                           | 17.0                         | 13                | 6.4                                       | N/A                              | 5.5  |
| New Hampshire                    | 20.8                         | 32                | 9.5                                       | 16.1                             | 8.4  |
| New Jersey                       | 17.0                         | 14                | 5.5                                       | N/A                              | N/A  |
| New Mexico                       | 24.0                         | 41                | 7.2                                       | 18.1                             | 11.8   |
| New York                         | 14.8                         | 5                 | 5.8                                       | 12.7                             | 7.5  |
| North Carolina                   | 17.7                         | 18                | 6.3                                       | N/A                              | N/A  |
| North Dakota                     | 22.4                         | 37                | 9.3                                       | 12.4                             | 15.3   |
| Oklahoma                         | 22.6                         | 38                | 9.1                                       | 14.1                             | 10.5   |
| Pennsylvania                     | 18.4                         | 22                | 7.6                                       | 12.2                             | 7.6  |
| Rhode Island                     | 13.3                         | 3                 | 5.4                                       | 10.1                             | 6.1  |
| South Carolina                   | 20.5                         | 30                | 7.8                                       | 14.7                             | 10.4   |
| South Dakota                     | 23.2                         | 39                | 9.1                                       | N/A                              | 14.6   |
| Tennessee                        | 20.9                         | 33                | 9.9                                       | 17.0                             | 12.2   |
| Texas                            | 21.2                         | 34                | 6.2                                       | 16.5                             | 7.4  |
| Utah                             | 8.5                          | 1                 | 2.6                                       | 6.8                              | 5.5  |
| Vermont                          | 17.6                         | 16                | 7.9                                       | 13.7                             | 9.1  |
| West Virginia                    | 21.8                         | 35                | 11.4                                      | 14.3                             | 14.4   |
| Wisconsin                        | 16.9                         | 12                | 7.1                                       | 14.9                             | 8.5  |
| Wyoming                          | 22.1                         | 36                | 9.8                                       | N/A                              | 16.2   |
| <b>City/County</b>               |                              |                   |   |                                  |  |
| Boston, MA                       | 10.3                         | 4                 | 3.1                                       | 8.1                              | 2.8  |
| Broward County, FL               | 13.1                         | 14                | 5.0                                       | 11.1                             | 5.2  |
| Charlotte-Mecklenburg County, NC | 13.0                         | 13                | 4.2                                       | N/A                              | 4.8  |
| Chicago, IL                      | 12.5                         | 12                | 2.7                                       | 13.1                             | 5.3  |
| Clark County, NV                 | 15.4                         | 18                | 6.4                                       | N/A                              | 4.2  |
| Dallas, TX                       | 11.4                         | 10                | 2.2                                       | 14.8                             | 3.1  |
| Detroit, MI                      | 7.1                          | 2                 | 1.5                                       | 15.4                             | 7.4  |
| Duval County, FL                 | 15.4                         | 19                | 5.9                                       | 17.0                             | 9.2  |
| Los Angeles, CA                  | 10.9                         | 8                 | 1.6                                       | 9.0                              | 3.2  |
| Memphis, TN                      | 5.9                          | 1                 | 2.2                                       | 11.8                             | 2.8  |
| Miami-Dade County, FL            | 13.9                         | 15                | 3.5                                       | 9.2                              | 3.5  |
| Milwaukee, WI                    | 10.5                         | 6                 | 4.3                                       | N/A                              | N/A  |
| New York City, NY                | 8.4                          | 3                 | 2.4                                       | 5.9                              | 3.4  |
| Orange County, FL                | 15.0                         | 16                | 4.9                                       | 13.3                             | 4.2  |
| Palm Beach County, FL            | 15.4                         | 20                | 5.6                                       | 11.7                             | 5.2  |
| Philadelphia, PA                 | 10.8                         | 7                 | 3.6                                       | 6.6                              | 3.2  |
| San Bernardino, CA               | 15.2                         | 17                | 3.6                                       | 10.6                             | 3.8  |
| San Diego, CA                    | 11.7                         | 11                | 2.8                                       | 9.1                              | 2.4  |
| San Francisco, CA                | 10.4                         | 5                 | 3.1                                       | 6.1                              | 3.0  |
| Seattle, WA                      | 11.1                         | 9                 | 3.4                                       | 10.3                             | 4.2  |

\*Smoked cigarettes on one or more of the 30 days preceding the survey. †Rank is based on % current cigarette smoking. ‡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. 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, 2009, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention. *MMWR Morb Mortal Wkly Rep.* Surveillance Summaries 2010;59(SS-5).

American Cancer Society, Surveillance Research, 2011

The stall in the decline in youth smoking since 2003 may be related to increases in tobacco industry expenditures on marketing and promotions, declines in funding for comprehensive tobacco control programs, and a lack of substantial increases in retail cigarette price, due to extensive industry price discounting. A comprehensive strategy that includes evidence-based tobacco control strategies (increased cigarette excise taxes, restrictions on smoking in public places, and counter-advertising campaigns) along with effective implementation of the US Food and Drug Administration regulations, including restrictions on certain forms of tobacco advertising and promotions that appeal to youth, are needed to further reduce youth smoking rates.

### Other Tobacco Products

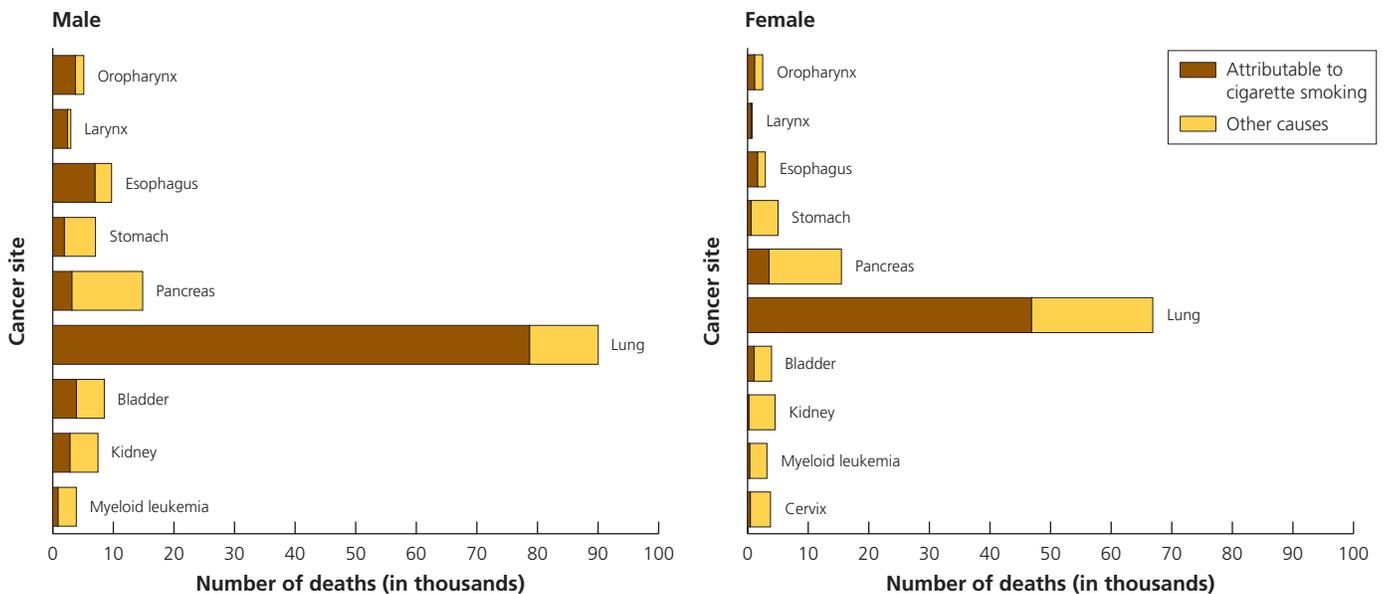
While cigarettes remain the primary tobacco product used by youth, other forms of tobacco use, including cigars, smokeless tobacco products, and hookahs (tobacco water pipes), have grown in popularity. Table 1A provides data from the YRBS on current cigar and smokeless tobacco use among high school students in states and cities/counties for which these data were available for 2009.

- Apart from cigarettes, the most commonly used tobacco products among high school students were cigars (14%) and smokeless tobacco (8.9%).<sup>9</sup> While male and female students were equally likely to smoke cigarettes, males were seven times more likely to use smokeless tobacco and two times more likely to smoke cigars than females.<sup>9</sup>

- Non-Hispanic white and Hispanic/Latino students predominantly smoke cigarettes, while non-Hispanic African Americans are equally likely to smoke cigarettes and cigars.<sup>9</sup>
- YRBS data show that while smokeless tobacco among high school boys declined significantly from 19.2% in 1993 to 11% in 2003, this decline seems to have stalled (2009: 15%). Other national surveys indicate significant increasing trends in current use and initiation among boys in this age group, with the highest concentration in white high school boys (20.1%).<sup>7,9,10</sup> Use among high school girls remains low and has changed little in this time period (1.3% to 2.2%).<sup>9</sup>
- Of the states with data available, cigar use was lowest in Utah (6.8%) and highest in New Mexico (18.1%), whereas smokeless tobacco use was lowest in Hawaii (4.9%) and highest in Wyoming (16.2%) (Table 1A).
- According to the NYTS, about 23.9% of high school students reported current use of any tobacco product.<sup>8</sup> Apart from cigarettes, cigars, and smokeless tobacco, other tobacco products used included pipes (3.9%), kreteks (2.4%), and bidis (2.4%).<sup>8</sup>
- An emerging trend among adolescent and young adult smokers is the use of tobacco water pipes or hookahs. Current use estimates range from 10% to 20% among college students and 10% to 17% among adolescents.<sup>11-13</sup>

Use of tobacco in any form may induce nicotine dependence and harm health. Prevention and cessation programs should address other tobacco products in addition to cigarettes. Apart from

**Figure 1B. Annual Number of Cancer Deaths Attributable to Smoking, Males and Females, by Site, US, 2000-2004**



Source: Centers for Disease Control and Prevention. Smoking-attributable mortality, years of potential life lost, and productivity losses – United States, 2000-2004. *MMWR Morb Mortal Wkly Rep.* 2008;57(45):1226-1228.

American Cancer Society, Surveillance Research, 2011

tobacco control strategies outlined in the following sections, the US Surgeon General recommends that school-based tobacco prevention programs that begin by sixth grade can be an effective part of comprehensive tobacco control programs.<sup>14</sup>

## Adult Tobacco Use

Tobacco use increases the risk of cancers of the lung, mouth, nasal cavities, larynx, pharynx, esophagus, stomach, colorectum, liver, pancreas, kidney, bladder, uterine cervix, ovary (mucinous), and myeloid leukemia.<sup>15,16</sup> The International Agency for Research on Cancer (IARC) recently concluded that there is limited evidence that tobacco smoking causes female breast cancer.<sup>16</sup> Exposure to secondhand smoke increases the risk of lung cancer.<sup>17,18</sup> Thirty percent of cancer deaths, including 87% of lung cancer deaths, can be attributed to tobacco<sup>2,15,18</sup> (Figure 1B, page 5). The overall mortality attributable to smoking varies across states, ranging from 138 per 100,000 population in Utah to 371 per 100,000 population in Kentucky (Table 1C, page 8).

### Current Patterns and Trends in Cigarette Smoking

- According to the National Health Interview Survey (NHIS), an estimated 20.6% of adults (men: 23.5%, women: 17.9%) smoked cigarettes in 2009. About 78% of smokers (36.4 million) used cigarettes daily.<sup>19</sup>
- Between 1997 and 2004, the percentage of adults who smoked decreased from 27.6% to 23.4% in men and from 22.1% to 18.5% in women. Smoking rates were steady between 2004 and 2006, declined in 2007, and remained unchanged between 2007 and 2009.<sup>19</sup>

- The largest disparities in smoking prevalence are by socioeconomic status (SES), race/ethnicity, and state of residence.
- Adults without a high school degree are about three times more likely to be current smokers than those with a college degree (Table 1B).
- The prevalence of smoking among American Indian/Alaska Native adults is the highest among all racial/ethnic groups and is almost twice that of Asian American adults (Table 1B).
- According to the 2009 Behavioral Risk Factor Surveillance System (BRFSS), the rate of smoking in the state with the highest smoking prevalence (Kentucky, 25.7%) is almost three times that of the state with the lowest prevalence (Utah, 9.8%) (Table 1C, page 8).

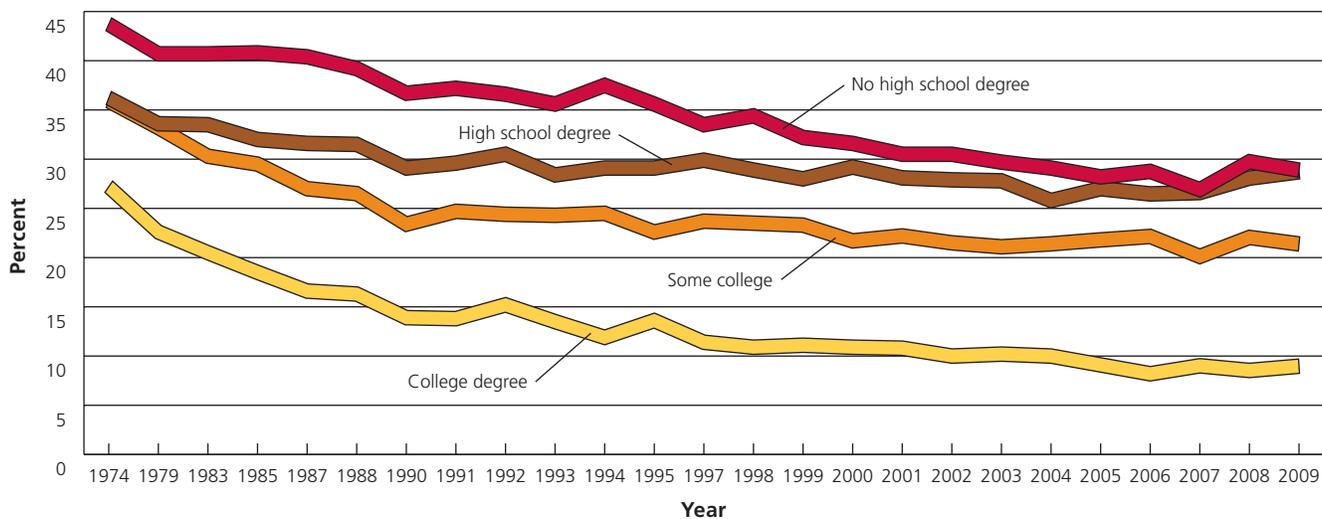
### Other Tobacco Products

Despite evidence that cigars and smokeless tobacco products have substantial health risks, the use of some of these products has continued to increase. Between 2000 and 2007, while cigarette sales decreased by 18%, sales of other tobacco products (in cigarette-pack equivalents), including small cigars, roll-your-own tobacco, and moist snuff, increased by 115%, 91%, and 33%, respectively.<sup>20</sup> This increase in other tobacco product sales offset declines in cigarette sales by approximately 30%.

### Cigar Smoking

- Cigar smoking increases the risk of cancers of the lung, oral cavity, larynx, esophagus, and probably pancreas. Cigar smokers are four to 10 times more likely to die from laryngeal, oral, or esophageal cancers than nonsmokers.<sup>21</sup>

**Figure 1C. Cigarette Smoking Trends\*†, Adults 25 and Older, by Education, US, 1974-2009**



\*Adults 25 and older who have smoked 100 cigarettes in their lifetime and are current smokers (every day or some days). †Estimates are age adjusted to the 2000 US standard population using four age groups: 25-34 years, 35-44 years, 45-64 years, and 65 years and over.

Source: 1974-2007: National Center for Health Statistics, Health, United States, 2007. With Chartbook on Trends in the Health of Americans. Hyattsville, Maryland, 2008. 2008, 2009: National Health Interview Survey Public Use Data Files, National Center for Health Statistics, Centers for Disease Control and Prevention, 2009, 2010.

American Cancer Society, Surveillance Research, 2011

- According to the 2009 National Survey on Drug Use and Health (NSDUH), 5.4% of adults – 9.1% of men, and 1.9% of women aged 18 years and older – had smoked cigars in the past month.<sup>22</sup>
- Young adults 18-25 years (11.4%) have the highest rate of cigar use in the past month compared to those 26 and older (4.4%).<sup>22</sup>
- According to the Tobacco Use Supplements to the Current Population Survey, Alaska had the highest cigar-smoking prevalence (5.4%) and Hawaii had the lowest (2.2%) (Table 1C, page 8).
- Between 1997 and 2007, sales of small cigars (240%) and cigarillos (45%) rose at a much faster rate than sales of large cigars (6%).<sup>23</sup>

Small cigars are similar in shape and size to cigarettes, but are not regulated like cigarettes, making them more appealing to youth. For example, while flavored cigarettes are now banned, there are no such restrictions on small cigars. It is important to regulate and tax small cigars in line with cigarettes in order to pre-empt the tobacco industry from taking advantage of loopholes in current tobacco legislation.

### Smokeless Tobacco

Smokeless tobacco products, including chewing tobacco and snuff, are not safe substitutes for smoking cigarettes or cigars. These products increase the risk of oral, pancreatic, and esophageal cancer, as well as noncancerous oral conditions.<sup>24</sup> Compared to quitting completely, switching to any smokeless product as a substitute for smoking has also been shown to be harmful.<sup>25</sup>

- In 2009, according to data from the NSDUH, 3.5% of adults 18 and older, 7.0% of men, and 0.3% of women used smokeless products in the past month. Young adults (6.1%) were two times more likely to use smokeless products than those 26 years or older (3.1%).<sup>26</sup>
- Whites (4.6%) were more likely to use smokeless tobacco than Hispanic/Latinos (1.1%), Asians (0.5%), or African Americans (1.0%). While data were unavailable for American Indian/Alaska Natives for 2009, the rates of smokeless tobacco use historically have been high among this group (2008: 5.7%).<sup>26</sup>
- According to the 2009 BRFSS, smokeless tobacco use (including snus) was highest among South and North-Central US states, including Wyoming (9.1%), West Virginia (8.5%), and Mississippi (7.5%), and lowest among California (1.3%) and Northeastern states, such as Massachusetts (1.5%) and Rhode Island (1.5%), as well as the District of Columbia (1.5%) (Table 1C, page 8). Male smokeless tobacco use in West Virginia (17.1%) and Wyoming (16.9%) was almost comparable to the national smoking prevalence in 2010.<sup>27</sup>
- Use of cigarettes and smokeless tobacco use rates among states appear to be correlated. Of the states in the top 25% for smoking rates, more than half (7 states) were also in the top 25% for smokeless tobacco use rates (Table 1C, page 8).

**Table 1B. Current Cigarette Smoking\*, Adults 18 and Older, US, 2009**

| Characteristic                             | % Men       | % Women     | % Total     |
|--|-------------|-------------|-------------|
| <b>Age group (years)</b>                   |             |             |             |
| 18 to 24                                   | 28.0        | 15.6        | 21.8        |
| 25 to 44                                   | 26.5        | 21.5        | 24.0        |
| 45 to 64                                   | 24.5        | 19.5        | 21.9        |
| 65 or older                                | 9.5         | 9.5         | 9.5         |
| <b>Race/ethnicity</b>                      |             |             |             |
| White (non-Hispanic)                       | 24.5        | 19.8        | 22.1        |
| African American (non-Hispanic)            | 23.9        | 19.2        | 21.3        |
| Hispanic/Latino                            | 19.0        | 9.8         | 14.5        |
| American Indian/Alaska Native <sup>†</sup> | 29.7        | N/A         | 23.2        |
| Asian (non-Hispanic) <sup>‡</sup>          | 16.9        | 7.5         | 12.0        |
| <b>Education (years)<sup>§</sup></b>       |             |             |             |
| 8 or fewer                                 | 22.2        | 11.9        | 17.1        |
| 9 to 11                                    | 36.5        | 30.5        | 33.6        |
| 12 (no diploma)                            | 34.1        | 23.3        | 28.5        |
| GED diploma <sup>¶</sup>                   | 53.2        | 44.7        | 49.1        |
| High school graduate                       | 29.0        | 21.5        | 25.1        |
| Some college (no degree)                   | 26.1        | 21.0        | 23.3        |
| Associate degree                           | 20.6        | 19.1        | 19.7        |
| Undergraduate degree                       | 12.4        | 9.9         | 11.1        |
| Graduate degree                            | 4.9         | 6.3         | 5.6         |
| <b>Health insurance coverage</b>           |             |             |             |
| Uninsured                                  | 37.8        | 27.2        | 33.1        |
| Insured                                    | 19.7        | 16.2        | 17.9        |
| <b>Total</b>                               | <b>23.5</b> | <b>17.9</b> | <b>20.6</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 years or older. ¶General Educational Development. Note: N/A: Not available due to insufficient sample size.

**Source:** National Health Interview Survey, 2009, National Center for Chronic Disease Prevention and Health Promotion, 2010. Centers for Disease Control and Prevention. Vital Signs: Current Cigarette Smoking Among Adults Aged ≥18 Years – United States, 2009. *MMWR Morb Mortal Wkly Rep.* 2010;59(35):1135-1140.

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- The use of both cigarettes and smokeless tobacco products (chewing tobacco, snuff and snus) ranged from 13.7% in Wyoming to 2.9% in Delaware.<sup>27</sup>

The tobacco industry continues to market smokeless products as supplemental sources of nicotine in smoke-free settings or misleadingly as a low-risk option for smokers who are unable to quit.<sup>28-30</sup> Among the new products introduced by the tobacco industry in the US is snus, a “spitless,” moist powder tobacco pouch placed between the user’s cheek and gum. In addition to snus, R.J. Reynolds in early 2009 began test marketing new, dissolvable tobacco products called Camel Orbs, Camel Strips, and Camel Sticks in Portland, Oregon; Columbus, Ohio; and Indianapolis, Indiana. These products are especially troubling

**Table 1C. Smoking Attributable Mortality Rate 2000-2004, and Tobacco Use, Adults, by State, US, 2006-2007, 2009**

|                      | 2000-2004                            | 2009         |                   |                  |                    | 2006-2007                  | 2009                                 |  |
|----------------------|--------------------------------------|--------------|-------------------|------------------|--------------------|----------------------------|--------------------------------------|--|
|                      | Smoking attributable mortality rate* | 18 and older | Rank <sup>†</sup> | Men 18 and older | Women 18 and older | Low education <sup>§</sup> | % Current cigar use <sup>¶</sup> (%) | % Current smokeless tobacco use <sup>#</sup> (%) |
| Alabama              | 318                                  | 22.6         | 45                | 25.7             | 19.7               | 33.7                       | 2.9                                  | 6.6  |
| Alaska               | 270                                  | 20.5         | 40                | 20.8             | 20.2               | 47.2                       | 5.4                                  | 5.8  |
| Arizona              | 247                                  | 16.2         | 12                | 18.2             | 14.4               | 29.2                       | 3.2                                  | 3.1  |
| Arkansas             | 324                                  | 21.5         | 41                | 21.0             | 22.0               | 31.0                       | 4.1                                  | 7.4  |
| California           | 235                                  | 12.9         | 2                 | 15.6             | 10.2               | 14.8                       | 2.9                                  | 1.3  |
| Colorado             | 238                                  | 17.1         | 17                | 19.5             | 14.7               | 24.2                       | 3.3                                  | 3.9  |
| Connecticut          | 238                                  | 15.5         | 9                 | 16.3             | 14.8               | 24.3                       | 3.7                                  | 1.6  |
| Delaware             | 281                                  | 18.4         | 29                | 20.3             | 16.7               | 31.6                       | 2.5                                  | 1.9  |
| District of Columbia | 250                                  | 15.3         | 7                 | 15.8             | 14.9               | 32.9                       | 4.6                                  | 1.5  |
| Florida              | 259                                  | 18.2         | 28                | 19.5             | 16.9               | 34.6                       | 3.2                                  | 3.2  |
| Georgia              | 299                                  | 17.7         | 22                | 20.1             | 15.6               | 29.0                       | 3.2                                  | 4.7  |
| Hawaii               | 168                                  | 15.3         | 8                 | 16.8             | 13.8               | 29.4                       | 2.2                                  | 2.6  |
| Idaho                | 237                                  | 16.3         | 13                | 18.8             | 13.9               | 32.2                       | 3.3                                  | 5.7  |
| Illinois             | 263                                  | 18.6         | 31                | 20.7             | 16.7               | 29.7                       | 3.3                                  | 3.2  |
| Indiana              | 309                                  | 23.2         | 47                | 24.9             | 21.5               | 41.6                       | 3.4                                  | 4.6  |
| Iowa                 | 248                                  | 17.2         | 18                | 19.6             | 14.8               | 24.3                       | 4.4                                  | 4.5  |
| Kansas               | 263                                  | 17.8         | 23                | 18.6             | 17.1               | 36.9                       | 4.5                                  | 5.9  |
| Kentucky             | 371                                  | 25.7         | 51                | 27.3             | 24.2               | 41.5                       | 4.1                                  | 6.7  |
| Louisiana            | 300                                  | 22.1         | 43                | 25.0             | 19.4               | 35.4                       | 2.8                                  | 3.9  |
| Maine                | 290                                  | 17.3         | 20                | 18.9             | 15.9               | 37.3                       | 4.0                                  | 2.3  |
| Maryland             | 262                                  | 15.3         | 6                 | 16.8             | 13.8               | 31.9                       | 3.5                                  | 1.7  |
| Massachusetts        | 249                                  | 15.0         | 4                 | 16.1             | 14.0               | 27.5                       | 2.7                                  | 1.5  |
| Michigan             | 282                                  | 19.6         | 34                | 21.1             | 18.3               | 36.8                       | 4.1                                  | 3.5  |
| Minnesota            | 215                                  | 16.8         | 15                | 18.6             | 14.9               | 32.5                       | 4.4                                  | 3.9  |
| Mississippi          | 334                                  | 23.4         | 48                | 27.2             | 19.9               | 35.3                       | 3.8                                  | 7.5  |
| Missouri             | 308                                  | 23.1         | 46                | 24.4             | 21.9               | 37.7                       | 4.0                                  | 5.4  |
| Montana              | 276                                  | 16.9         | 16                | 16.4             | 17.3               | 40.3                       | 4.0                                  | 7.4  |
| Nebraska             | 236                                  | 16.7         | 14                | 18.4             | 15.1               | 28.8                       | 3.9                                  | 4.7  |
| Nevada               | 344                                  | 22.1         | 42                | 22.7             | 21.4               | 39.0                       | 2.8                                  | 3.3  |
| New Hampshire        | 272                                  | 15.8         | 10                | 17.3             | 14.4               | 38.1                       | 3.7                                  | 2.6  |
| New Jersey           | 240                                  | 15.9         | 11                | 17.7             | 14.3               | 22.0                       | 3.3                                  | 2.3  |
| New Mexico           | 234                                  | 17.9         | 25                | 19.9             | 16.1               | 26.6                       | 3.9                                  | 4.2  |
| New York             | 246                                  | 18.1         | 27                | 19.3             | 16.9               | 24.0                       | 2.8                                  | 2.0  |
| North Carolina       | 298                                  | 20.4         | 39                | 23.2             | 17.8               | 28.7                       | 3.1                                  | 4.3  |
| North Dakota         | 226                                  | 18.6         | 30                | 19.3             | 17.8               | 27.4                       | 3.1                                  | 6.6  |
| Ohio                 | 299                                  | 20.4         | 38                | 21.2             | 19.5               | 42.0                       | 4.5                                  | 4.1  |
| Oklahoma             | 332                                  | 25.5         | 49                | 27.1             | 23.9               | 39.0                       | 3.5                                  | 7.3  |
| Oregon               | 263                                  | 17.9         | 24                | 18.6             | 17.3               | 40.0                       | 3.3                                  | 3.9  |
| Pennsylvania         | 259                                  | 20.2         | 36                | 21.4             | 19.2               | 33.4                       | 4.0                                  | 5.0  |
| Rhode Island         | 267                                  | 15.2         | 5                 | 15.3             | 15.0               | 25.6                       | 4.1                                  | 1.5  |
| South Carolina       | 293                                  | 20.3         | 37                | 21.5             | 19.2               | 38.3                       | 3.4                                  | 4.7  |
| South Dakota         | 239                                  | 17.5         | 21                | 16.9             | 18.1               | 25.7                       | 3.0                                  | 6.2  |
| Tennessee            | 325                                  | 22.1         | 44                | 24.7             | 19.7               | 41.1                       | 3.5                                  | 4.9  |
| Texas                | 273                                  | 18.0         | 26                | 22.2             | 13.8               | 19.9                       | 3.5                                  | 3.8  |
| Utah                 | 138                                  | 9.8          | 1                 | 11.9             | 7.7                | 25.7                       | 2.4                                  | 2.7  |
| Vermont              | 248                                  | 17.2         | 19                | 19.5             | 15.0               | 28.3                       | 3.7                                  | 3.6  |
| Virginia             | 267                                  | 19.2         | 33                | 22.7             | 15.9               | 35.0                       | 3.5                                  | 4.6  |
| Washington           | 261                                  | 15.0         | 3                 | 16.1             | 13.8               | 27.6                       | 3.7                                  | 3.7  |
| West Virginia        | 344                                  | 25.6         | 50                | 27.7             | 23.7               | 38.7                       | 2.6                                  | 8.5  |
| Wisconsin            | 244                                  | 18.8         | 32                | 20.3             | 17.3               | 28.7                       | 3.6                                  | 3.7  |
| Wyoming              | 283                                  | 19.9         | 35                | 20.2             | 19.7               | 35.8                       | 3.8                                  | 9.1  |
| United States**      | 263                                  | 18.2         |                   | 20.1             | 16.3               | 27.2                       | 3.9                                  | 3.6  |
| Range                | 138-371                              | 9.8-25.7     |                   | 11.9-27.7        | 7.7-24.2           | 14.8-47.2                  | 2.2-5.4                              | 1.3-9.1  |

\*Number of deaths attributable to cigarette smoking (not including burn or secondhand smoke deaths) divided by the population aged 35 years and older, multiplied by 100,000, adjusted to a standardized age distribution to allow comparison across states. †Smoked 100 cigarettes in their entire lifetime and are current smokers (regular and irregular). ‡Rank is based on % 18 and older. §Adults 25 and older with less than a high school education. ¶Used a cigar even one time and are current users (some days or every day). #Reported currently using chewing tobacco, snuff, or snus (a small pouch of smokeless tobacco) every day or some days. \*\*See statistical notes for definition; Smoking attributable mortality rate: US estimate represents the median rate.

**Source:** Smoking attributable mortality rate: Smoking-Attributable Mortality, Morbidity, and Economic Costs (SAMMEC). Centers for Disease Control and Prevention, 2010. Current smoking and Smokeless Tobacco Use: Behavioral Risk Factor Surveillance System 2009, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2010. Cigar use: National Cancer Institute and Centers for Disease Control and Prevention Co-sponsored Tobacco Use Supplement to the Current Population Survey (2006-07), US Department of Commerce, Census Bureau (2008).

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because of their appeal to children – they look and dissolve like candy; the packaging is brightly colored and resembles the size and shape of mint tins or cellphones; and the use and packaging of the products are easily concealed from teachers and parents. Although such products may be perceived as having lower risk, they may provide a gateway to smoking among nonsmokers, especially children, and may increase overall tobacco use by encouraging dual use of cigarettes and other tobacco products.<sup>31,32</sup> The products also may discourage use of evidence-based cessation therapies among those who want to quit. Therefore, the new regulatory powers of the US Food and Drug Administration will be an important element in limiting the use of these products. (See page 10.)

## Comprehensive Tobacco Control Programs

Comprehensive tobacco control programs aim to reduce tobacco use, and, thereby tobacco-related disease, disability, and death, by applying an optimal mix of evidence-based economic, policy, regulatory, educational, social, and clinical strategies.<sup>14,33</sup> Interventions that effectively reduce tobacco use include increases in excise taxes, restrictions on smoking in public places, prevention and cessation programs, and effective anti-tobacco media campaigns.<sup>14</sup>

According to the Centers for Disease Control and Prevention (CDC) Best Practices for Comprehensive Tobacco Control Programs<sup>33</sup>, effective state-based comprehensive tobacco control programs must include the following components:

- State and community interventions (e.g., support of tobacco prevention and control coalitions; implementation of evidence-based policy interventions to reduce overall tobacco use, funding of community-based organizations; and development of community coalitions to strengthen partnerships between local agencies, grassroots, and voluntary and civic organizations)
- Health communication interventions (e.g., audience research to develop high-impact campaigns, market research to motivate behavior change, and marketing surveillance to counter tobacco messaging)
- Cessation interventions (e.g., increase of services available through population-based cessation programs, public and private insurance coverage of evidence-based tobacco treatments, and elimination of cost barriers for underserved populations, including the uninsured)
- Surveillance and evaluation (e.g., regular monitoring of tobacco-related attitudes, behaviors, and health outcomes; measurement of short-term and intermediate indicators of program effectiveness, including policy changes and changes in social norms; and counter-marketing surveillance)

### *According to the US Surgeon General, the goals of comprehensive tobacco control include:<sup>14</sup>*

- Prevent the initiation of tobacco use among young people.
  - Promote quitting among young people and adults.
  - Eliminate nonsmokers' exposure to secondhand smoke.
  - Identify and eliminate the disparities in tobacco use and its effects among different population groups.
- Administration and management (e.g., strategic planning to guide program efforts, and award and monitor program contracts)

Evidence for these recommendations stems in part from states that have documented the benefits of implementing comprehensive tobacco control programs.<sup>14</sup> For example, California's long-standing comprehensive tobacco control program is associated with a marked drop in adolescent smoking initiation.<sup>34</sup> This program, which included excise tax increases, also resulted in greater reductions in cigarette consumption among daily smokers 35 years or older and cessation rates among adult smokers 35 years or younger than states without comprehensive tobacco control programs, regardless of cigarette prices.<sup>35,36</sup> As a result, these reductions in smoking have led to reductions in tobacco-related cancers. Lung cancer incidence in California has declined more rapidly after the implementation of its comprehensive tobacco control program than would have been predicted from prior trends in the state.<sup>37</sup> Additionally, the California program's estimated impact in reducing personal health care expenditures was \$86 billion.<sup>38</sup>

### **Federal initiatives in tobacco control**

While states have been at the forefront of tobacco control efforts, the importance of the federal government's role was emphasized in 2007 by the Institute of Medicine.<sup>39</sup> Some recent federal tobacco control initiatives include:

**Coverage of clinical cessation services:** Provisions in the Affordable Care Act signed into law on March 23, 2010, ensure coverage of evidence-based cessation treatments, including pharmacotherapy and cessation counseling, with no cost-sharing to previously uninsured individuals who will be covered by new plans starting on or after September 23, 2010. Medicare will now cover cessation treatments, including counseling, for all beneficiaries, whereas previously the program only covered treatments for enrollees with tobacco-related illnesses. In addition, the act ensures that, starting this year, Medicaid programs cover cessation therapies without copayment for pregnant women, and starting in 2014, programs can no longer exempt cessation pharmacotherapy from prescription drug coverage.

**Regulation of tobacco products:** The Family Smoking Prevention and Tobacco Control Act of 2009 for the first time granted the US Food and Drug Administration (FDA) the authority to regulate the manufacturing, marketing, and sale of tobacco products.<sup>40</sup> The new law created the Center for Tobacco Products at the FDA and outlined specific implementation dates for several key provisions. To date, fruit and candy flavorings in cigarettes have been banned as are the following marketing practices: use of misleading descriptors such as “light,” “low,” and “mild;” tobacco brand name sponsorship of sports and entertainment events; free tobacco and non-tobacco item giveaways; and sale of cigarettes in packs of less than 20. In addition, the tobacco industry is required to disclose the ingredients of their products to the FDA; new, larger, more effective warning labels are required on smokeless tobacco products; and stores are required to place tobacco products behind counters. In addition, the law grants states and localities the authority to further restrict tobacco industry marketing and promotions, and to require changes to tobacco products, such as the removal of harmful ingredients and reduction of nicotine levels to make them less addictive. In March 2011, the FDA’s Tobacco Products Scientific Advisory Committee found that menthol cigarettes increase youth experimentation and initiation and increase the overall prevalence of smoking among African Americans. The committee also found that the tobacco industry marketed menthol products disproportionately to younger smokers and African Americans. Based on their findings, the committee concluded that the removal of menthol cigarettes from the marketplace would benefit public health in the United States. These findings could provide a scientific basis for the FDA to try to limit, phase out, or even possibly ban menthol in cigarettes, and the FDA will decide how to act on the recommendations.

**Federal tobacco taxes:** In 2009, federal tobacco taxes were increased on cigarettes (from 0.39 to \$1.01) and other tobacco products (cigars, snuff, and chewing, pipe, and roll-your-own). Federal tobacco tax increases will prevent smoking initiation, reduce consumption, and promote quitting. In addition, such increases can also form an important revenue source for federally funded cessation and other tobacco control programs.

**Federal funding:** As part of a federal stimulus legislation called the American Recovery and Reinvestment Act of 2009, the federal government created the Communities Putting Prevention to Work initiative, which made nearly \$373 million in community grants and \$120 million in state and territory grants toward prevention programs over the past year, including evidence-based tobacco control efforts such as tobacco quitlines and media campaigns. Twenty-one communities received a total of \$143 million exclusively focused on tobacco control. Additional funding

was dedicated to this program in 2010 through the Prevention and Public Health Fund, created as part of the Affordable Care Act.

Other initiatives that would bolster the national tobacco control infrastructure include the ratification of the World Health Organization Framework Convention on Tobacco Control (FCTC), a global health treaty developed to curtail the tobacco epidemic.<sup>41</sup>

The American Cancer Society and the American Cancer Society Cancer Action Network<sup>SM</sup> (ACS CAN), the nonprofit, nonpartisan advocacy affiliate of the Society, worked to ensure the passage of many of these federal laws and will continue to work with their public health partners to reduce the burden of tobacco in the US.

## Tobacco Excise Taxes

The price of cigarettes is inversely and predictably related to consumption: A 10% increase in price reduces overall cigarette consumption by 3%-5%.<sup>14</sup> Young people who smoke are up to three times more responsive to price increases than adults.<sup>42</sup> Raising cigarette prices by increasing excise taxes reduces tobacco consumption, especially among children and young adults, and increases cessation among adults.<sup>31</sup> Increased excise taxes also raise governmental revenue, which can be used for tobacco control.<sup>14,39</sup> In addition, cigarette price increases through taxation could potentially reduce socioeconomic status (SES) disparities, given that low-income smokers and certain lower SES occupational groups are more responsive to tax increases than higher SES groups.<sup>43,44</sup>

- Cigarette taxes can be levied at the federal, state, and local levels. There is wide variation in state cigarette excise taxes, ranging from 17 cents per pack in Missouri to \$4.35 per pack in New York (Table 1D).
- Currently, five states (New York, Rhode Island, Washington, Connecticut, and Hawaii) and Guam have cigarette tax rates of \$3 or more; 14 states, the District of Columbia, and Guam have tax rates of \$2 or more per pack; and 29 states, the District of Columbia, Puerto Rico, the Northern Mariana Islands, and Guam have tax rates of \$1 or more per pack.<sup>45</sup> States that have tax rates of less than \$1 per pack of cigarettes are mostly concentrated in the Southeast and central US, and include several tobacco-growing states. (See cover, Table 1D.)
- Although 47 states and the District of Columbia have increased their cigarette taxes since 2002, only 24 states have laws requiring that a portion of their excise taxes be dedicated to health, cancer control, or tobacco control programs (Table 1D).<sup>45,46</sup>
- With the exception of Pennsylvania, all states tax non-cigarette tobacco products to some extent. Florida does not tax cigars, but taxes other tobacco products.<sup>47</sup>

**Table 1D. Comprehensive Tobacco Control Measures, by State, US, 2011**

|                      | Cigarette tax per pack(\$)* | 100% smoke-free laws in workplaces and/or restaurants and/or bars† | Fiscal year per capita tobacco control funding (\$) | Tobacco control funding as a % of tobacco revenue‡ |
|----------------------|-----------------------------|--|---|--|
| Alabama              | 0.425                       |  | 0.2   | 0.4  |
| Alaska               | 2.00†                       |  | 13.8  | 9.8  |
| Arizona              | 2.00†                       | W, R, B  | 3.1   | 4.5  |
| Arkansas             | 1.15†                       |  | 4.0   | 4.2  |
| California           | 0.87†                       | R, B   | 2.0   | 4.5  |
| Colorado             | 0.84†                       | R, B   | 1.4   | 2.4  |
| Connecticut          | 3.00                        | R, B   | 0.1   | 0.1  |
| Delaware             | 1.60                        | W, R, B  | 9.2   | 5.2  |
| District of Columbia | 2.50                        | W, R, B  | 1.0   | 0.8  |
| Florida              | 1.339†                      | W, R   | 3.3   | 3.9  |
| Georgia              | 0.37                        |  | 0.2   | 0.6  |
| Hawaii               | 3.00†                       | W, R, B  | 6.8   | 5.2  |
| Idaho                | 0.57†                       | R  | 1.0   | 2.1  |
| Illinois             | 0.98                        | W, R, B  | 0.7   | 1.1  |
| Indiana              | 0.995†                      |  | 1.4   | 1.5  |
| Iowa                 | 1.36†                       | W, R, B  | 2.4   | 2.5  |
| Kansas               | 0.79                        | W, R, B  | 0.4   | 0.6  |
| Kentucky             | 0.60†                       |  | 0.6   | 0.7  |
| Louisiana            | 0.36†                       | W, R   | 2.0   | 3.1  |
| Maine                | 2.00                        | W, R, B  | 7.5   | 5.1  |
| Maryland             | 2.00                        | W, R, B  | 0.7   | 0.8  |
| Massachusetts        | 2.51                        | W, R, B  | 0.7   | 0.5  |
| Michigan             | 2.00†                       | W, R, B  | 0.3   | 0.2  |
| Minnesota            | 1.576†                      | W, R, B  | 3.7   | 3.4  |
| Mississippi          | 0.68                        |  | 3.3   | 3.7  |
| Missouri             | 0.17                        |  | 0.0   | 0.0  |
| Montana              | 1.70                        | W, R, B  | 8.5   | 6.9  |
| Nebraska             | 0.64†                       | W, R, B  | 1.6   | 2.7  |
| Nevada               | 0.80                        | W, R   | 0.0   | 0.0  |
| New Hampshire        | 1.78                        | R, B   | 0.0   | 0.0  |
| New Jersey           | 2.70†                       | W, R, B  | 0.1   | 0.1  |
| New Mexico           | 1.66†                       | R, B   | 3.4   | 5.4  |
| New York             | 4.35†                       | W, R, B  | 3.0   | 2.6  |
| North Carolina       | 0.45†                       | R, B   | 1.9   | 4.3  |
| North Dakota         | 0.44                        | W  | 12.2  | 14.6   |
| Ohio                 | 1.25                        | W, R, B  | 0.0   | 0.0  |
| Oklahoma             | 1.03†                       |  | 5.8   | 5.7  |
| Oregon               | 1.18†                       | W, R, B  | 1.9   | 2.3  |
| Pennsylvania         | 1.60                        | W  | 1.2   | 1.0  |
| Rhode Island         | 3.46                        | W, R, B  | 0.7   | 0.4  |
| South Carolina       | 0.57†                       |  | 1.1   | 2.1  |
| South Dakota         | 1.53†                       | W, R, B  | 4.3   | 4.0  |
| Tennessee            | 0.62                        |  | 0.0   | 0.1  |
| Texas                | 1.41                        |  | 0.5   | 0.6  |
| Utah                 | 1.70†                       | W, R, B  | 2.6   | 4.9  |
| Vermont              | 2.24                        | W, R, B  | 7.2   | 4.4  |
| Virginia             | 0.30                        |  | 1.2   | 3.2  |
| Washington           | 3.025                       | W, R, B  | 2.0   | 2.3  |
| West Virginia        | 0.55                        |  | 3.1   | 3.1  |
| Wisconsin            | 2.52                        | W, R, B  | 1.2   | 0.8  |
| Wyoming              | 0.60                        |  | 9.6   | 11.7   |
| United States¶       | 1.45                        |  | 2.8   | 2.0  |
| Range                | 0.17-4.35                   |  | 0.0-13.8  | 0-14.6   |

Note: W-workplaces, R-restaurants, B-bars. \*Taxes in effect or increases passed, reported as of March 2011. †States with laws that require a portion of cigarette excise tax revenues be dedicated to cancer- or tobacco-control programs. ‡Smoke-free laws passed or implemented, reported as of April 2011. §Tobacco revenue is the projected collections from tobacco taxes and payments to states from the Master Settlement Agreement with the tobacco companies. ¶See Statistical Notes for definition of prevalence measures; average value (including District of Columbia) for taxes and per capita funding.

**Source:** Cigarette Taxes: American Cancer Society Cancer Action Network, 2011. Campaign for Tobacco-Free Kids, et al. State cigarette excise tax rates and rankings. National Center for Tobacco-Free Kids, 2010. Dedicated excise tax: National Cancer Institute. State Cancer Legislative Database Factsheet: Tobacco Product Excise Taxes, Bethesda, MD:SCLD, 2011. 100% Smoke-free laws: American Nonsmokers' Rights Foundation. Overview List – How Many Smokefree Laws? 2011. Tobacco control funding: A Broken Promise to Our Children: The 1998 State Tobacco Settlement Twelve Years Later, 2010. Per capita funding is calculated by dividing state prevention funding by 2010 US Census state population counts (census.gov).

American Cancer Society, Surveillance Research, 2011

- Non-cigarette tobacco products are taxed either as a percent of wholesale or retail price (recommended method) or based on weight. The average among states that tax moist snuff as a percentage of price is 35%, with the highest rates in Wisconsin (100%), Washington (95%), Vermont (92%), Massachusetts (90%), Rhode Island (80%), Maine (78%), and Alaska (75%) and the lowest in South Carolina (5%), Tennessee (6.6%), and West Virginia (7%).<sup>47</sup>

Even though state excise taxes have risen in the past few decades, in 2006 tobacco companies devoted approximately 92% of their marketing expenditures, or about \$11.8 billion, on strategies to buffer price-sensitive smokers from the shock of price increases, including cigarette-price discounts, promotional allowances to retailers or wholesalers, coupons and retail value-added promotions and others.<sup>48</sup> Excise tax increases should be conjoined with state and federally funded efforts to provide evidence-based cessation services to low SES smokers given that these groups may have fewer opportunities to access effective tobacco-dependence treatments in order to quit.<sup>39,49</sup>

### Smoke-free Initiatives to Reduce Exposure to Secondhand Smoke

Exposure to secondhand smoke increases the risk of lung cancer, coronary artery disease, and heart attacks.<sup>17,18,50</sup> As such, smoke-free initiatives (also referred to as clean indoor air laws or ordinances), implemented at the state or local level, are an important component of comprehensive tobacco control. Comprehensive smoking bans reduce exposure to secondhand smoke (SHS). Nationally, exposure to SHS among nonsmokers, as measured by detectable levels of cotinine (a metabolite of nicotine), declined from 84% in 1988-1994 to 46% in 1999-2004, a likely reflection of widespread implementation of smoke-free laws and reductions in smoking prevalence.<sup>51</sup> In the past decade, the largest decline in SHS exposure among nonsmokers occurred between 1999-2000 (52.5%) and 2001-2002 (41.7%), with estimates since that time remaining relatively unchanged (2007-2008: 40.1%).<sup>52</sup>

#### State and local smoke-free legislation

- Reflecting the current success of smoke-free legislation, 79.4% of the US population is covered by a 100% smoke-free provision in workplaces, and/or restaurants, and/or bars.<sup>54</sup>
- Seventy-five percent of indoor workers had a smoke-free policy in their workplace in 2006-2007, compared to 46.1% in 1992-1993.<sup>55</sup>
- There are 3,270 municipalities in the country with some form of local smoke-free legislation. Currently, 454 municipalities have local laws to establish 100% smoke-free workplaces, restaurants, and bars.<sup>54</sup>
- Thirty-five states, the District of Columbia, the Northern Mariana Islands, Puerto Rico, American Samoa, and the US Virgin Islands have enacted statewide smoking bans that

### Effectiveness of Smoke-free Laws

Smoke-free laws are effective in reducing secondhand smoke exposure, modifying smoking behavior, and reducing disease risk.<sup>50,53</sup> According to a recent landmark report by the International Agency for Research on Cancer (IARC)<sup>53</sup>:

#### *There is sufficient\* evidence that:*

- The implementation of smoke-free policies substantially decreases secondhand smoke exposure.
- Smoke-free workplaces decrease cigarette consumption in continuing smokers.
- Smoke-free policies do not decrease business activity of the restaurant and bar industry.
- The introduction of smoke-free policies decreases respiratory symptoms in workers.
- Voluntary smoke-free home policies decrease children's secondhand smoke exposure.
- Smoke-free home policies decrease adult smoking.

#### *There is strong† evidence suggesting that:*

- Smoke-free workplaces decrease the prevalence of adult smoking.
- Smoke-free policies decrease tobacco use in youths.
- The introduction of smoke-free legislation decreases heart disease morbidity.
- Smoke-free home policies decrease smoking in youths.

\* Sufficient evidence indicates that the association was judged to be causal.

† Strong evidence indicates that the evidence of the association is consistent, but evidence of causality is limited.

prohibit smoking in workplaces, and/or restaurants, and/or bars.<sup>54</sup> Twenty-three of these states, the District of Columbia, Puerto Rico, and the US Virgin Islands provide comprehensive smoke-free protection, meaning that all workplaces, restaurants, and bars are 100% smoke free (Table 1D, page 11).<sup>54</sup> Several other states have had success enacting limited forms of smoke-free legislation.

- Seventeen states, Puerto Rico, and the Virgin Islands have enacted 100% smoke-free laws for all state-regulated gaming facilities.<sup>54</sup>
- Fourteen states have enacted either partial or complete preemption laws that prohibit local governments from enacting smoke-free air laws.<sup>56</sup>

Despite tremendous progress in reducing population exposure to secondhand smoke, disparities exist. Declines in exposure to secondhand smoke since the late 1980s have been twice as large among non-Hispanic whites, compared to non-Hispanic African Americans.<sup>51</sup> In the past decade, however, African Americans have experienced larger declines in exposure to SHS, compared

to whites, but still have significantly higher rates.<sup>52</sup> As a result of strong opposition to smoke-free policies in hospitality and gaming facilities (including most tribally owned casinos and bars), some occupational groups are still exposed to SHS. These disparities underscore the need for comprehensive smoke-free legislation that covers all segments of society.

### Countering Tobacco Industry Marketing

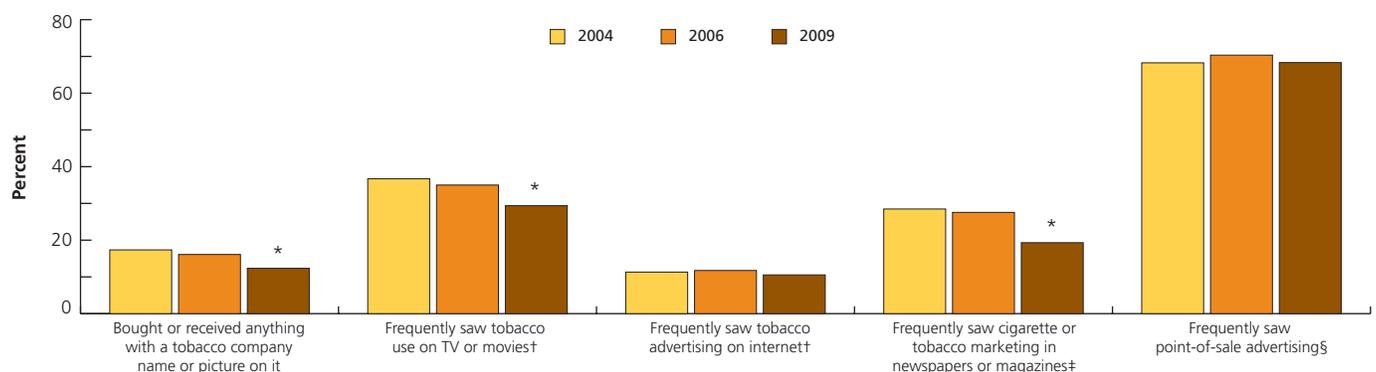
Exposure to tobacco industry marketing (advertising and promotions) significantly increases the likelihood that adolescents initiate and continue tobacco use and increases per-capita cigarette consumption in the general population.<sup>57</sup> In 2006, the tobacco industry spent \$12.49 billion on cigarette marketing and \$354.1 million on smokeless tobacco marketing, up from \$250.8 million in 2005.<sup>48</sup> Price discounts in 2006 made up 58% of all smokeless marketing expenditures and increased by 104% from 2005.<sup>48</sup>

Tobacco industry marketing is targeted toward youth in a variety of ways. Between 2004 and 2009, US middle and high school students reported either declined or unchanged exposure to select marketing tactics (Figure 1D). Declining reports of frequent exposure to tobacco use in movies or on TV are corroborated by other studies measuring smoking incidents in movies.<sup>58</sup> These declines may be related to increased advocacy and awareness regarding the public health impact of smoking in the movies on youth smoking initiation, and subsequent changes in movie rating schemes and adoption of internal monitoring by movie studios to reduce smoking content in movies.<sup>58</sup> In contrast, reports of declining frequent exposure to ads for tobacco products in newspapers and magazines most probably reflect the documented shift in industry marketing expenditures from traditional advertising venues toward promotional tactics (e.g., point-of-sale advertising) that circumvent tobacco tax increases.<sup>57</sup>

As traditional avenues of tobacco marketing become more restrictive, the industry is moving toward new venues frequented by youth and young adults to promote their products. Retail tobacco marketing, including point-of-sale and retail promotional allowances, is highly prevalent and has been identified as a strong risk factor for youth smoking initiation.<sup>59</sup> Internet advertising on company Web sites, the World Wide Web or direct advertising through email, and viral or stealth advertising, represent new avenues for tobacco advertising being pursued by the industry. The focus on these venues by the industry is reflected in reports of frequent exposure to point-of-sale and Internet advertising that did not change between 2004 and 2009. There is a need for comprehensive restrictions on existing and emerging tobacco marketing and effective implementation of FDA restrictions on marketing to youths. (See page 10.)

Tobacco industry marketing tactics can be countered with sustained implementation of effective mass media campaigns that highlight the negative consequences of tobacco use and expose the industry's deceptive marketing and promotional tactics.<sup>57</sup> The Florida "truth" antismoking campaign and the nationwide "truth" campaign developed messages that countered the perception of smoking as cool and rebellious by highlighting the tobacco industry's deceptive practices.<sup>57</sup> Antismoking media campaigns can reduce tobacco use by reducing smoking initiation among youth and promoting adult cessation.<sup>57</sup> States that have combined mass media campaigns with other anti-tobacco activities have seen rapid declines in youth and adult smoking prevalence.<sup>57,60</sup> On the other hand, tobacco industry media campaigns that purport to discourage youth smoking have been shown to be ineffective in deterring youth smoking and may in fact have a counterproductive effect.<sup>61</sup> In addition, the tobacco industry has challenged the marketing restrictions in the Family Smoking Prevention and Tobacco Control Act of 2009 in court.

**Figure 1D. Trends in Exposure to Tobacco Marketing, Middle and High School Students, US, 2004-2009**



\*Estimate for 2009 is significantly different ( $p < 0.05$ ) from estimate for 2006 and 2004. †Respondents who reported "most of the time" seeing actors using tobacco on TV or movies. Respondents who reported "most of the time" seeing ads for tobacco products on the Internet. ‡Respondents who reported "all of the time" or "most of the time" seeing ads or promotions for cigarettes and other tobacco products in newspapers or magazines. §Respondents who reported "all of the time" or "most of the time" seeing ads for cigarettes or other tobacco products that have company names or pictures on them in convenience stores, supermarkets, or gas stations.

Source: National Youth Tobacco Surveys, 2004, 2006, 2009. Office on Smoking and Health, Centers for Disease Control and Prevention, 2010.

American Cancer Society, Surveillance Research, 2011



## Tobacco Cessation

### Youth Tobacco Cessation

The opportunity to prevent diseases caused by smoking is greatest when smokers quit early.<sup>62</sup> Adolescents often underestimate the strength and rapidity of tobacco dependence and generally overestimate their ability to quit smoking.<sup>5,63</sup> Most young smokers want to quit smoking and have tried to quit. In 2009, 52.7% of middle and high school smokers made a quit attempt, but only 13% were successful at staying off cigarettes for 6 months or more.<sup>64</sup>

The US Public Health Service (USPHS) updated its clinical practices guideline for tobacco dependence in 2008 and determined that counseling increases tobacco cessation among adolescent smokers.<sup>65</sup> Although nicotine replacement medications appear to be safe in adolescents, there is little evidence that these medications are effective in promoting long-term abstinence among adolescent smokers, and as a result they are not recommended as a component of pediatric tobacco use interventions.<sup>65</sup> More research is needed on the effectiveness of tobacco dependence treatments among young smokers. Youth cessation resources can be found at [youthtobaccocessation.org/index.html](http://youthtobaccocessation.org/index.html) or at [cdc.gov/tobacco/quit\\_smoking/cessation/youth\\_tobacco\\_cessation](http://cdc.gov/tobacco/quit_smoking/cessation/youth_tobacco_cessation).

### Adult Tobacco Cessation

Much of the risk of premature death from smoking could be prevented by smoking cessation. Smokers who quit can expect to live as many as 10 years longer than those who continue to smoke.<sup>15,66</sup> One study showed that those who quit smoking at age 60, 50, 40, or 30 gained about three, six, nine, or 10 years of life expectancy, respectively.<sup>66</sup>

- Smoking cessation in the US, which is measured as the proportion of ever smokers who are former smokers, changed little between 1998 (48.7%) and 2009 (51.7%). Adults with lower levels of education, including GED graduates and those with a high school degree or less, had lower rates of cessation, while those with graduate or undergraduate degrees had the highest rates.<sup>67</sup>
- According to the 2009 BRFSS, in 46 states and the District of Columbia, the majority of adults (50% or more) who ever smoked have now quit.<sup>68</sup>
- According to the 2009 NHIS, of the 46.6 million Americans who smoke, 46% reported having attempted to quit for at least one day in the past year.

Tobacco dependence is a chronic disease and should be treated with effective treatments that can double or triple smokers' chances of long-term abstinence.<sup>65</sup> According to the latest USPHS guideline, these treatments include nicotine replacement treatment (NRT) products, prescription medications, or combinations of these medications and counseling (individual, group, or telephone).<sup>65</sup> The combined use of counseling and medication can be more effective than the use of any individual treatments.

Even with such interventions, multiple attempts may be necessary before long-term quitting is achieved. Thus, it is critical for health care providers to continue to discuss tobacco cessation with their patients even if they have tried to quit and failed in the past. Health care providers can be especially effective in delivering cessation services. The USPHS recommends that clinicians follow the "5 A" model in treating smokers who are willing to quit: *Ask* a patient about their smoking status; *advise* to quit; *assess* for willingness to quit; *assist* in quitting; and *arrange* for a follow-up visit. Even among smokers unwilling to quit, the USPHS recommends brief motivational interventions that can increase attempts to quit.<sup>65</sup> Other strategies that institutionalize cessation services may promote the use of treatment by patients in health care systems; these may include training health care providers to deliver effective treatments and integrating cessation outcomes into overall health quality standards and ratings.<sup>65</sup>

Nationally, the receipt and use of recommended cessation services remains low. In 2005, about 61% of smokers reported being advised by a physician to quit in the past year, and about 35% of smokers tried to quit using recommended tobacco dependence treatments, including pharmacotherapy and/or counseling.<sup>69</sup> The delivery and use of cessation services are strongly related to race/ethnicity and SES. Hispanic and African American smokers are significantly less likely to receive cessation services, compared to non-Hispanic whites and even within race and ethnic groups, insurance coverage and cost remain major barriers. However, even insured smokers may not have access to cessation services. In some cases, coverage is extended only to certain groups of smokers. Insured smokers may bear a significant portion of the cost of pharmacotherapy because of deductibles and co-payments,

or in some cases because certain treatments are not covered at all.<sup>70,71</sup> However, provisions in the Affordable Care Act ensuring coverage of evidence-based cessation treatments may mitigate some of these costs (see page 9).

- In 2009, Medicaid programs in 38 states offered coverage of one or more treatments for tobacco dependence (medication or counseling) for all recipients, 47 states offered coverage of one or more treatments for some recipients, and four states (Connecticut, Georgia, Missouri, and Tennessee) did not offer coverage for any tobacco dependence treatment.
- Five states (Indiana, Massachusetts, Minnesota, Montana, and Pennsylvania) offered comprehensive coverage for all effective medication and counseling treatments.<sup>72</sup>
- Tobacco dependence treatment coverage offered by state Medicaid programs varies within states based on whether recipients are enrolled in fee-for-service plans or in state-contracted managed-care organizations. Sixteen states offer treatment options for fee-for-service enrollees that are different from those offered to managed-care organization enrollees.<sup>72</sup>
- According to the American Lung Association, in 2010 Colorado, Maryland, New Jersey, New Mexico, North Dakota, Oregon, Rhode Island, and Vermont required a majority of dependence treatments to be covered in all private health plans. Vermont requires coverage of all 7 FDA-approved cessation medications.<sup>73</sup>
- In 2010, Illinois, Maine, Nevada, New Mexico, and North Dakota ensured that state employees received comprehensive coverage for all USPHS-recommended medication and counseling treatments, while six states provided coverage for all but two treatments. Thirty-five states provided inadequate coverage, five of which provided no coverage for any pharmacotherapy or counseling.<sup>73</sup>
- By 2008, all 50 states, the District of Columbia, and five territories, offered some degree of telephone cessation counseling.<sup>33,74</sup> However, in 2010, only two states funded cessation quitlines at CDC-recommended levels, while only 11 states reached 50% of recommended funding level.<sup>73</sup>

Another strategy to facilitate cessation is to integrate population-wide cessation services, including physician outreach and education, quit-smoking clinics, and free distribution of nicotine replacement therapy, into comprehensive tobacco control programs. Providing such services in New York City was associated with greater utilization of cessation services and greater quit rates.<sup>75</sup> Recent evidence from Massachusetts suggests that coverage of tobacco cessation treatments with minimal out-of-pocket costs can promote population cessation rates and reduce smoking prevalence. (See sidebar.) In addition, statewide telephone quitlines have a broad reach and can deliver effective behavioral counseling to diverse groups of tobacco users,

including low-income, rural, elderly, uninsured, and racial/ethnic subpopulations of smokers.<sup>65</sup> Recent studies show that integrating standard nicotine replacement therapies into state quitlines can improve quit rates and are cost effective.<sup>76</sup>

The American Cancer Society Quit for Life Program® (1-800-227-2345), currently operated and managed by Alere Wellbeing, has helped more than 1 million tobacco users make a plan to quit completely. The program reaches 400 employers, health plans, and state agencies, with more than 50 million people having access to the program. For more than three decades, the Society has designated the third Thursday in November as the American Cancer Society Great American Smokeout®, a day to raise consciousness about the benefits of stopping smoking and for smokers nationwide to give up cigarettes for at least a day in the hope they might stop smoking completely. (For more information, refer to [cancer.org/docroot/subsite/greatamericans/content/All\\_About\\_Smokeout.asp](http://cancer.org/docroot/subsite/greatamericans/content/All_About_Smokeout.asp) or call 1-800-227-2345.) In addition, a US Department of Health and Human Services Web site ([smokefree.gov](http://smokefree.gov)) offers advice and information on quitting, and a national quitline service (1-800-QUITNOW) provides counseling services.

### Funding for Tobacco Control

Since the Master Settlement Agreement (MSA) with 46 states in 1998, tobacco companies have increased their cigarette advertising and promotional expenditures by 87%, from \$6.7 billion to \$12.49 billion in 2006, and even higher in the intervening years.<sup>48</sup>

#### Coverage of smoking cessation treatments can promote population quit rates and reduce smoking prevalence – Massachusetts

In an effort to reduce the smoking rate among the Medicaid population in Massachusetts, the state legislature as part of overall health care reform in 2006, passed mandates to ensure that smokers in the state Medicaid program (MassHealth) had access to evidence-based cessation treatments. These provisions provided access to two 90-day courses of pharmacotherapy (nicotine replacement therapies and prescription medications) and up to 16 individual or group-counseling sessions, with co-payments as low as \$1 to \$3. A recent evaluation of this benefit showed dramatic declines in smoking prevalence rates and successful quit rates among MassHealth enrollees coinciding with the implementation of the cessation benefit.<sup>77</sup> Smoking prevalence declined by nearly 10 percentage points between the pre- and post-benefit time period (38.3% to 28.3%), with an estimated annual decline of 15%.<sup>77</sup> Massachusetts' experience provides the best evidence to date that comprehensive cessation coverage with minimum cost barriers, when widely promoted, can improve population cessation rates and subsequently reduce smoking rates.



# Overweight and Obesity, Physical Activity, and Nutrition

Obesity, physical inactivity, and poor nutrition are major risk factors for cancer, second only to tobacco use.<sup>83</sup> Approximately one-third of the more than 500,000 cancer deaths in the US this year can be attributed to poor diet and physical inactivity, while another one-third is caused by use of tobacco products. Although genetic inheritance plays a role in the risk of some individuals developing cancer, non-inherited factors have a larger impact on cancer risk for the population as a whole. Avoiding the use of tobacco products and exposure to secondhand smoke, maintaining a healthy weight, staying physically active throughout life, and consuming a healthy diet can substantially reduce a person's lifetime risk of developing cancer (as well as cardiovascular disease).<sup>84</sup>

The American Cancer Society periodically publishes guidelines on nutrition and physical activity for cancer prevention based on a comprehensive evidence-based review.<sup>85</sup> These guidelines contain recommendations regarding individual choices related to weight control, physical activity, and diet, as well as community action to create a physical and social environment that promotes healthy behaviors.

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

### Individual choices

#### *Maintain a healthy weight throughout life.*

- Balance caloric intake with physical activity.
- Avoid excessive weight gain throughout life cycle.
- Achieve and maintain a healthy weight if currently overweight or obese.

#### *Adopt a physically active lifestyle.*

**Adults:** Engage in at least 30 minutes of moderate to vigorous physical activity, above usual activities, on 5 or more days of the week; 45 to 60 minutes of intentional physical activity is preferable.

**Children and adolescents:** Engage in at least 60 minutes per day of moderate to vigorous physical activity at least 5 days per week.

## Individual Choices

The American Cancer Society guidelines for nutrition and physical activity include four recommendations for individual choices that may reduce cancer risk: 1) maintaining a healthy weight throughout life, 2) adopting a physically active lifestyle, 3) consuming a healthy diet, and 4) limiting consumption of alcoholic beverages. (See sidebar.)

### 1. Maintain a healthy weight throughout life.

- Balance caloric intake with physical activity.
- Avoid excessive weight gain throughout life cycle.
- Achieve and maintain a healthy weight if currently overweight or obese.

### Body Weight and Cancer Risk

In the US, overweight and obesity contribute to 14%-20% of all cancer-related deaths. (See sidebar, page 18, for definitions of overweight and obesity.) Overweight and obesity are clearly associated with increased risk for developing many cancers, including cancer of the breast (postmenopausal), colon, endometrium, esophagus, and kidney. In addition, observational studies show that obesity increases the risk for cancers of the pancreas, gallbladder, thyroid, ovary, and cervix, and for multiple myeloma, Hodgkin lymphoma, and aggressive prostate cancer.<sup>86</sup> The link between body weight and cancer risk is believed to stem from multiple effects on fat and sugar metabolism, immune function, level of hormones (including insulin and estradiol),

#### *Consume a healthy diet, with an emphasis on plant sources.*

- Choose foods and beverages in amounts that help achieve and maintain a healthy weight.
- Eat 5 or more servings of a variety of vegetables and fruits each day.
- Choose whole grains in preference to processed (refined) grains.
- Limit consumption of processed and red meats.

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

- Drink no more than 1 drink per day for women or 2 per day for men.

### Community Action

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

## Defining Body Mass Index

For adults, this sidebar relates body mass index (BMI) to pounds and inches. For example, a 5-foot-4-inch 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-foot-10-inch 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† | Extremely Obese‡ |
| 6'4"                     | 205                  | 246    | 328              |
| 6'3"                     | 200                  | 240    | 319              |
| 6'2"                     | 194                  | 233    | 311              |
| 6'1"                     | 189                  | 227    | 302              |
| 6'0"                     | 184                  | 221    | 294              |
| 5'11"                    | 179                  | 215    | 286              |
| 5'10"                    | 174                  | 207    | 278              |
| 5'9"                     | 169                  | 203    | 270              |
| 5'8"                     | 164                  | 197    | 262              |
| 5'7"                     | 159                  | 191    | 255              |
| 5'6"                     | 155                  | 186    | 247              |
| 5'5"                     | 150                  | 180    | 240              |
| 5'4"                     | 145                  | 174    | 232              |
| 5'3"                     | 141                  | 169    | 225              |
| 5'2"                     | 136                  | 164    | 218              |
| 5'1"                     | 132                  | 158    | 211              |
| 5'0"                     | 128                  | 153    | 204              |
| 4'11"                    | 124                  | 148    | 198              |
| 4'10"                    | 119                  | 143    | 191              |

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

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

‡Extreme obesity is defined as BMI of 40 kg/m<sup>2</sup> or greater.

For children two years and older, BMI values are used as a screening tool for determining overweight and obesity and identifying possible weight problems. After a BMI value is calculated for a child based on their weight and height, the BMI number is plotted on the Centers for Disease Control and Prevention's (CDC) BMI for age- and gender-specific growth charts to obtain a percentile ranking.<sup>91</sup> The percentile indicates the relative position of the child's BMI number among children of the same sex and age. According to the CDC definitions, obesity in children is defined as a BMI at or above the sex- and age-specific 95th percentile BMI cutoff points, and overweight is defined as between 85th to less than the 95th percentile.<sup>91</sup>

and cell growth.<sup>86</sup> Although knowledge about the relationship between weight loss and cancer risk is still limited, recent studies suggest that losing weight may reduce the risk of breast cancer. In addition, surgery to treat extreme obesity has been shown to improve insulin sensitivity and hormone metabolism and reduce mortality from diabetes, heart disease, and cancer.<sup>87,88</sup>

Health care professionals have an important role in helping patients control their body weight. Primary care physicians should assist patients who are overweight or obese in managing and controlling their body weight and in counseling them about safe and effective weight loss and weight maintenance programs.<sup>86,89</sup> The National Heart, Lung and Blood Institute's (NHLBI) guidelines on obesity<sup>90</sup> offer clinicians an easily adaptable blueprint and tools for incorporating information about weight, nutrition, and physical activity into their discussions with patients, assessing a patient's motivation to lose weight, and enabling patients in developing and implementing strategies for self-management and behavior change.<sup>86,89</sup>

### Obesity Trends

- More than two-thirds of Americans are overweight or obese.<sup>92</sup>
- Between 1976-1980 and 1999-2000, the prevalence of obesity among adolescents aged 12 to 19 tripled from 5% to 15.5%. Increases occurred across race, ethnicity, and gender; non-Hispanic African American girls have the highest rates of overweight (Figure 2A, page 20). No changes in the prevalence of obesity were observed between 1999-2000 and 2007-2008 (18.1%), except for an increase among boys aged 6 to 19 in the heaviest weight categories (BMI for age at or above the 97th percentile).<sup>93</sup>
- The percentage of US high school students who were obese in 2009 varied widely across states; Utah had the lowest proportion of obese adolescents (10.5%), and Mississippi the highest (18.3%). (Table 2A, page 22, provides additional overweight measures in certain cities.)
- The percent of obese adults aged 20 to 74 varied little from 1960-1962 to 1976-1980; in contrast, obesity rates more than doubled between 1976-1980 and 1999-2000 from 15.1% to 31%.
- In the past decade, obesity trends in women have remained relatively stable, from 33.4% in 1999-2000 to 35.5% in 2007-2008; among men, prevalence increased from 27.5% to 32.2% during this period.<sup>94</sup>
- Non-Hispanic African American and Hispanic women have significantly higher rates of obesity than non-Hispanic white women, but such differences are not observed among men (Figure 2B, page 21).<sup>92</sup> These racial and ethnic disparities are generally consistent across states as well; in 2006-2008, obesity rates across states range from 23% to 45% among African Americans, 21% to 37% among Hispanics, and from 9% to 30% among whites.<sup>95</sup>
- The increase in the rate of adults classified as extremely obese has significantly contributed to the increase in obesity rates in the past 25 years. Rates of extreme obesity among adults aged 20 to 74 years increased from 1.4% in 1976-1980 to 6.0% in 2007-2008.
- In 2009, the prevalence of obesity exceeded more than 20 percent in all states except Colorado (18.9%); the state with the highest obesity prevalence is Mississippi (35.4%) (Table 2B, page 24).

## Examples of Moderate and Vigorous Physical Activity

|                              | Moderate-intensity Activities   | Vigorous-intensity Activities  |
|------------------------------|---|--|
| <b>Exercise and leisure</b>  | Walking, dancing, leisurely bicycling, ice and roller skating, horseback riding, canoeing, yoga | Jogging or running, fast bicycling, circuit weight training, aerobic dance, martial arts, jumping rope, swimming |
| <b>Sports</b>                | Volleyball, golfing, softball, baseball, badminton, doubles tennis, downhill skiing             | Soccer, field or ice hockey, lacrosse, singles tennis, racquetball, basketball, cross-country skiing             |
| <b>Home activities</b>       | Mowing the lawn, general yard and garden maintenance  | Digging, carrying, and hauling, masonry, carpentry   |
| <b>Occupational activity</b> | Walking and lifting as part of the job (custodial work, farming, auto or machine repair)        | Heavy manual labor (forestry, construction, fire fighting)   |

### Achieving and Maintaining a Healthy Weight

A healthy weight depends on a person's height. Weight recommendations are often determined by a measure known as body mass index (BMI). (See sidebar, opposite page.) Cutoffs established by the World Health Organization define the healthy range of BMI to be 18.5 to 25.0 kg/m<sup>2</sup>, overweight range to be 25.0 to 29.9, and a BMI of 30.0 or higher as obese.

The best way to achieve and maintain a healthy body weight is to balance caloric intake with physical activity.<sup>83,96</sup> For individuals who are overweight, limiting consumption of foods and beverages high in calories, fat, and added sugars, as well as alcohol, can help reduce caloric intake. Eating smaller portion sizes will also help. High-calorie and low-nutrient foods should be replaced with vegetables and fruits, whole grains, beans, and lower-calorie beverages.<sup>97</sup>

Unhealthy dietary patterns, physical inactivity, and excessive weight gain that begin during childhood often continue into adulthood and increase the risk of developing cancer, cardiovascular disease, diabetes, hypertension, and osteoporosis later in life. About half of children who are overweight will remain overweight in adulthood; 70% of those who are overweight by adolescence will remain overweight as adults.<sup>98</sup> Hence, a focus on obesity prevention for children and adolescents is important because the diet and physical activity habits that they form will set the foundation for their choices and behaviors as adults.<sup>99,100</sup>

### 2. Adopt a physically active lifestyle.

- **Adults:** Engage in at least 30 minutes of moderate to vigorous physical activity, above usual activities, on 5 or more days of the week; 45 to 60 minutes of intentional physical activity is preferable.
- **Children and adolescents:** Engage in at least 60 minutes per day of moderate to vigorous physical activity at least 5 days per week.

### Benefits of Physical Activity

Physical activity acts in a variety of ways to reduce the risk of several types of cancer, including cancers of the breast, colon, prostate, and endometrium.<sup>83</sup> A physically active lifestyle also reduces the risk of other chronic diseases, such as heart disease, diabetes, osteoporosis, and hypertension.<sup>85,101</sup>

### Types of Activity and Recommendations

Usual physical activity during a person's daily routine is typically of low intensity and short duration. Intentional physical activities associated with fitness or transportation (e.g., bike riding, brisk walking) generally require more effort, engage large muscle groups, and cause a noticeable increase in heart rate, breathing depth and frequency, and sweating. (For selected examples of moderate and vigorous activities, see sidebar, above.)

Although the optimal intensity, duration, and frequency of physical activity needed to reduce cancer risk are unknown, studies suggest that 45–60 minutes on 5 or more days of the week is sufficient to reduce risk of colon and breast cancer.<sup>83</sup> Other studies have shown that one hour of exercise on 5 or more days each week helps to prevent weight gain and obesity.<sup>85,96</sup> In addition to having a direct impact on reducing the risk of breast and colon cancers, physical activity may also have an indirect effect on reducing the risk of developing obesity-related cancers because of its role in helping to maintain a healthy weight.

For people who are largely inactive or just beginning a physical activity program, a gradual increase to 30 minutes per day of moderate physical activity on at least 5 days per week will provide substantial cardiovascular benefits. After this duration is achieved, increasing intensity to vigorous levels may further improve health benefits for those individuals who are physically able. Most children and young adults can safely engage in moderate physical activity without consulting their physicians. However, men older than 40, women older than 50, and people with chronic

illnesses and/or established cardiovascular risk factors should consult their physicians before beginning a vigorous physical activity program.

Individuals who are already active at least 30 minutes on most days of the week should strive to accumulate 60 minutes of moderate or greater intensity activity on most days of the week.

### Current Physical Activity Level in Adolescents

- In 2009, 37% of US youth were physically active for at least 60 minutes on more than 5 days per week and 33.3% attended physical education classes daily (Table 2A, page 22).
- In 2009, 32.8% of US high school students reported watching three or more hours of television per day (Table 2A, page 22).

### Current Physical Activity Level in Adults

- In 2009, 24.4% of adults reported no leisure-time physical activity. The percentage of adults reporting no leisure-time physical activity ranged from 15.8% in Minnesota to 33.2% in West Virginia (Table 2B, page 24).
- In 2009, 49.5% of adults reported engaging in moderate levels of activity and 23.8% in vigorous levels of physical activity (Table 2B, page 24).

Physical activity plays an important role in the health and well-being of children and adolescents, and has important physical, mental, and social benefits. Therefore, children and adolescents

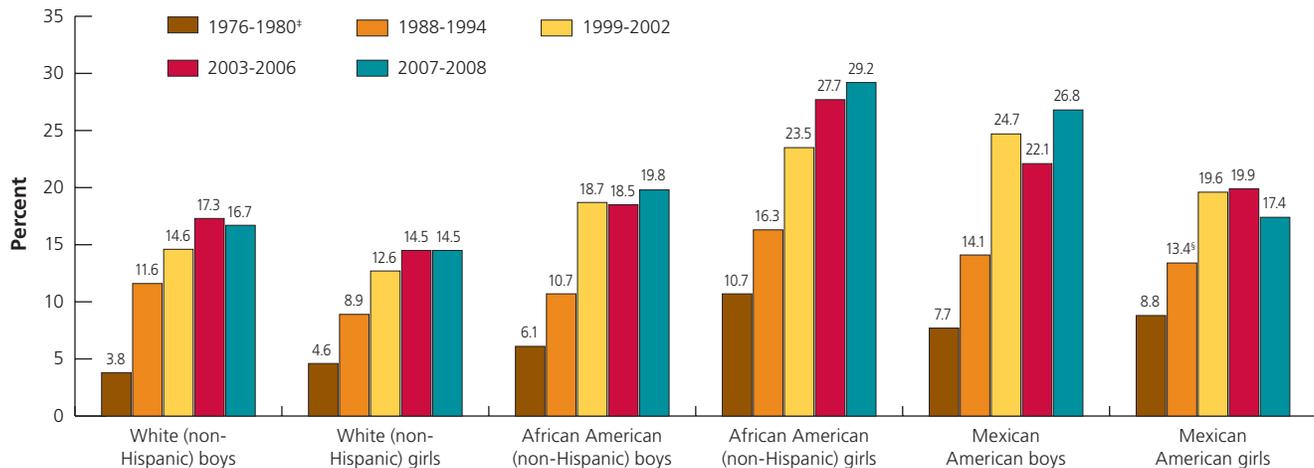
should be encouraged to be physically active at moderate to vigorous intensities for at least 60 minutes per day on 5 or more days per week.<sup>102,103</sup> The availability of routine, high-quality physical education programs is a recognized and critically important way of increasing physical activity among youth. Daily physical education and activities should be provided for children at school, and sedentary activities (e.g., watching television, playing video games) should be minimized at home.

### 3. Consume a healthy diet with an emphasis on plant sources.

#### Choose foods and beverages in amounts that help to achieve and maintain a healthy weight.

- Become familiar with standard serving sizes, and read food labels to become more aware of actual servings consumed.
- Eat smaller portions of high-calorie foods. Be aware that “low fat” or “nonfat” does not mean “low calorie,” and that low-fat cakes, cookies, and similar foods are often high in calories.
- Substitute vegetables, fruits, and other low-calorie foods and beverages for calorie-dense foods and beverages such as French fries, cheeseburgers, pizza, ice cream, doughnuts, and other sweets, as well as regular sodas.
- When you eat away from home, choose food low in calories, fat, and sugar, and avoid large portion sizes.

**Figure 2A. Obesity\* Trends, Adolescents 12-19 Years, by Gender and Race/Ethnicity†, US, 1976-2008**



\*BMI at or above the sex- and age-specific 95th percentile BMI cutoff points from the 2000 sex-specific BMI-for-age CDC Growth Charts. †Persons of Mexican origins may be of any race. Data estimates for white (non-Hispanic) and African American (non-Hispanic) races starting in 1999 data may not be strictly comparable with estimates for earlier years because of changes in Standards for Federal Data on Race and Ethnicity. ‡Data for Mexican Americans are for 1982-84. §Estimate is considered unreliable.

**Source:** 1976-2006: National Health and Nutrition Examination Survey, Hispanic Health and Nutrition Examination Survey (1982-84). Centers for Disease Control and Prevention, National Center for Health Statistics, Health, United States, 2008, With Special Feature on the Health of Young Adults. Hyattsville, Maryland: 2009. 2007-2008: Ogden CL, et al. Prevalence of High Body Mass Index in US Children and Adolescents, 2007-2008. *JAMA*.2010; 303(3):242-249.

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### Eat 5 or more servings of vegetables and fruits each day.

- Include vegetables and fruits at every meal and for snacks.
- Eat a variety of vegetables and fruits each day.
- Limit French fries, chips, and other fried vegetable products.
- Choose 100% juice if you drink vegetable or fruit juices.

### Choose whole grains in preferences to processed (refined) grains and sugars.

- Choose whole-grain rice, bread, pasta, and cereals.
- Limit consumption of refined carbohydrates, including pastries, sweetened cereals, and other high-sugar foods.

### Limit consumption of processed and red meats.

- Choose fish, poultry, or beans as an alternative to beef, pork, and lamb.
- When you eat meat, select lean cuts and eat smaller portions.
- Prepare meat by baking, broiling, or poaching rather than by frying or charbroiling.

The study of nutrition and cancer is complex, and many important questions remain unanswered. It is not completely understood how single or combined foods or nutrients affect a person's risk of specific cancers. However, it has been shown that diets very

### What Counts as a Serving

**Fruits:** 1 medium apple, banana, or orange; ½ cup of chopped, cooked, or canned fruit; ¼ cup of dried fruit; ½ cup of 100% fruit juice

**Vegetables:** 1 cup of raw, leafy vegetables; ½ cup of other cooked or raw vegetables, chopped; ½ cup of 100% vegetable juice

**Grains:** 1 slice of bread; 1 ounce of ready-to-eat cereal; ½ cup of cooked cereal, rice, or pasta

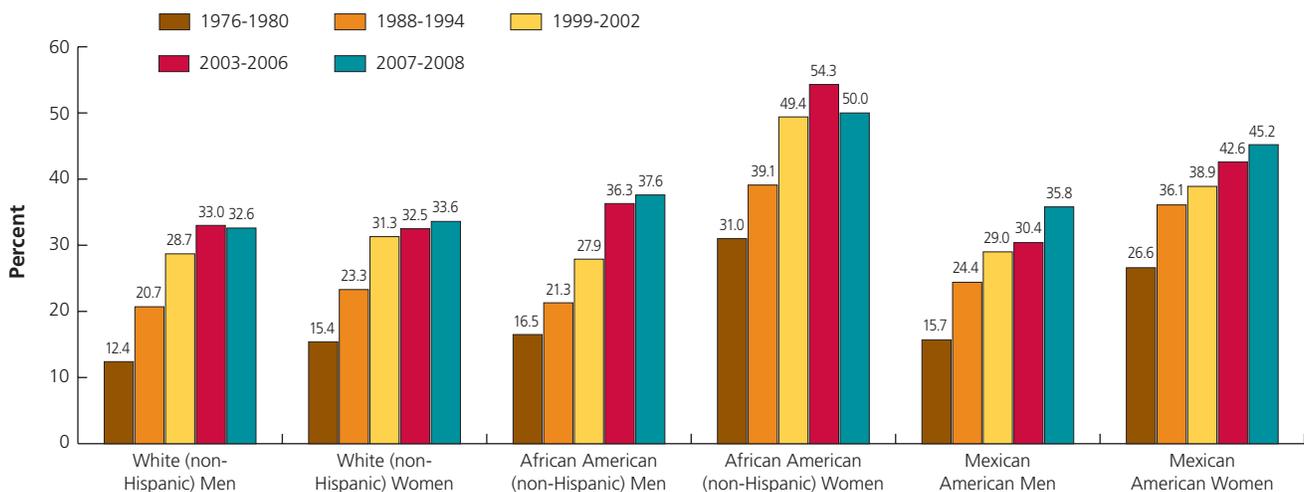
**Beans and nuts:** ½ cup of cooked dry beans; 2 tablespoons of peanut butter; ⅓ cup of nuts

**Dairy food or eggs:** 1 cup of milk or yogurt; 1½ ounces of natural cheese; 2 ounces of processed cheese; 1 egg

**Meats:** 2-3 ounces of cooked lean meat, poultry, or fish

low in vegetables, fruits, and whole grains, and high in processed and red meats are linked to an increased risk of some of the most common types of cancers. Until more is known about how specific dietary components influence cancer risk, the best advice is to consume whole foods within a healthy dietary pattern, with special emphasis on controlling total caloric intake to help achieve and maintain a healthy weight.

**Figure 2B. Obesity\* Trends, Adults 20-74 Years, by Gender and Race/Ethnicity, US, 1976-2008†**



\*Body mass index of 30.0 kg/m<sup>2</sup> or greater. Age adjusted to the 2000 US standard population. †Persons of Mexican origins may be of any race. Data estimates for white (non-Hispanic) and African American (non-Hispanic) races starting in 1999 data may not be strictly comparable with estimates for earlier years because of changes in Standards for Federal Data on Race and Ethnicity. ‡Data for Mexican Americans are for 1982-84.

**Source:** 1976-2006: National Health and Nutrition Examination Survey, Hispanic Health and Nutrition Examination Survey (1982-84). Centers for Disease Control and Prevention, National Center for Health Statistics, Health, United States, 2008, With Special Feature on the Health of Young Adults. Hyattsville, Maryland: 2009. 2007-2008: National Health and Nutrition Examination Survey Public Use Data File, 2007-2008 National Center for Health Statistics, Centers for Disease Control and Prevention, 2009.

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**Table 2A. Overweight, Obesity, and Related Factors, High School Students, by State and City/County, US, 2009**

|                              | %<br>Overweight* | %<br>Obese† | Rank‡ | % Watched<br>three or more<br>hours per day<br>of television§ | % Met currently<br>recommended<br>levels of<br>physical activity¶ | % Attended<br>physical<br>education<br>classes daily | % Played on<br>one or more<br>sports teams# | % Ate fruits<br>and vegetables<br>five or more<br>times a day** |
|------------------------------|------------------|-------------|-------|---|---|--|---|---|
| <b>United States</b>         | 15.8             | 12.0        |       | 32.8  | 37.0  | 33.3   | 58.3  | 22.3  |
| <b>State</b>                 |                  |             |       |   |   |  |   |   |
| Alabama                      | 17.5             | 13.5        | 29    | 37.8  | 37.3  | 31.8   | 50.8  | 16.3  |
| Alaska                       | 14.4             | 11.8        | 16    | 24.8  | 42.4  | 17.7   | 61.9  | 17.2  |
| Arizona                      | 14.6             | 13.1        | 27    | 33.3  | 46.8  | 32.6   | 51.9  | N/A   |
| Arkansas                     | 15.7             | 14.4        | 35    | 36.4  | 42.0  | 22.7   | 52.2  | 14.9  |
| Colorado                     | 11.1             | 7.1         | 2     | 25.1  | 47.0  | 20.7   | 63.9  | 24.4  |
| Connecticut                  | 14.5             | 10.4        | 9     | 30.2  | 45.2  | N/A  | N/A   | 21.0  |
| Delaware                     | 15.8             | 13.7        | 32    | 37.7  | 40.4  | 25.4   | 53.2  | N/A   |
| Florida                      | 14.7             | 10.3        | 7     | 38.2  | 40.8  | 26.7   | 50.0  | 21.6  |
| Georgia                      | 14.8             | 12.4        | 22    | 39.2  | 42.8  | 29.8   | 54.3  | 17.1  |
| Hawaii                       | 14.0             | 14.5        | 37    | 30.1  | 34.4  | 11.4   | N/A   | 17.2  |
| Idaho                        | 12.0             | 8.8         | 3     | 21.9  | 53.6  | 23.7   | 61.2  | 18.5  |
| Illinois                     | 15.5             | 11.9        | 18    | 35.7  | 44.7  | 67.5   | 58.7  | 18.3  |
| Indiana                      | 15.9             | 12.8        | 26    | 29.0  | 40.6  | 23.0   | 54.5  | 16.1  |
| Kansas                       | 13.1             | 12.4        | 23    | 28.3  | 48.9  | 20.1   | 60.1  | 20.5  |
| Kentucky                     | 15.6             | 17.6        | 41    | 28.8  | 38.9  | 23.1   | 48.2  | 14.2  |
| Louisiana                    | 18.0             | 14.7        | 38    | 40.3  | 39.5  | 36.4   | 50.6  | 13.9  |
| Maine                        | 15.1             | 12.5        | 25    | 25.4  | 36.8  | 5.4  | N/A   | N/A   |
| Maryland                     | 15.6             | 12.2        | 20    | 39.1  | 38.8  | 20.0   | 57.5  | 22.5  |
| Massachusetts                | 14.3             | 10.9        | 12    | 30.4  | 33.5  | 17.9   | 58.9  | N/A   |
| Michigan                     | 14.2             | 11.9        | 19    | 29.6  | 46.8  | 31.0   | N/A   | 19.6  |
| Mississippi                  | 16.5             | 18.3        | 42    | 44.9  | 39.7  | 26.1   | 53.8  | 21.2  |
| Missouri                     | 14.4             | 14.4        | 36    | 32.4  | 48.3  | 33.1   | 59.6  | 20.4  |
| Montana                      | 11.9             | 10.4        | 10    | 23.7  | 46.0  | 32.2   | 57.7  | 18.4  |
| Nevada                       | 13.4             | 11.0        | 13    | 35.1  | 44.1  | N/A  | N/A   | 17.0  |
| New Hampshire                | 13.3             | 12.4        | 24    | 23.0  | 45.3  | 24.0   | N/A   | N/A   |
| New Jersey                   | 14.2             | 10.3        | 8     | 32.6  | 41.5  | N/A  | 62.2  | 20.1  |
| New Mexico                   | 14.6             | 13.5        | 30    | 32.6  | 45.8  | 30.2   | N/A   | 20.9  |
| New York                     | 15.6             | 11.0        | 14    | 32.7  | 42.3  | 15.4   | 59.6  | N/A   |
| North Carolina               | 14.6             | 13.4        | 28    | 36.2  | 46.0  | N/A  | N/A   | 16.9  |
| North Dakota                 | 13.5             | 11.0        | 15    | 25.6  | 43.7  | N/A  | N/A   | 13.7  |
| Oklahoma                     | 16.4             | 14.1        | 33    | 29.0  | 47.4  | 31.4   | 52.4  | 14.8  |
| Pennsylvania                 | 15.9             | 11.8        | 17    | 30.8  | 45.9  | 20.9   | 57.4  | 20.4  |
| Rhode Island                 | 16.7             | 10.4        | 11    | 29.1  | 44.0  | 22.2   | N/A   | 22.6  |
| South Carolina               | 15.0             | 16.7        | 40    | 39.7  | 33.3  | 16.8   | 51.3  | 14.7  |
| South Dakota                 | 12.6             | 9.6         | 5     | 22.6  | 46.7  | 19.0   | 64.4  | 14.7  |
| Tennessee                    | 16.1             | 15.8        | 39    | 37.7  | 39.7  | 22.9   | 50.1  | 18.1  |
| Texas                        | 15.6             | 13.6        | 31    | 36.3  | 46.6  | 37.4   | 58.8  | 21.3  |
| Utah                         | 10.5             | 6.4         | 1     | 16.3  | 47.3  | 21.8   | 63.6  | 18.4  |
| Vermont                      | 13.6             | 12.2        | 21    | N/A   | 44.9  | 19.4   | N/A   | 22.6  |
| West Virginia                | 14.4             | 14.2        | 34    | 31.5  | 41.8  | 24.0   | 52.2  | 18.2  |
| Wisconsin                    | 14.0             | 9.3         | 4     | 23.1  | 48.5  | 43.2   | N/A   | 19.1  |
| Wyoming                      | 12.6             | 9.8         | 6     | 22.0  | 48.9  | 22.7   | 60.3  | 19.1  |
| <b>City/County</b>           |                  |             |       |   |   |  |   |   |
| Boston, MA                   | 18.2             | 15.0        | 13    | 44.6  | 26.6  | 9.3  | 45.3  | 18.3  |
| Broward County, FL           | 15.6             | 9.7         | 2     | 44.8  | 36.7  | 24.2   | 46.2  | 22.8  |
| Charlotte-Mecklenburg Co, NC | 16.5             | 11.5        | 7     | 42.4  | 43.4  | 26.4   | N/A   | N/A   |
| Chicago, IL                  | 21.1             | 15.1        | 14    | 44.9  | 32.3  | 39.6   | 52.2  | 22.6  |
| Clark County, NV             | 12.9             | 12.3        | 10    | 38.6  | 42.4  | N/A  | N/A   | 17.5  |
| Dallas, TX                   | 19.2             | 16.9        | 17    | 42.8  | 30.4  | 16.4   | 51.4  | 18.0  |
| Detroit, MI                  | 19.6             | 20.8        | 20    | 48.0  | 25.9  | 26.3   | N/A   | 23.4  |
| Duval County, FL             | 16.6             | 12.9        | 11    | 41.0  | 30.1  | 8.4  | 49.2  | 18.2  |
| Los Angeles, CA              | 19.1             | 14.1        | 12    | 39.5  | 39.5  | 42.1   | 52.7  | 19.5  |
| Memphis, TN                  | 18.7             | 16.8        | 16    | 59.6  | 32.1  | 30.0   | 51.8  | 23.9  |
| Miami-Dade County, FL        | 16.1             | 10.3        | 5     | 43.7  | 36.0  | 12.4   | 47.0  | 24.9  |
| Milwaukee, WI                | 17.1             | 16.6        | 15    | 42.6  | 29.4  | 26.8   | N/A   | N/A   |
| New York City, NY            | 16.6             | 10.7        | 6     | 43.3  | 35.0  | 39.5   | 43.0  | N/A   |
| Orange County, FL            | 15.7             | 11.6        | 9     | 43.5  | 34.5  | 26.4   | 47.5  | 23.5  |
| Palm Beach County, FL        | 13.3             | 9.8         | 3     | 39.9  | 37.0  | 21.3   | 50.4  | 24.1  |
| Philadelphia, PA             | 19.4             | 17.4        | 18    | 52.9  | 32.0  | 24.8   | 43.9  | 17.7  |
| San Bernardino, CA           | 17.5             | 17.4        | 19    | 41.1  | 42.5  | 46.4   | 51.4  | 26.1  |
| San Diego, CA                | 14.0             | 11.5        | 8     | 30.7  | 47.0  | 37.8   | 56.8  | 23.6  |
| San Francisco, CA            | 12.8             | 8.4         | 1     | 29.5  | 34.4  | 29.1   | 42.8  | 21.6  |
| Seattle, WA                  | 13.0             | 10.2        | 4     | 27.7  | 40.1  | 20.2   | 55.0  | 22.4  |

\*Body mass index at or above the 85th percentile but below the 95th percentile of growth chart for age and sex. CPED reports prior to 2010 used the term "at risk for overweight" to describe youth in this BMI category. †Body mass index at or above the 95th percentile of growth chart for age and sex. Previous CPED reports used the term "overweight" to describe youth in this BMI category. ‡Rank is based on % Obese. §During an average school day. ¶Were physically active doing any kind of physical activity that increased their heart rate and made them breathe hard some of the time for a total of at least 60 minutes/day on >5 of the 7 days preceding the survey. #During the 12 months preceding the survey. \*\*Had consumed 100% fruit juice, fruit, green salad, potatoes (excluding French fries, fried potatoes, or potato chips), carrots, or other vegetables >5 times/day during the seven days preceding the survey. 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, 2009, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention. *MMWR Morb Mortal Wkly Rep.* Surveillance Summaries 2010;59(SS-5).

American Cancer Society, Surveillance Research, 2011

## **Control portion size to achieve and maintain a healthy weight.**

Current trends indicate that the largest percentage of calories in the American diet comes from foods high in fat, sugar, and refined carbohydrates and soft drink beverages with sugar. Consuming a varied diet that emphasizes plant foods may help to displace these calorie-dense foods. Limiting portion sizes (see sidebar, page 21), especially of calorie-dense foods, will also reduce total caloric intake.

It should be noted that simply replacing foods high in fat with foods high in calories from sugar and other refined carbohydrates does not protect against unhealthy weight gain and obesity. Consuming processed foods high in added sugars, such as soft drinks and fruit drinks, presweetened cereals, pastries, candies, and syrups, adds little nutritional value to the diet and may contribute to altered amounts and distribution of body fat, insulin resistance, and increased concentrations of growth factors that promote the growth of cancers.

## **Vegetables and Fruits**

Vegetables (including legumes) and fruits contain numerous vitamins, minerals, fiber, carotenoids, and other bioactive substances that may help prevent cancer. Greater consumption of non-starchy vegetables and fruits is associated with decreased risk of lung, upper aerodigestive, esophageal, stomach, and colorectal cancer.<sup>104</sup> Limited data are currently available for other types of cancers, although research is ongoing. The potential benefits of vegetable and fruit consumption may also stem from their replacement of other, more calorie-dense foods and associated maintenance of a healthy weight.<sup>97</sup>

For these reasons, consumption of low-calorie, whole vegetables and fruits has been encouraged by a number of health organizations.<sup>96,101</sup> However, among American adults and children, the consumption of these foods remains lower than is recommended,<sup>97</sup> perhaps due to reasons such as the lack of availability of affordable produce, preparation time and taste preferences, and the abundance of relatively inexpensive and low-nutrient options (e.g. processed snacks and sugared sodas) that compete with healthier choices.<sup>105</sup> Recommendations for cancer risk reduction are to consume at least 5 servings of a variety of vegetables and fruits each day; however, for overall health, the American Cancer Society supports the recommendation to consume higher levels, depending on calorie needs, as stated in the US Department of Health and Human Services' *Dietary Guidelines for Americans*.<sup>96</sup>

## **Current Prevalence of Consuming Vegetables and Fruits in Adults and Adolescents**

- About one in five (22.3 %) US high school students ate vegetables and fruits 5 or more times per day in 2009 (Table 2A).
- Only 23.5% of adults reported eating 5 or more servings of vegetables or fruit daily in 2007. Across states, prevalence of

consuming 5 or more servings of vegetables or fruit ranged from 14.6% in Oklahoma to 31.5% in the District of Columbia (Table 2B, page 24).

## **Whole Grains**

Grains such as wheat, rice, oats, and barley, and the foods made from them, are an important part of a healthful diet. Whole-grain foods (made from the entire grain seed) are relatively low in caloric density and higher in fiber, certain vitamins, and minerals than processed (refined) flour products.<sup>96</sup> Although the association between whole-grain foods and different types of cancer has been inconsistent, consumption of high-fiber foods is associated with a lower risk of several chronic diseases (e.g., diabetes, cardiovascular disease) and is therefore recommended for the benefit of overall health.<sup>96</sup>

## **Processed and Red Meats**

Numerous studies have examined the relationship between cancer and the consumption of red meats (beef, pork, or lamb) and processed meats (cold cuts, bacon, hot dogs, etc.), and current evidence supports an increased risk of colorectal cancer and possibly prostate cancer.<sup>84</sup> Although meats are good sources of high-quality protein and can supply many important vitamins and minerals, they remain major contributors of total fat, saturated fat, and cholesterol in the American diet. Additionally, heavy meat consumption may lead to the exposure to certain substances that could increase the risk of cancer. In particular, meat that has been fried and/or charcoal-grilled at a very high temperature can produce carcinogenic substances (heterocyclic amines). Substances such as nitrates or nitrites used in processed meats can also contribute to the formation of nitrosamines, which are involved in carcinogenesis.

Recommendations are to limit consumption of processed and red meats by choosing lean meats, smaller portions (e.g., served as a side dish rather than the focus of a meal) and alternatively choosing fish or poultry. Legumes, which are rich in nutrients that may protect against cancer, can be a healthier source of protein than red meats.

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

People who drink alcohol should limit their intake to no more than two drinks per day for men and one drink a day for women.<sup>96</sup> The recommended limit is lower for women because of their smaller body size and slower metabolism of alcohol. A drink of alcohol is defined as 12 ounces of beer, five ounces of wine, or 1.5 ounces of 80-proof distilled spirits.

Alcohol consumption is an established cause of cancers of the mouth, pharynx, larynx, esophagus, and liver.<sup>84,106</sup> For each of these cancers, risk increases substantially with the intake of more than two drinks per day.<sup>84,106</sup> Alcohol consumption combined with tobacco use increases the risk of cancers of the mouth,

**Table 2B. Overweight, Obesity, and Related Factors, Adults 18 and Older, by State, US, 2009**

|                      | % Clinical overweight (25.0-29.9 kg/m <sup>2</sup> ) | % Clinical obese (30.0 kg/m <sup>2</sup> or greater) | % Overweight or obese (25.0 kg/m <sup>2</sup> or greater) | Rank* | % No leisure-time physical activity | % Vigorous physical activity† | % Moderate physical activity‡ | % Eating five or more fruit or vegetable servings a day |
|----------------------|--|--|---|-------|-------------------------------------|-------------------------------|-------------------------------|---|
| Alabama              | 36.5   | 31.7   | 68.2  | 49    | 31.1                                | 21.1                          | 41.1                          | 20.3  |
| Alaska               | 37.7   | 25.5   | 63.3  | 23    | 22.4                                | 40.1                          | 60.5                          | 23.4  |
| Arizona              | 38.4   | 25.9   | 64.3  | 28    | 18.9                                | 30.2                          | 50.7                          | 23.9  |
| Arkansas             | 35.1   | 31.5   | 66.6  | 40    | 29.8                                | 25.3                          | 47.3                          | 20.4  |
| California           | 35.8   | 25.5   | 61.3  | 11    | 22.1                                | 32.9                          | 51.3                          | 27.7  |
| Colorado             | 36.8   | 18.9   | 55.7  | 2     | 17.7                                | 34.6                          | 57.1                          | 24.7  |
| Connecticut          | 38.0   | 21.2   | 59.1  | 7     | 21.6                                | 32.0                          | 53.9                          | 28.2  |
| Delaware             | 36.1   | 27.6   | 63.7  | 25    | 21.8                                | 29.4                          | 51.0                          | 25.1  |
| District of Columbia | 31.7   | 20.1   | 51.8  | 1     | 19.7                                | 34.2                          | 54.5                          | 31.4  |
| Florida              | 36.6   | 26.0   | 62.6  | 19    | 23.6                                | 26.3                          | 47.8                          | 24.6  |
| Georgia              | 37.5   | 27.8   | 65.3  | 33    | 24.2                                | 27.5                          | 45.7                          | 24.5  |
| Hawaii               | 34.9   | 23.0   | 57.9  | 4     | 19.6                                | 34.5                          | 53.2                          | 23.5  |
| Idaho                | 36.2   | 25.1   | 61.3  | 12    | 21.1                                | 36.1                          | 57.6                          | 24.6  |
| Illinois             | 37.0   | 27.4   | 64.4  | 29    | 23.6                                | 31.8                          | 51.8                          | 22.5  |
| Indiana              | 35.2   | 30.0   | 65.2  | 32    | 27.2                                | 28.3                          | 48.1                          | 20.6  |
| Iowa                 | 38.8   | 28.5   | 67.3  | 45    | 24.2                                | 26.9                          | 49.7                          | 18.5  |
| Kansas               | 35.8   | 28.8   | 64.6  | 30    | 23.2                                | 27.5                          | 48.5                          | 18.6  |
| Kentucky             | 34.7   | 32.4   | 67.1  | 43    | 29.7                                | 23.7                          | 45.7                          | 21.1  |
| Louisiana            | 33.7   | 33.9   | 67.6  | 48    | 28.6                                | 22.1                          | 43.6                          | 16.9  |
| Maine                | 37.8   | 26.4   | 64.2  | 27    | 21.2                                | 32.8                          | 56.2                          | 28.0  |
| Maryland             | 36.1   | 26.8   | 62.9  | 21    | 23.8                                | 30.0                          | 48.7                          | 27.5  |
| Massachusetts        | 35.6   | 21.9   | 57.5  | 3     | 21.0                                | 30.9                          | 53.0                          | 26.2  |
| Michigan             | 35.3   | 30.3   | 65.6  | 37    | 23.5                                | 31.3                          | 52.0                          | 22.6  |
| Minnesota            | 37.9   | 25.4   | 63.3  | 24    | 15.8                                | 29.4                          | 52.7                          | 21.9  |
| Mississippi          | 34.9   | 35.4   | 70.3  | 51    | 32.4                                | 19.7                          | 37.5                          | 16.8  |
| Missouri             | 35.0   | 30.6   | 65.6  | 35    | 26.6                                | 27.8                          | 50.0                          | 19.9  |
| Montana              | 38.4   | 23.8   | 62.1  | 16    | 22.1                                | 36.4                          | 58.7                          | 25.7  |
| Nebraska             | 36.7   | 28.1   | 64.8  | 31    | 24.2                                | 29.7                          | 51.1                          | 20.9  |
| Nevada               | 36.5   | 26.5   | 63.1  | 22    | 24.4                                | 30.0                          | 51.5                          | 23.7  |
| New Hampshire        | 36.4   | 26.4   | 62.8  | 20    | 21.2                                | 32.9                          | 53.4                          | 28.0  |
| New Jersey           | 38.0   | 24.0   | 62.0  | 15    | 26.2                                | 26.8                          | 47.6                          | 26.3  |
| New Mexico           | 36.2   | 25.6   | 61.8  | 14    | 22.4                                | 32.3                          | 53.3                          | 23.2  |
| New York             | 35.6   | 24.7   | 60.3  | 8     | 26.4                                | 28.4                          | 50.8                          | 26.7  |
| North Carolina       | 35.3   | 30.2   | 65.5  | 34    | 26.4                                | 25.8                          | 46.4                          | 20.6  |
| North Dakota         | 37.8   | 28.4   | 66.2  | 39    | 26.7                                | 29.2                          | 52.3                          | 22.5  |
| Ohio                 | 36.9   | 29.8   | 66.7  | 41    | 26.3                                | 27.7                          | 48.5                          | 21.0  |
| Oklahoma             | 35.4   | 32.0   | 67.4  | 46    | 31.4                                | 25.9                          | 47.1                          | 14.6  |
| Oregon               | 37.1   | 23.6   | 60.8  | 10    | 17.7                                | 33.7                          | 56.5                          | 26.3  |
| Pennsylvania         | 35.9   | 28.1   | 64.0  | 26    | 25.7                                | 27.9                          | 50.5                          | 24.1  |
| Rhode Island         | 36.7   | 25.0   | 61.7  | 13    | 24.9                                | 29.0                          | 48.4                          | 26.2  |
| South Carolina       | 35.7   | 30.1   | 65.8  | 38    | 26.2                                | 24.4                          | 45.5                          | 17.4  |
| South Dakota         | 36.9   | 30.3   | 67.1  | 44    | 24.5                                | 24.0                          | 45.0                          | 15.7  |
| Tennessee            | 36.2   | 32.9   | 69.1  | 50    | 31.0                                | 17.1                          | 35.9                          | 23.3  |
| Texas                | 37.3   | 29.6   | 66.8  | 42    | 27.3                                | 28.6                          | 48.2                          | 23.8  |
| Utah                 | 34.0   | 24.0   | 58.0  | 5     | 17.7                                | 38.1                          | 57.6                          | 23.4  |
| Vermont              | 34.8   | 23.4   | 58.2  | 6     | 20.1                                | 34.5                          | 58.1                          | 29.3  |
| Virginia             | 35.0   | 25.6   | 60.6  | 9     | 22.0                                | 31.8                          | 51.4                          | 27.3  |
| Washington           | 35.5   | 27.0   | 62.5  | 18    | 19.6                                | 30.5                          | 53.7                          | 25.1  |
| West Virginia        | 35.9   | 31.7   | 67.6  | 47    | 33.2                                | 15.7                          | 35.2                          | 16.2  |
| Wisconsin            | 36.3   | 29.3   | 65.6  | 36    | 22.0                                | 31.1                          | 52.8                          | 22.6  |
| Wyoming              | 36.8   | 25.4   | 62.2  | 17    | 22.4                                | 35.3                          | 57.3                          | 23.3  |
| United States§       | 36.2   | 27.4   | 63.7  |       | 24.4                                | 28.9                          | 49.5                          | 23.8  |
| Range                | 31.7-38.8  | 18.9-35.4  | 51.8-70.3   |       | 15.8-33.2                           | 15.7-40.1                     | 35.2-60.5                     | 14.6-31.4   |

\*Rank based on % overweight (25kg/m<sup>2</sup> or greater). †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 yard work). ‡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 for definition.

**Source:** Behavioral Risk Factor Surveillance System Public Use Data Tape 2009, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2010.

American Cancer Society, Surveillance Research, 2011

larynx, and esophagus far more than the independent effect of either drinking or smoking.<sup>84</sup> Evidence also implicates alcohol consumption as a cause of cancers of the breast and colorectum.<sup>84</sup> Reducing alcohol consumption may be an important way for many women to reduce their risk of breast cancer; in particular, women with a low intake of folate may be susceptible to the increase in breast cancer risk from alcohol. Overall, the evidence seems to indicate that total alcohol consumption is the important factor, not the type of alcoholic beverage consumed.

Complicating the recommendation for alcohol and cancer risk reduction is the fact that low to moderate intake of alcoholic beverages has been associated with decreased risk of coronary heart disease.<sup>107</sup> There is no compelling reason for adults who currently do not consume alcoholic beverages to start consuming alcohol to reduce their risk for heart disease because cardiovascular risk can be reduced by other means, such as not smoking, consuming a diet low in saturated and trans fats, maintaining a healthy weight, staying physically active, and controlling blood pressure and lipids. Some groups of people should not drink alcoholic beverages at all, including children and adolescents and individuals of any age who cannot restrict their drinking to moderate levels or who have a family history of alcoholism.

Following the cancer prevention recommendations for a healthy lifestyle has been shown to reduce the risk of death from cancer, as well as other chronic diseases.<sup>108</sup> A recent study showed that adults who follow all of these lifestyle recommendations reduce their risk of premature death by 40%, compared to people whose lifestyles are less healthy. Each of the recommendations for healthy body weight, physical activity, a healthy diet pattern, and limiting alcohol are important.<sup>108</sup> Healthy behaviors in the US have not improved over time,<sup>109</sup> underscoring the need for addressing healthy lifestyle not only at the individual level, but at the community level as well.

## Community Action

The dramatic rise in obesity levels in the US in the past several decades has serious implications for public health and the economy.<sup>101</sup>

In 2008, the medical costs for overweight and obesity were estimated to be \$147 billion (or 9.1% of US health care expenditures), with half of these costs paid for publicly through the Medicare and Medicaid programs.<sup>110</sup> Experiences in tobacco control and other public health initiatives have shown that public policies and environmental strategies may be powerful tools to affect structural change to alter population-level behavior.

Policies and programs that support healthy behaviors throughout the life cycle are needed to address the prevailing socio-environmental factors contributing to increased obesity by reducing individuals' opportunities to eat healthy and be physically active.<sup>85,101,102</sup> Such socio-environmental factors include lack of

access to full-service grocery stores, relatively high costs of healthy foods compared to processed foods, and lack of access to safe places to play and exercise.<sup>101</sup> Historical changes that likely contributed to the obesity epidemic include reduced leisure time for physical activity, shifts from using walking as a mode of transportation to increased reliance on automobiles, shifts to more mechanized or sedentary work, more meals eaten away from home, increased marketing and availability of cheap but energy-dense processed foods, and increased consumption of larger portion sizes.<sup>85,97,101,102,105</sup>

Many experts and governmental and nongovernmental organizations recognize that obesity is a complex problem that requires a broad range of effective approaches.<sup>85,101,102</sup> The American Cancer Society believes that while educating the public about healthy behaviors is important to help them stay well, creating environments that make it easier for people to make healthy choices is critical if widespread changes are to be seen at a population level.<sup>111</sup> Thus, the Society's nutrition and physical activity guidelines call attention to community action strategies that can increase access to healthy food and provide safe, enjoyable, and accessible environments for physical activity in all community settings (e.g., schools, workplaces). (See sidebar, page 17.) Schools and child care facilities, workplaces, and health care facilities are important settings for the implementation of policies and programmatic initiatives. The appeal of setting-based approaches includes the ability to implement effective strategies to target populations (e.g., students, employees, or patients) and also to influence social norms within the setting, with possible transfer to behavior outside of the setting through linkage with community-based prevention programs.<sup>101</sup>

The next section features some recent government strategies as well as efforts by the Society and its nonprofit, nonpartisan advocacy affiliate, the American Cancer Society Action Network (ACS CAN), in order to foster and support public policy and wellness initiatives that help promote healthy environments for all Americans.

## Community Action Strategies

There are multiple ways that public and private organizations at the local, state, and national levels can develop policies and allocate or expand resources to facilitate necessary changes.<sup>99,100</sup> Schools can ensure that students participate in physical activity programs and promote the availability of healthful food and beverages. Employers can implement worksite health promotion programs.<sup>99,100</sup> Health care professionals can advise and assist their patients on effective weight loss programs.<sup>86,89</sup> At the state and local level, community leaders, in particular, can promote policy changes that may include regulation of the school food environment, zoning changes, tax incentives that bring food stores into poor neighborhoods, and the creation of safe spaces that promote physical activity.<sup>100</sup> A growing number and variety of policies are being implemented at the local and state levels of

government that are intended to promote healthy eating and active living; many of these policies have targeted the food environment and activity requirements in schools.<sup>100,111</sup>

The Centers for Disease Control and Prevention (CDC), the Institute of Medicine, the World Health Organization, and others have outlined a variety of evidenced-based approaches in schools, worksites, and communities to halt and ultimately reverse obesity trends.<sup>84,100,102,107,112</sup> In February 2010, President Obama issued an executive order creating the White House Task Force on Childhood Obesity, which included leadership from the Departments of Agriculture, Health and Human Services, and Education, and the Office of Management and Budget, among others. The task force released their report in May 2010, which included numerous recommendations for solving the problem of childhood obesity within a generation.<sup>99</sup> Some specific approaches that have been proposed are outlined in the sidebar below.<sup>98-100,111,112</sup>

The Society and ACS CAN support evidence-based cancer prevention strategies that promote and reduce barriers to healthy living through research, education, outreach, health promotion programs, and advocacy. The Society and ACS CAN are actively working to advance some of these evidence-based strategies in states and localities nationwide.

The District of Columbia is one example of a jurisdiction that has shown significant leadership in supporting policy and strategies to improve nutrition, increase physical activity, and reduce obesity among its residents. (See sidebar, page 27).

## Federal Government Strategies

Through recent initiatives, the federal government has shown unprecedented support for strategies to improve nutrition and increase physical activity. In February 2010, in conjunction with President Obama's executive order creating the White House Task Force on Childhood Obesity, First Lady Michelle Obama launched the Let's Move initiative, focused on engaging parents, caregivers, youth, educators, industry, policy makers at all levels of government, and others to solve the problem of childhood obesity within a generation. The Let's Move campaign has four pillars:

- Empowering parents and caregivers to make healthier choices
- Providing healthy food in schools
- Improving access to healthy, affordable foods
- Increasing physical activity

The pillars of the Let's Move campaign also provided the framework for the White House Obesity Task Force report.<sup>99</sup>

The American Recovery and Reinvestment Act of 2009 provided significant funding for public health, which included \$650 million for community-based prevention and wellness initiatives. Led by the CDC, the Communities Putting Prevention to Work initiative awarded two-year grants to communities and states to implement community-level policy and environmental change initiatives that address nutrition, physical activity, and tobacco use in youth and adults. Grants were also awarded to national nonprofit organizations to provide technical assistance and support.

### **Strategies to Promote the Availability of Affordable Healthy Food and Beverages**

- Limit availability, advertising, and marketing of foods and beverages of low nutritional value, particularly in schools.
- Strengthen nutritional standards in schools for foods and beverages served as part of the school meals program and for competitive foods and beverages served outside of the program.
- Encourage restaurants to provide nutrition information on menus, especially calories.

### **Strategies to Encourage Physical Activity or Limit Sedentary Activity among Children and Youth**

- Invest in community design that supports the development of sidewalks, bike lanes, and access to parks and green space.
- Increase and enforce physical education requirements in grades K-12.

### **Strategies to Create Safe Communities That Support Healthy Eating and Physical Activity**

- Implement large-scale marketing campaigns targeting consumers and decision makers to increase awareness of the lifestyle/cancer connection and to motivate people to take action to make their worksites, schools, and communities more "health friendly."
- Develop and promote "communities of excellence" that result in policy and environmental changes within worksites, schools, and communities that increase access to healthy foods and opportunities for physical activity.
- Increase federal funding so that states can implement comprehensive nutrition and physical activity plans.

### **Strategies to Encourage Communities to Organize for Change**

- Encourage collaboration among government, nonprofit, and private sectors to develop research and intervention programs.
- Increase resources from governmental and nongovernmental sources to facilitate the implementation of a strategic and action-oriented plan to address the obesity problem.

The CDC is also supporting policy and environmental change strategies to promote healthy eating and physical activity in states and communities through other programs. In 2010, 25 states were funded through the CDC's State-based Nutrition, Physical Activity, and Obesity Program to coordinate statewide efforts with multiple partners to address obesity. The CDC also funds school- and community-based programs focused on improving nutrition and increasing physical activity in youth and adults, respectively.

The Affordable Care Act (ACA), which was passed and signed into law in March 2010, provides funding and support for several obesity prevention initiatives. Through the Prevention and Public Health Fund, a permanent source of annual funding for

prevention and public health initiatives created through the act, an additional \$74 million was provided for community-based environmental change initiatives through the Communities Putting Prevention to Work program.

The ACA also included a menu labeling requirement, mandating that all chain restaurants with 20 or more venues nationally prominently post calorie information on menus, menu boards, and food tags and make other nutrition information available to consumers upon request.<sup>113,114</sup> Vending machine owners or operators with 20 or more vending machines are also required to post calorie information for each item available for purchase. These requirements will likely go into effect in 2011, after final regulations are issued.

## District of Columbia Creates Healthier Schools and Communities

In May 2010, the District of Columbia Council passed the Healthy Schools Act, which is designed to improve the health, wellness, and nutrition for the 75,000 public and public charter school students in the District. The requirements of the law went into effect at the beginning of the 2010-2011 school year. The Society's South Atlantic Division, of which the District of Columbia is a part, worked to help secure the passage of the Healthy Schools Act and is now engaged with the school system to ensure its implementation.

Specifically, the Healthy Schools Act:

- Makes school meals healthier by adopting the USDA's Healthier US School Challenge Gold Level nutrition standards
- Increases the amount of fruits, vegetables, and whole grains served in schools
- Prohibits the marketing in schools of foods and beverages that do not meet nutritional standards
- Establishes a farm-to-school program to bring local produce into District of Columbia schools
- Increases the amount of physical activity and health education in schools
- Promotes recycling, energy efficiency, school gardens, and other green initiatives
- Improves school health and wellness programs
- Establishes a "Healthy Schools and Youth Commission" to regularly examine the health of our schools

Since the passage of the Healthy Schools Act, the Food, Environmental, and Economic Development in the District of Columbia Act of 2010 (FEED DC Act), a bill focused on increasing community access to healthy foods has been introduced in the Council. The Society's South Atlantic Division has announced its support. The FEED DC Act would:

- Establish a grocery store development program to increase and improve supermarkets in underserved communities and provide coordination and technical assistance.
- Establish a healthy corner store program to increase fresh produce and other healthy foods in convenience stores and other small food retailers.
- Increase the number of supermarkets and corner stores that accept SNAP (food stamps) and WIC benefits.
- Convene a working group to develop a plan for establishing a commercial distribution system for fresh produce and other healthy foods to corner stores.

Also concerned about the high rates of overweight and obesity, the District of Columbia Department of Health released its first-ever obesity report and action plan in May 2010, which examined the factors contributing to the high rates of obesity in the District and laid out a five-year strategic plan for the entire District of Columbia government and the community to reduce obesity rates. The District has since created new bike lanes and launched the largest bike-sharing program in the US, supported the development of numerous farmers' markets and the opening of the first-ever healthy foods store in an underserved neighborhood, created numerous parks and playgrounds across the city, and launched the Live Well DC initiative to educate the public about the importance of making healthy lifestyle choices.

The District of Columbia sets an example for the nation in taking a proactive approach to healthy living and reducing obesity.



## The Society's Initiatives in Addressing Obesity/Overweight through Promotion of Nutrition and Physical Activity

The Society works in many ways to improve weight control and increase levels of physical activity and consumption of healthy diets to reduce the risk of cancer and other chronic diseases, as well as to help facilitate changes in schools, worksites, and communities that make it easier for people to make healthier choices.<sup>85</sup>

The Society and ACS CAN are engaged in many initiatives and collaborate with many organizations, such as the American Heart Association, the American Diabetes Association, and the CDC, to identify and disseminate effective public health strategies to address the epidemic of overweight and obesity.

- Through its Corporate & Systems Initiative, the Society works with companies throughout the country to improve their wellness offerings to employees, including initiatives that promote physical activity and healthy eating, as well as those that enable employers to create a healthier workplace environment.
- To promote healthy lifestyles among youth, the Society works with partners to increase the capacity of school systems to address K-12 health education, which includes increasing student knowledge and skills related to good nutrition, lifelong physical activity, and tobacco avoidance. The Society publishes the National Health Education Standards (NHES) and has been a leader in professional development to advance the implementation of NHES by states and local school districts.
- The Society advocates improving school nutrition standards and promoting physical education requirements in schools. Together with the American Diabetes Association and the American Heart Association, the Society released statements of support for policy changes at state and local levels that promote quality health education and physical education in schools.
- ACS CAN currently collaborates with the National Alliance on Nutrition and Activity, Campaign to End Obesity, National Coalition for Promoting Physical Activity, Safe Routes to School National Partnership, and Preventive Health Partnership (the American Cancer Society, American Heart Association, and the American Diabetes Association) among others, to advance state and local policies to improve access to healthy nutritional options and increase opportunities for physical activity.
- ACS CAN advocates for federal and state policy on nutrition, physical activity, and obesity, including in 2010, providing comments on the draft of the 2010 *Dietary Guidelines for Americans*, the implementation of the menu labeling requirements in the Affordable Care Act, and recommendations for future obesity-related research at the National Institutes of Health.

The reauthorization of the federal child nutrition programs in 2010 provided another opportunity to improve federal nutrition and obesity policy. Congress reviews and reauthorizes the National School Lunch Program and other federal meal programs every five years, and with each reauthorization comes an opportunity to amend and strengthen these programs. Congress passed, and in December 2010 President Obama signed into law, the 2010 reauthorization of the Child Nutrition Act, which includes several provisions to improve nutrition and help fight obesity among our nation's children. The law will:

- Improve the nutritional quality of school meals and increase federal reimbursement for schools meeting updated federal nutrition standards.
- Set national nutrition standards for foods that are sold during the school day outside of school meal programs, such as foods in vending machines and food served in ala carte lines.
- Strengthen local wellness policies to include goals for nutrition education, physical activity, and other health-related activities.
- Support farm-to-school programs.

# Ultraviolet Radiation and Skin Cancer

The vast majority of skin cancers are caused by unprotected exposure to excessive ultraviolet radiation (UVR), primarily from the sun.<sup>115,116</sup> Stratospheric ozone depletion has exacerbated these health effects by allowing increased UVR to reach the Earth's surface.<sup>117</sup> The most serious form of skin cancer is melanoma, which is expected to be diagnosed in about 70,230 persons this year. There are two other forms of skin cancer – basal cell and squamous cell – that are highly curable; in 2006, more than 2 million people were treated for these skin cancers.<sup>1</sup> Most skin cancer deaths are due to melanoma (8,790 deaths expected in 2011). Melanoma is primarily a disease that afflicts whites; rates are more than 10 times higher in whites than in African Americans. The incidence of melanoma in the US has been increasing for at least 30 years<sup>1</sup>, in part due to changes in behavior that have resulted in increased exposure to solar UVR and use of indoor tanning booths by white young adult women.<sup>116,118</sup>

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

### *Risk factors for melanoma*<sup>1,116</sup>

- Personal or family history of melanoma
- Light skin or sun-sensitive (i.e., sunburning easily) skin types
- Presence of moles and freckles
- History of excessive sun exposure, including severe sunburn
- Exposure to indoor tanning booths occurring early in life

### *Risk factors for basal and squamous cell cancers*<sup>116</sup>

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

### *Measures to prevent skin cancer*<sup>130,131</sup>

- Avoid direct exposure to the sun between the hours of 10 a.m. and 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 adequately covers the arms, legs, and torso.
- Cover exposed skin with a sunscreen lotion with a sun protection factor (SPF) of 15 or higher.
- Avoid indoor tanning booths and sunlamps, which provide an additional source of non-solar UVR.

## Solar Ultraviolet Exposure

Everyone is exposed to naturally occurring solar UVR, although much of this exposure can be controlled. The extent of an individual's exposure to sunlight is determined by personal behaviors (e.g., sunbathing), as well as occupational circumstances. Environmental factors such as time of day, season, geographic location, altitude, temperature, and other weather conditions also affect the amount of solar radiation individuals receive.<sup>119</sup> The negative effects of UVR are cumulative over a lifetime. The immediate adverse effects of excessive UVR exposure include sunburn, eye damage, and suppression of the immune system, while the long-term effects include premature aging of the skin, wrinkles, and skin cancer. Personal exposure to UVR encompasses a large variety of behaviors during times of leisure, while at work or doing work around the house. In general, these behaviors have been grouped into two broad categories: intentional and non-intentional UVR exposures. Epidemiological studies show that cutaneous melanoma occurrence is associated more with intentional UVR exposure, which is motivated by the desire to acquire a tan by exposing significant portions of the trunk, shoulders, and limbs for extended periods of time (e.g., sunbathing and indoor tanning). Squamous cell carcinoma occurrence has been associated with non-intentional sun exposures that occur during daily outdoor activities in sunny conditions (e.g., gardening or outdoor workers). Basal cell carcinoma occurrence has been associated with both types of sun exposure.<sup>120</sup>

Sunburns typically occur as a result of excessive sun exposure on unprotected or poorly protected skin.<sup>116,119</sup> They are characterized by skin redness (erythema), which occurs three to five hours after UVR exposure. Depending on the extent of UVR exposure, sunburns can range from mild to blistering and painful. Sunburns during childhood and intense intermittent sun exposure increase the risk of melanoma and other skin cancers later in life.<sup>121-123</sup> A meta-analysis of 57 studies indicated a two-fold increased risk for melanoma among persons with a history of sunburn, compared to those without sunburn history.<sup>124</sup> The susceptibility of the skin to UVR damage, including sunburns, is higher among individuals with fair skin, a family history of skin cancer, the presence of moles and freckles, or a history of severe sunburns.<sup>116,122</sup> Individual strategies to help reduce UVR exposure include use of protective clothing and seeking the shade and use of broad-spectrum sunscreens as an adjunct form of sun protection. While sunscreen products used properly can provide protection from sunburns, skin can still be damaged by prolonged stays in the sun.<sup>119,125</sup> Moreover, where there is intentional UVR exposure without control of time spent in the sun (e.g., a day at the beach), sun seekers should be advised not to deliberately prolong their time in the sun regardless of having applied sunscreen. To minimize the harmful effects of excessive and unprotected sun exposure, sun protection behaviors should be a lifelong practice. (See sidebar.)

**Table 3A. Ultraviolet Radiation Exposure Behaviors, US High School Students and Adults 18 Years and Older, US, 2008, 2009**

| High School Students, 2009  | %     | %    | %      |
|-----------------------------|-------|------|--------|
|                             | Total | Male | Female |
| Apply sunscreen*            | 9.3   | 6.5  | 12.4   |
| Used indoor tanning device† | 15.6  | 6.7  | 25.4   |

| Adults, 2008‡               | %     | %    | %*     |
|-----------------------------|-------|------|--------|
|                             | Total | Male | Female |
| Apply sunscreen             | 32.6  | 21.4 | 43.4   |
| Wear a hat                  | 14.3  | 14.2 | 14.5   |
| Seek the shade              | 31.5  | 23.9 | 38.8   |
| Wear long-sleeved shirt     | 11.6  | 12.4 | 10.9   |
| Wear long pants             | 32.1  | 38.5 | 25.9   |
| Used indoor tanning device§ | 15.0  | 12.0 | 17.8   |

\*“Always” or “Most of the time” used sunscreen with an SPF of 15 or higher when outside for more than 1 hour on a sunny day. †Used an indoor tanning device, such as a sunlamp, sunbed, or tanning booth, one or more times during the 12 months before the survey. ‡“Always” or “Often” practiced sun protection behaviors on any warm, sunny day. §Used an indoor tanning device, including a sunbed, sunlamp, or tanning booth, at least once in the past 12 months.

**Source:** High school students: Youth Risk Behavior Surveillance System, 2009, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention. *MMWR Morb Mortal Wkly Rep.* Surveillance Summaries 2010;59(SS-5). Adults: National Health Interview Survey Public Use Data File 2008, National Center for Health Statistics, Centers for Disease Control and Prevention, 2009.

American Cancer Society, Surveillance Research, 2011

In an effort to provide consumers better information on the value and limits of sunscreen use, the Food and Drug Administration (FDA) is in the process of issuing a final monograph that will set standards for formulating, testing, and labeling over-the-counter sunscreen drug products with ultraviolet A radiation (UVA) and ultraviolet B radiation (UVB) protection, as both UVA and UVB rays can cause serious, long-term skin damage, and both contribute to skin cancer. For example, one of the proposed changes would modify the meaning of SPF from sun protection factor to sunburn protection factor to avoid the impression that high SPF sunscreens offer protection beyond that against sunburns.<sup>126</sup> It is important that users of sunscreen (particularly those at high risk) learn about proper selection of sunscreen types and application techniques. Adequate amounts of sunscreen should be applied 30 minutes to one hour prior to outdoor activities and re-applied after sweating, bathing, swimming, or accidental wiping away of sunscreen. In addition, sunscreen users are advised to not prolong their exposure time under the sun. For additional information, go to [cancer.org/docroot/SPC/content/SPC\\_1\\_Sun\\_Safety\\_101.asp](http://cancer.org/docroot/SPC/content/SPC_1_Sun_Safety_101.asp).

A small amount of solar UVR exposure is necessary for the production of vitamin D, which is essential for bone health.<sup>127,128</sup> There are two other ways to obtain vitamin D – dietary sources (particularly fortified milk and some cereals, oily fish, and eggs) and supplementation. The current national recommended daily

intake of vitamin D is 200 IU to 600 IU.<sup>129</sup> Research is under way to improve the understanding of vitamin D levels and their health effects, including the relationship with some cancers.<sup>127</sup>

## UVR Exposure Behaviors

UVR damage of unprotected skin should be minimized by limiting the amount of UVR exposure, by timing outdoor activities when UVR rays are less intense, by using protective clothing and applying adequate amounts of sunscreen, and by avoiding tanning booths and sunlamps. (See sidebar, page 29.)

Studies show that many adults and adolescents in the US do not regularly protect themselves when outdoors on sunny days.<sup>132-135</sup> In 2009, 9.3 percent of US high school students reported using sunscreen routinely; this estimate was the only sun-protection practice assessed at the time (Table 3A). In adults, national data show that 32.6% reported always or often using sunscreen when outside for an hour or more on a warm, sunny day in the past 12 months and 31.5% reported seeking shade, while fewer adults reported clothing protection behaviors, including using hats (14.3%) or long-sleeved shirts (11.6%) (Table 3A).

## Artificial Ultraviolet Radiation Exposure (Indoor Tanning)

A second source of exposure is artificial UVR emitted by devices (indoor tanning booths or lamps) that are increasingly available for cosmetic use and heavily promoted by the indoor tanning industry.<sup>136</sup> The International Agency for Research on Cancer listed UV-emitting indoor tanning devices as carcinogenic to humans. Studies show that use of indoor tanning devices is a risk factor for skin cancer.<sup>118,137-139</sup> An international comprehensive review reported that indoor tanning has no positive effect on health and found a 75% increase in melanoma risk among those who used indoor tanning booths in their teens and 20s.<sup>140</sup> Thus, additional exposure to artificial UVR from indoor tanning is likely to enhance the well-known detrimental consequences of excessive solar UVR exposure.<sup>140</sup>

The use of indoor tanning booths or sunlamps is particularly prevalent among young adults and women who perceive a tanned appearance as healthy and attractive.<sup>135,136</sup> Nationally in 2009, 25.4% of girls and 6.7% of boys reported using an indoor tanning booth in the previous year. Among US adults, 15% reported using indoor tanning (Table 3A). At the state level, 26 states have enacted legislation limiting minors’ access to indoor tanning facilities, including restricting access to use of tanning facilities by age or requiring parental permission<sup>141</sup> Of these states, four (California, Maine, New Jersey, and New York) prohibit minors under age 14 from using tanning facilities, while Wisconsin prohibits use by minors under age 16. A recent survey of indoor tanning facilities to assess compliance with minors’ access laws found that, while many (87%) said they require parental consent before a teen may indoor tan, 71% of establishments would allow

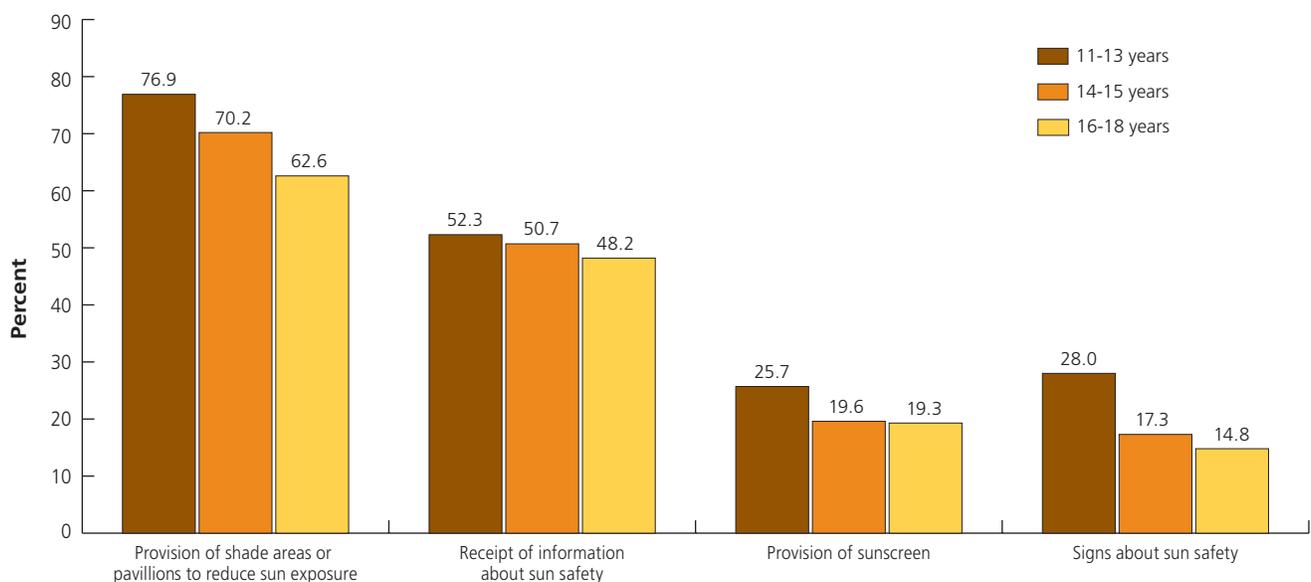
a teen to tan more often (every day on the first week of tanning) than the government's recommended limit of three times a week.<sup>142</sup> Both compliance with and enforcement of laws restricting the access of minors to indoor tanning facilities with minors' access laws is low.<sup>142,143</sup> Through its authority under the Tanning Accountability and Notification Act, the FDA regulates tanning devices (e.g., booths, sunbeds, or sunlamps) and enforces warning labels on indoor tanning devices to make sure consumers are effectively warned of the known dangers of indoor tanning, including the risk of skin cancer. Parents and adolescents alike need to be educated on the risks of using indoor tanning devices, and the tanning industry needs to be effectively regulated to protect public health.

## Prevention Strategies in Skin Cancer

Sun protection practices among adults and youth have improved little during the past decades despite efforts to educate the public about the harms from excessive sun exposure and the benefits of sun protection.<sup>134</sup> While education is important, more systematic efforts are needed to affect broader changes in behavior practices to improve and enable skin cancer preventive practices.<sup>134,144,145</sup> Since children and adolescents are an important target group for skin cancer prevention, the Centers for Disease Control and Prevention (CDC) recommends developing comprehensive programs that include school intervention components, including physical, social, and organizational environments that promote

UVR protection, and educating young persons about sun safety.<sup>131,144,146</sup> However, a CDC assessment of School Health Policies and Programs indicated low adoption of sun-safety policies (e.g., scheduling outdoor activities during the day when the sun is not at peak intensity) in elementary, junior/middle, or senior high schools.<sup>147</sup> Moreover, the extent of adoption of school sun-safety policies may vary by geography and school grade. A 2004 national survey of adolescents aged 11 to 18 found that greater proportions of younger adolescents were aware of sun safety policies in their school, sports program, camp, or swimming pools than older youth (Figure 3A). About 50% reported receiving sun-safety information, 69.7% reported the provision of shade areas or pavilions to reduce sun exposure, 21.7% reported provision of sunscreen, and 20.2% reported exposure to sun-safety signs. In states where UVR exposure is high year round, parents should work with schools to develop sun-protection programs at all grade levels and to establish proper protection practices for their own children. The SunWise School Program, a cost-effective, school-based education program established by the Environmental Protection Agency, can provide multiple resources to teach children and their families to protect themselves from overexposure to the sun through the use of classroom-, school-, and community-based components. (More information is available at [epa.gov/sunwise/](http://epa.gov/sunwise/).) The evidence supporting primary skin cancer prevention in health care settings is limited.<sup>145</sup> According to a recent study by the American Cancer Society, about half of US adolescents and their parents in 2004 reported being told by a physician to

**Figure 3A. Sun Safety Promotion in Schools, Sports, or Recreational Settings\*, by Age Group, US Adolescents, 2004**



\*US adolescents' self-report of sun safety policies in school, sports program, camp, or swimming pools.

Source: American Cancer Society Sun Survey II, 2004.

American Cancer Society, Surveillance Research, 2011



in adults' covering-up behavior, had multiple strategies including providing educational materials on sun safety by outdoor recreation staff and providing additional shaded areas and/or sunscreen. Even though workers in certain outdoor occupational settings are at a high risk for nonmelanoma skin cancers because of chronic and intense UVR exposure, the Task Force on Community Preventive Services concluded that the evidence supporting interventions in occupational settings is insufficient due to scant and inconsistent findings.<sup>151</sup> Evidence from the Pool Cool intervention program targeting lifeguards and aquatic instructors in pools across the US suggests that interventions to improve sun safety and reduce sunburns in occupational settings may benefit from a multicomponent framework that targets individuals' behaviors and workplace organizational and social environments, including policies supporting sun-safety and social changes promoting sun-safety norms.<sup>152</sup> State and local health departments and voluntary health organizations interested in playing a role in skin cancer prevention can use the Community Guide resources available at [cancercontrolplanet.cancer.gov/sun\\_safety.html](http://cancercontrolplanet.cancer.gov/sun_safety.html).

### Early Detection of Skin Cancer

The early signs of skin cancer include changes in the surface of a mole or a new appearance of skin growths.<sup>153</sup> Suspicious growths (or lesions) or a progressive change in a lesion's appearance (size, shape, color, etc.) should be evaluated promptly by a physician. Melanomas often start as small, mole-like growths that increase in size and may change color. A simple ABCD rule outlines the warning signals of the most common type of melanoma: A is for asymmetry (one half of the mole does not match the other half); B is for border irregularity (the edges are ragged, notched, or blurred); C is for color (the pigmentation is not uniform, with variable degrees of tan, brown, or black); D is for diameter greater than six millimeters (about the size of a pencil eraser). Other types of melanoma may not have these signs, so individuals are encouraged to be alert for any new or changing skin growths.

Individuals at high risk for skin cancer should undergo periodic screening by a trained provider. Screening examinations consist of a total body skin examination to look for new or changing skin lesions. Education about signs and symptoms and identification of high-risk individuals should occur during a preventive periodic visit or checkup.<sup>153</sup> (For more information about skin cancer prevention and early detection, go to [cancer.org/docroot/SPC/content/SPC\\_1\\_Sun\\_Safety\\_101.asp](http://cancer.org/docroot/SPC/content/SPC_1_Sun_Safety_101.asp).)

practice sun protection.<sup>148</sup> Physician communication to practice sun safety was associated with increased use of sunscreen and proper sunscreen application practices among adolescents and increased insistence among parents that their children practice regular sunscreen use.<sup>148</sup> However, parents of US adolescents themselves were found to practice sun protection behaviors at low rates, and nearly one in two experience summer sunburns.<sup>149</sup> Therefore, health care professionals, including pediatricians, may play an important role in educating their patients and parents about the importance of skin cancer prevention. More studies are needed to evaluate interventions in the medical settings.<sup>150</sup>

A review by the Task Force on Community Preventive Services found evidence of effective community programs in two settings: primary schools and recreation/tourism.<sup>145</sup> The interventions evaluated in primary schools had an educational and policy emphasis and showed an increase in children's sun protection behavior, specifically, wearing protective clothing and hats. The interventions in recreation/tourism, which showed an increase

# Cancer Screening

Early detection of cancer through screening has been shown to reduce mortality from cancers of the colon and rectum, breast, and uterine cervix. Screening refers to testing in individuals who are asymptomatic for a particular disease (i.e., they have no symptoms that may indicate the presence of disease). In addition to detecting cancer early, screening for colorectal or cervical cancers can identify and result in the removal of precancerous abnormalities, preventing cancer altogether.<sup>153</sup> Following the recommendations for cancer screening from the American Cancer Society is an important complement to healthy behaviors that reduce the risk of developing and dying from cancer.

The American Cancer Society screening guidelines for average-risk individuals recommend that women begin annual screening for cervical cancer at age 21 (or 3 years after first intercourse, whichever comes first), mammography at age 40, and that all adults age 50 years and older be screened periodically for colorectal cancer. Screening guidelines for these three cancers further vary by underlying risk and screening test results over time. At present, there is insufficient evidence to recommend for or against prostate cancer screening. The American Cancer Society recommends that asymptomatic men who have at least a 10-year life expectancy have an opportunity to make an informed decision with their health care provider about whether to be screened for prostate cancer after receiving information about the uncertainties, risks, and potential benefits associated with prostate cancer screening.<sup>154</sup> The National Lung Screening Trial (NLST) recently reported a 20% greater reduction in lung cancer deaths in a study comparing screening with low-dose helical computed tomography (CT) versus chest x-ray in a group of current or former heavy smokers.<sup>155</sup> The full results of the study have not been published and thus a determination has not yet been made as to whether screening in adults at high risk for lung cancer will be recommended. The American Cancer Society screening guidelines for the early detection of cancer are shown on page 34.

Improving access to and utilization of cancer screening is a key part of the Society's efforts to help people stay well. The Society and many other public health advocates consider health care reform necessary because the 50 million individuals in the US who lack health insurance experience barriers to appropriate health care, including preventive services such as cancer screening. In March 2010, Congress passed and the president signed comprehensive health care reform legislation. While not a cure-all, health care reform legislation is a critical component for improving access to care. The American Cancer Society Cancer Action Network (ACS CAN), the Society's nonprofit, nonpartisan advocacy affiliate, has worked diligently with multiple partners in advocating for comprehensive health reform legislation to

improve access to timely, effective, and high-quality prevention, detection, and cancer treatment services.

## Breast Cancer Screening

Breast cancer screening has been shown to reduce breast cancer mortality.<sup>153</sup> In the US, death rates from breast cancer in women have been declining since 1990, due in part to early detection by mammography screening and improvements in treatment.<sup>1</sup> Currently, 60% of breast cancers are diagnosed at a localized stage, for which the five-year survival rate is 98%.<sup>156</sup> Further reductions in breast cancer death rates are possible by improving regular use of mammography screening and providing timely access to high-quality follow up and treatment. The American Cancer Society played a key role in the early research to demonstrate the feasibility of mass screening for breast cancer, joining forces with the National Cancer Institute on the nationwide Breast Cancer Detection Demonstration Project. The Society also provided support to the American College of Radiology to initiate the organization's Mammography Accreditation Program to improve the quality of mammography.

Despite the relatively high prevalence of mammography screening in the US (within the past 2 years: 67.1% in 2008, Table 4A, page 36), studies suggest that many women are initiating mammography later than recommended, not having mammography at recommended intervals,<sup>157</sup> or not receiving appropriate and timely follow up of positive screening results.<sup>158-160</sup> These indicators of inadequate screening are associated with more advanced tumor size and stage at diagnosis.<sup>158-160</sup> The American Cancer Society screening guidelines recommend that average-risk women aged 40 and older receive mammography screening on an annual basis. There is no specific upper age at which mammography screening should be discontinued. Rather, the decision to stop regular mammography screening should be made on an individual basis based on the potential benefits and risks of screening within the context of a patient's overall health status and estimated longevity. Women should be informed of the scientific evidence demonstrating the value of detecting breast cancer before symptoms develop and the importance of adhering to a schedule of regular mammograms. Also, women should be told about the limitations of mammography, specifically that mammography will not detect all breast cancers, some breast cancers detected with mammography may still have poor prognosis, and a small percentage of breast neoplasms detected by screening, particularly ductal carcinoma in situ, are not progressive and thus may be treated unnecessarily. Further, women should be informed about the potential for false-positive results and the possibility of undergoing a biopsy for abnormalities that prove to be benign, as well as the possibility of over-treatment, e.g., treating a breast cancer that would not have progressed to cause harm.<sup>153</sup> It is the position of the American Cancer Society that the balance of benefits to possible harms strongly supports the value of breast cancer screening.

## Screening Guidelines for the Early Detection of Cancer in Average-risk Asymptomatic People

| Cancer Site                           | Population  | Test or Procedure   | Frequency   |
|---------------------------------------|---|---|---|
| <b>Breast</b>                         | Women, age 20+  | Breast self-examination   | Beginning in their early 20s, women should be told about the benefits and limitations of breast self-examination (BSE). The importance of prompt reporting of any new breast symptoms to a health professional should be emphasized. Women who choose to do BSE should receive instruction and have their technique reviewed on the occasion of a periodic health examination. It is acceptable for women to choose not to do BSE or to do BSE irregularly.   |
|                                       |   | Clinical breast examination   | For women in their 20s and 30s, it is recommended that clinical breast examination (CBE) be part of a periodic health examination, preferably at least every three years. Asymptomatic women aged 40 and over should continue to receive a clinical breast examination as part of a periodic health examination, preferably annually.   |
|                                       |   | Mammography   | Begin annual mammography at age 40.*  |
| <b>Colorectal<sup>†</sup></b>         | Men and women, age 50+  | <b>Tests that find polyps and cancer:</b>   |   |
|                                       |   | Flexible sigmoidoscopy, <sup>‡</sup> or   | Every five years, starting at age 50  |
|                                       |   | Colonoscopy, or   | Every 10 years, starting at age 50  |
|                                       |   | Double-contrast barium enema (DCBE), <sup>‡</sup> or  | Every five years, starting at age 50  |
|                                       |   | CT colonography (virtual colonoscopy) <sup>‡</sup>  | Every five years, starting at age 50  |
| <b>Tests that mainly find cancer:</b> | Annual, starting at age 50  |   |   |
|                                       | Fecal occult blood test (FOBT) with at least 50% test sensitivity for cancer, or fecal immunochemical test (FIT) with at least 50% test sensitivity for cancer <sup>‡§</sup> or |   |   |
|                                       | Stool DNA test (sDNA) <sup>‡</sup>  | Interval uncertain, starting at age 50  |   |
| <b>Prostate</b>                       | Men, age 50+  | Prostate-specific antigen test (PSA) with or without digital rectal exam (DRE)  | Asymptomatic men who have at least a 10-year life expectancy should have an opportunity to make an informed decision with their health care provider about screening for prostate cancer after receiving information about the uncertainties, risks, and potential benefits associated with screening. Prostate cancer screening should not occur without an informed decision making process <sup>¶</sup> .  |
| <b>Cervix</b>                         | Women, age 18+  | Pap test  | Cervical cancer 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 conventional Pap tests or every two years using liquid-based Pap 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 with cervical cytology (either conventional or liquid-based Pap test) alone, or every three years with an HPV DNA test plus cervical cytology. Women 70 years of age and older who have had three or more normal Pap tests and no abnormal Pap tests in the past 10 years and women who have had a total hysterectomy may choose to stop cervical cancer screening. |
| <b>Endometrial</b>                    | Women, at menopause   | At the time of menopause, women at average risk should be informed about risks and symptoms of endometrial cancer and strongly encouraged to report any unexpected bleeding or spotting to their physicians.  |   |
| <b>Cancer-related checkup</b>         | Men and women, age 20+  | On the occasion of a periodic health examination, the cancer-related checkup should include examination for cancers of the thyroid, testicles, ovaries, lymph nodes, oral cavity, and skin, as well as health counseling about tobacco, sun exposure, diet and nutrition, risk factors, sexual practices, and environmental and occupational exposures. |   |

\* Beginning at age 40, annual clinical breast examination should be performed prior to mammography.

<sup>†</sup> Individuals with a personal or family history of colorectal cancer or adenomas, inflammatory bowel disease, or high-risk genetic syndromes should continue to follow the most recent recommendations for individuals at increased or high risk.

<sup>‡</sup> Colonoscopy should be done if test results are positive.

<sup>§</sup> For FOBT or FIT used as a screening test, the take-home multiple sample method should be used. A FOBT or FIT done during a digital rectal exam in the doctor's office is not adequate for screening.

<sup>¶</sup> Information should be provided to men about the benefits and limitations of testing so that an informed decision can be made with the clinician's assistance.

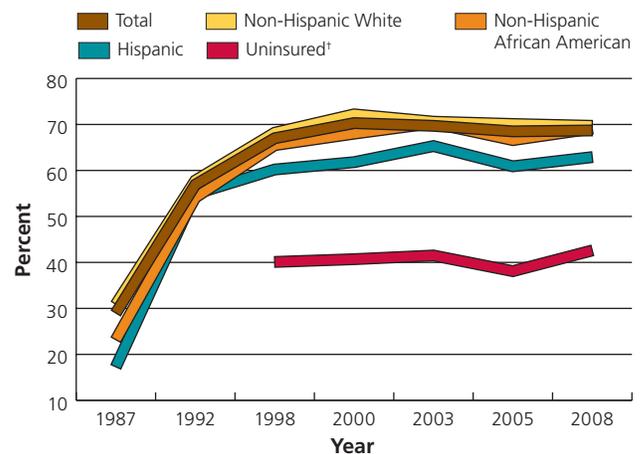
Scientific knowledge of how to identify women at increased risk of breast cancer is enabling the development of tools for risk assessment for clinical practice.<sup>153,161</sup> For women at high risk for breast cancer, the Society recommends annual screening using magnetic resonance imaging (MRI) in addition to mammograms beginning at age 30; the high-risk status of these women (lifetime risk approximately 20%-25% or greater) is based on the presence of mutations in the breast cancer susceptibility genes, BRCA1 and BRCA2; strong family history of breast and/or ovarian cancer; or prior chest radiation therapy (e.g., for Hodgkin disease).<sup>162</sup> In addition to MRI screening as an adjunct to mammography and screening at an earlier age, interventions offered to women at increased risk of breast cancer include chemoprevention with tamoxifen or raloxifene (two FDA-approved drugs), genetic counseling, and among women with BRCA1 and BRCA2 mutations, surgical options.<sup>163</sup> Recent assessments about the diffusion of breast cancer risk assessment in clinical care suggest that it is less than optimal; therefore, greater efforts are needed to encourage health care providers to use available tools and facilitate their incorporation into practice to ensure that many more eligible patients benefit from risk reduction strategies.<sup>161,163</sup>

### Mammography Screening in the US

National breast cancer screening data are available from the National Health Interview Survey (NHIS), that measures screening within the past year and past two years. The NHIS has tracked trends in mammography since 1987.<sup>164</sup>

- The percentage of women aged 40 years and older who reported having a mammogram within the past two years increased from 29% in 1987 to 70% in 2000; thereafter, it has remained relatively stable (67.1% in 2008). Also, while mammography rates improved in all race and ethnicity groups during this period, they remained persistently low in uninsured women (Figure 4A).
- Both white and African American women aged 40 and older reported similar prevalence of having a mammogram in the past two years (about 68%); however, in women of other racial/ethnic groups, the prevalence of mammography screening is lower: 55.3% in American Indian/Alaska Native women, 61.5% in Hispanic women, and 65.1% in Asian women (Table 4A, page 36; Figure 4A).
- The lowest prevalence of mammography use in the past two years occurred among women who lack health insurance (35.6%), followed by immigrant women who have lived in the US for fewer than 10 years (49.7%) (Table 4A, page 36).
- Only 53% of women aged 40 and older reported having a mammogram within the past year (Table 4A, page 36). The American Cancer Society recommends annual mammograms for women starting at age 40.

**Figure 4A. Mammography within the Past Two Years\*, Women 40 and Older, among Race/Ethnic Categories and the Uninsured†, US, 1987-2008**



\*Estimates for race and ethnic groups are age adjusted to the 2000 US standard population. †Estimates for the uninsured group are for women 40 to 64 years and are not age adjusted.

Source: 1987-2003: National Cancer Institute. Cancer Trends Progress Report – 2007 Update. Available at [progressreport.cancer.gov](http://progressreport.cancer.gov). Accessed September 10, 2009. Centers for Disease Control and Prevention, National Center for Health Statistics, Health, United States, 2008, With Special Feature on the Health of Young Adults. Hyattsville, Maryland: 2009. 2005, 2008: National Health Interview Survey Public Use Data File 2005, 2008, National Center for Health Statistics, Centers for Disease Control and Prevention, 2006, 2009.

American Cancer Society, Surveillance Research, 2011

### State-level Mammography Screening

Current state-level breast cancer screening data are available from the 2008 Behavioral Risk Factor Surveillance System:

- In 2008, the percentage of women aged 40 and older who reported having a mammogram in the past year ranged from 49.9% in Utah to 72.8% in Massachusetts (Table 4B, page 37).
- Utah is the only state that does not have legislation to improve private insurance coverage for mammography screening; Utah has the lowest prevalence of mammography screening.<sup>165</sup>
- Screening participation rates are approximately 7% to 9% points lower when measuring the percentage of women who had a mammogram *and* clinical breast exam, ranging from 40.8% in Utah to 64.7% 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 (Table 4B, page 37).

There is a need for continued efforts to increase mammography utilization. For the most recent period, between 2005 and 2008, the US trend in mammography utilization has remained stable

**Table 4A. Mammography, Women 40 and Older, US, 2008**

| Characteristic                                | % Mammogram within the past year* | % Mammogram within the past 2 years* |
|---|-----------------------------------|--------------------------------------|
| <b>Age</b>                                    |                                   |                                      |
| 40-49   | 47.3                              | 61.5                                 |
| 50-64   | 58.6                              | 74.2                                 |
| 65+   | 53.2                              | 65.4                                 |
| <b>Race/ethnicity</b>                         |                                   |                                      |
| Hispanic/Latino                               | 46.8                              | 61.5                                 |
| White (non-Hispanic)                          | 54.2                              | 68.0                                 |
| African American (non-Hispanic)               | 52.2                              | 67.7                                 |
| American Indian/Alaska Native† (non-Hispanic) | 42.2                              | 55.3                                 |
| Asian American‡ (non-Hispanic)                | 52.2                              | 65.1                                 |
| <b>Education (years)</b>                      |                                   |                                      |
| 11 or fewer                                   | 40.1                              | 53.9                                 |
| 12  | 49.2                              | 64.3                                 |
| 13-15   | 55.2                              | 69.1                                 |
| 16 or more                                    | 64.5                              | 77.9                                 |
| <b>Health insurance coverage</b>              |                                   |                                      |
| No  | 26.0                              | 35.6                                 |
| Yes   | 56.2                              | 70.5                                 |
| <b>Immigration§</b>                           |                                   |                                      |
| Born in US                                    | 53.5                              | 67.6                                 |
| Born in US territory                          | 49.6                              | 63.6                                 |
| In US fewer than 10 years                     | 39.6                              | 49.7                                 |
| In US 10+ years                               | 51.8                              | 65.8                                 |
| <b>Total</b>                                  | 53.0                              | 67.1                                 |

\*Percentages are age adjusted to the 2000 US standard population. See Statistical Notes for more information. †Estimates should be interpreted with caution because of the small sample sizes. ‡Does not include Native Hawaiians and other Pacific Islanders. §Definition has changed such that individuals born in the US or in a US territory are reported separately from individuals born outside the US. Individuals born in a US territory have been in the US for any length of time.

**Source:** National Health Interview Survey Public Use Data File 2008, National Center for Health Statistics, Centers for Disease Control and Prevention, 2009.

American Cancer Society, Surveillance Research, 2011

(Figure 4A, page 35).<sup>166</sup> In order to further reduce breast cancer mortality, it is important to improve access to screening; rates of mammography use continue to be low among those with low income levels, recent immigrants, and individuals who lack health insurance coverage.<sup>166,167</sup> Access barriers to screening may lead to more advanced stage breast cancer diagnosis and poorer survival.<sup>158,168</sup> Programs and policies that both promote and enable access to mammography screening for low-income uninsured and underinsured women need to be enhanced and supported.<sup>169</sup>

## Cervical Cancer Screening

Cervical cancer incidence and mortality rates have decreased 67% over the past three decades, with most of the reduction

attributed to the Pap test, which detects cervical cancer and precancerous lesions.<sup>170</sup> Between 60% and 80% of women with advanced cervical cancer have not had a Pap test in the past five years.<sup>171</sup> For women in whom precancerous lesions have been detected through Pap tests, the likelihood of survival is nearly 100% with appropriate evaluation, treatment, and follow up.<sup>171</sup> Historically, the American Cancer Society played a critical role in developing and promoting the use of the Pap test. Cervical cancer is now one of the most successfully controlled cancers in developed countries.<sup>170</sup> With the approved vaccine for immunization against the human papillomavirus (HPV) in young girls, there is a great potential for further reducing the occurrence of cervical cancer in the US. In developing countries, where the burden of cervical cancer is high, the control of cervical cancer through screening and prevention via HPV vaccines is a priority. At present, most developing countries have limited capacity for cervical cancer screening, and the cost of the HPV vaccine and logistics is a significant barrier for implementing vaccine programs in the short term.<sup>172</sup>

## HPV Vaccine and Cervical Cancer (and Vulvar Cancer) Prevention

HPV is the most common sexually transmitted infection in the US, with approximately 6.2 million people becoming newly infected annually.<sup>173</sup> There are more than 100 types of HPV, more than 40 of which can infect the genitals. Although most HPV infections are benign and transient, virtually all cervical cancers are causally related to infections by HPV. Approximately 70% of cervical cancers are caused by HPV types 16 or 18.<sup>170</sup> Vaccines have been developed against HPV-16 and HPV-18 and other subtypes. Recent clinical trials show that the vaccines are effective in preventing persistent new infections<sup>174</sup> and in reducing rates of precursor lesions (adenoma in situ or intraepithelial neoplasia) in the cervix.<sup>175,176</sup> Made from non-infectious HPV-like particles, these vaccines offer a promising new approach to the prevention of cervical cancer, as well as other HPV-associated conditions (e.g., vulvar, anal, and oral cancers and genital warts).<sup>173</sup>

In June 2006, a vaccine (Gardasil) that protects against four types of HPV, including types 16 and 18, was approved by the FDA for use in females aged 9 to 26. In October 2009, the FDA approved a second HPV vaccine (Cervarix) and expanded the approval of Gardasil for use in boys and young men, aged 9 to 26 years, to prevent genital warts and anal cancer. Males can carry HPV and transmit it to their partners, and HPV can cause genital warts and penile and anal cancer in men.<sup>177</sup> The Advisory Committee on Immunization Practices (ACIP), the federal entity charged with making recommendations for the administration of vaccines to the pediatric and adult populations, voted against routine vaccination of males in favor of “permissive use,” which leaves the decision to the discretion of providers and patients. At present, the American Cancer Society has no recommendation regarding the use of HPV vaccine in males.

**Table 4B. Mammography and Clinical Breast Exam, Women 40 and Older, by State, US, 2008**

|                      | % 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              | 57.5                | 56.0           | 60.6               | 29.2                             | 28.1                 | 48.3   | 49.6           | 45.5               | 25.1                             | 22.0                 |
| Alaska               | 54.2                | 53.2           | 58.3               | 30.2                             | 31.8                 | 47.2   | 46.9           | 48.6               | 26.0                             | 29.9                 |
| Arizona              | 61.2                | 57.1           | 69.3               | 37.3                             | 36.0                 | 53.2   | 51.6           | 56.3               | 33.4                             | 33.5                 |
| Arkansas             | 56.3                | 53.6           | 61.8               | 28.2                             | 25.9                 | 48.3   | 48.5           | 47.8               | 25.2                             | 23.5                 |
| California           | 63.9                | 62.7           | 67.1               | 44.2                             | 43.3                 | 53.9   | 54.4           | 52.5               | 36.0                             | 37.3                 |
| Colorado             | 57.6                | 55.8           | 63.1               | 24.9                             | 29.1                 | 50.4   | 50.4           | 50.5               | 18.4                             | 25.0                 |
| Connecticut          | 70.9                | 71.6           | 69.3               | 41.0                             | 43.7                 | 62.7   | 66.3           | 54.3               | 30.9                             | 35.9                 |
| Delaware             | 69.8                | 69.9           | 69.4               | 44.9                             | 42.7                 | 61.1   | 64.0           | 54.5               | 38.2                             | 37.3                 |
| District of Columbia | 62.9                | 60.5           | 68.0               | 34.4                             | 35.8                 | 56.5   | 55.2           | 59.3               | 30.7                             | 31.5                 |
| Florida              | 65.6                | 62.8           | 70.8               | 41.4                             | 38.4                 | 56.2   | 56.5           | 55.7               | 33.6                             | 32.0                 |
| Georgia              | 65.5                | 65.0           | 66.8               | 39.8                             | 34.4                 | 57.9   | 59.7           | 52.9               | 36.7                             | 31.8                 |
| Hawaii               | 63.5                | 63.3           | 64.0               | 39.4                             | 29.1                 | 51.7   | 53.8           | 47.5               | 32.2                             | 26.1                 |
| Idaho                | 53.9                | 51.9           | 59.0               | 27.6                             | 29.0                 | 48.3   | 47.8           | 49.7               | 23.8                             | 26.5                 |
| Illinois             | 60.2                | 59.4           | 61.9               | 32.0                             | 42.3                 | 51.5   | 52.7           | 48.7               | 26.8                             | 38.7                 |
| Indiana              | 58.1                | 56.6           | 61.5               | 26.6                             | 29.2                 | 49.2   | 50.5           | 46.1               | 22.9                             | 24.5                 |
| Iowa                 | 62.9                | 61.1           | 66.2               | 28.6                             | 29.4                 | 55.1   | 55.9           | 53.5               | 24.5                             | 26.9                 |
| Kansas               | 61.6                | 59.9           | 65.3               | 29.9                             | 26.1                 | 53.3   | 54.5           | 50.5               | 26.2                             | 21.6                 |
| Kentucky             | 59.3                | 58.5           | 61.3               | 31.2                             | 39.3                 | 50.4   | 51.8           | 47.3               | 25.2                             | 32.1                 |
| Louisiana            | 64.3                | 63.1           | 67.1               | 37.9                             | 45.9                 | 55.0   | 55.6           | 53.4               | 32.8                             | 39.2                 |
| Maine                | 69.9                | 67.7           | 74.7               | 32.5                             | 34.3                 | 61.8   | 62.2           | 61.1               | 28.3                             | 32.3                 |
| Maryland             | 61.8                | 60.2           | 65.9               | 24.2                             | 27.2                 | 53.4   | 53.1           | 54.1               | 18.7                             | 22.3                 |
| Massachusetts        | 72.8                | 72.5           | 73.5               | 48.2                             | 58.6                 | 64.7   | 66.2           | 61.2               | 40.7                             | 51.2                 |
| Michigan             | 63.6                | 62.2           | 66.9               | 26.0                             | 37.9                 | 56.9   | 57.3           | 55.8               | 20.7                             | 31.8                 |
| Minnesota            | 62.0                | 61.5           | 63.3               | 30.9                             | 27.5                 | 56.6   | 57.0           | 55.5               | 25.9                             | 24.7                 |
| Mississippi          | 55.2                | 54.2           | 57.5               | 29.1                             | 29.0                 | 47.4   | 48.2           | 45.5               | 22.6                             | 22.9                 |
| Missouri             | 56.7                | 54.6           | 61.2               | 25.8                             | 24.6                 | 48.3   | 48.6           | 47.5               | 24.3                             | 21.0                 |
| Montana              | 56.6                | 54.8           | 60.4               | 34.5                             | 29.9                 | 50.4   | 50.8           | 49.3               | 28.8                             | 25.0                 |
| Nebraska             | 57.7                | 57.7           | 57.8               | 28.2                             | 29.9                 | 50.3   | 52.3           | 46.1               | 20.9                             | 27.3                 |
| Nevada               | 54.5                | 53.4           | 57.3               | 21.9                             | 26.5                 | 44.1   | 45.4           | 41.0               | 18.2                             | 19.6                 |
| New Hampshire        | 67.9                | 67.1           | 69.9               | 31.2                             | 38.2                 | 60.7   | 62.2           | 57.0               | 26.6                             | 34.3                 |
| New Jersey           | 62.7                | 63.0           | 62.1               | 37.1                             | 38.0                 | 55.0   | 58.0           | 47.9               | 32.3                             | 32.7                 |
| New Mexico           | 54.4                | 52.9           | 57.9               | 27.6                             | 26.2                 | 47.4   | 47.2           | 47.7               | 25.1                             | 24.2                 |
| New York             | 65.4                | 64.3           | 67.8               | 37.8                             | 42.8                 | 58.1   | 58.6           | 57.0               | 27.3                             | 32.3                 |
| North Carolina       | 64.4                | 62.7           | 68.2               | 36.9                             | 36.3                 | 56.5   | 56.9           | 55.4               | 32.5                             | 32.1                 |
| North Dakota         | 63.6                | 60.8           | 69.0               | 35.9                             | 39.4                 | 56.6   | 56.4           | 57.0               | 28.1                             | 34.3                 |
| Ohio                 | 61.2                | 60.2           | 63.3               | 30.2                             | 28.8                 | 52.3   | 54.5           | 47.6               | 28.0                             | 25.5                 |
| Oklahoma             | 50.9                | 49.5           | 53.8               | 23.3                             | 22.5                 | 42.0   | 42.9           | 40.0               | 18.8                             | 19.2                 |
| Oregon               | 61.7                | 60.2           | 65.0               | 26.7                             | 26.2                 | 51.6   | 51.7           | 51.4               | 21.7                             | 19.8                 |
| Pennsylvania         | 62.8                | 62.7           | 63.0               | 32.5                             | 38.2                 | 54.0   | 56.4           | 49.3               | 22.9                             | 30.3                 |
| Rhode Island         | 69.2                | 69.0           | 69.6               | 44.2                             | 51.3                 | 62.0   | 63.5           | 58.8               | 33.2                             | 41.2                 |
| South Carolina       | 58.9                | 56.7           | 63.6               | 21.3                             | 31.2                 | 49.7   | 49.6           | 50.0               | 16.3                             | 23.1                 |
| South Dakota         | 63.4                | 60.7           | 68.7               | 30.3                             | 30.3                 | 54.8   | 54.8           | 54.8               | 25.1                             | 25.2                 |
| Tennessee            | 58.0                | 56.4           | 61.8               | 36.8                             | 33.1                 | 51.1   | 51.6           | 49.6               | 32.9                             | 29.7                 |
| Texas                | 57.8                | 56.4           | 61.6               | 34.3                             | 38.9                 | 50.4   | 50.6           | 49.8               | 28.6                             | 33.0                 |
| Utah                 | 49.9                | 48.7           | 53.1               | 30.7                             | 25.2                 | 40.8   | 40.5           | 41.7               | 24.5                             | 17.4                 |
| Vermont              | 67.6                | 67.2           | 68.7               | 27.6                             | 47.7                 | 59.0   | 60.3           | 55.8               | 26.2                             | 41.7                 |
| Virginia             | 64.2                | 63.0           | 67.3               | 36.9                             | 37.1                 | 56.7   | 57.3           | 55.1               | 33.2                             | 34.8                 |
| Washington           | 60.5                | 58.4           | 66.1               | 29.7                             | 32.6                 | 51.3   | 51.5           | 50.7               | 25.4                             | 28.7                 |
| West Virginia        | 60.4                | 59.4           | 62.3               | 31.5                             | 35.3                 | 52.0   | 53.8           | 48.4               | 28.0                             | 33.4                 |
| Wisconsin            | 62.9                | 61.0           | 67.4               | 22.8                             | 34.5                 | 57.1   | 56.8           | 57.9               | 16.2                             | 32.1                 |
| Wyoming              | 52.0                | 51.1           | 54.1               | 29.1                             | 23.0                 | 43.9   | 45.3           | 40.3               | 23.3                             | 21.2                 |
| United States¶       | 62.1                | 60.7           | 65.1               | 35.0                             | 36.4                 | 53.8   | 54.5           | 51.9               | 29.2                             | 31.1                 |
| Range                | 49.9-72.8           | 48.7-72.5      | 53.1-74.7          | 21.3-48.2                        | 22.5-58.6            | 40.8-64.7                                    | 40.5-66.3      | 40-61.2            | 16.2-40.7                        | 17.4-51.2            |

\*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 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. ¶See Statistical Notes for definition.

**Source:** Behavioral Risk Factor Surveillance System 2008, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2009. American Cancer Society, Surveillance Research, 2011

## Recommendations for HPV Vaccine Use to Prevent Cervical Cancer and Its Precursors<sup>181</sup>

- Routine HPV vaccination is recommended for females aged 11 to 12.
- Females as young as age 9 may receive HPV vaccination.
- The HPV vaccination is also recommended for females aged 13 to 18 to catch up on missed vaccine or complete the vaccination series.
- There are currently insufficient data\* to recommend for or against universal vaccination of females aged 19 to 26 in the general population. A decision about whether a woman aged 19 to 26 should receive the vaccine should be based on an informed discussion between the woman and her health care provider regarding her risk of previous HPV exposure and potential benefit from vaccination. Ideally, the vaccine should be administered prior to potential exposure to genital HPV through sexual intercourse, because the potential benefit is likely to diminish with the increasing number of lifetime sexual partners.
- The HPV vaccination is not currently recommended for women over age 26.
- Screening for cervical intraepithelial neoplasia (CIN) and cancer should continue in both vaccinated and unvaccinated women according to current Society early detection guidelines.

\*Insufficient evidence of benefit in women aged 19 to 26 refers to (1) clinical trial data in women with an average of two – and not more than four – lifetime sexual partners, indicating a limited reduction in the overall incidence of CIN2/3; (2) the absence of efficacy data for the prevention of HPV 16/18 related CIN2/3 in women who have had more than four lifetime sexual partners; and (3) the questionable cost-effectiveness of vaccination in this age group.

The HPV vaccine is administered in 3 doses over the course of 1 year. To be most effective, it should be given before a person becomes sexually active. The ACIP recommended that the vaccine be routinely given to females aged 11 to 12 years and as early as age 9 years at the discretion of doctors. The committee also recommended females aged 13 to 26 who have not yet been vaccinated receive “catch-up” vaccinations.<sup>178,179</sup> Based on ongoing assessments of vaccine safety information,<sup>180</sup> the FDA and Centers for Disease Control and Prevention (CDC) continue to find that both vaccines are safe and the side effects, which include pain or tenderness at the injection site, are mild.<sup>179</sup> In January 2007, the Society published its own recommendations for HPV vaccine use, which are generally consistent with those of the ACIP.<sup>181</sup> (See sidebar.)

The HPV vaccine cost in the US is approximately \$130 per dose (or \$390 for the entire three-dose series during one year). This cost does not include the cost for giving the injections or the doctor’s charge. However, most large health insurance companies

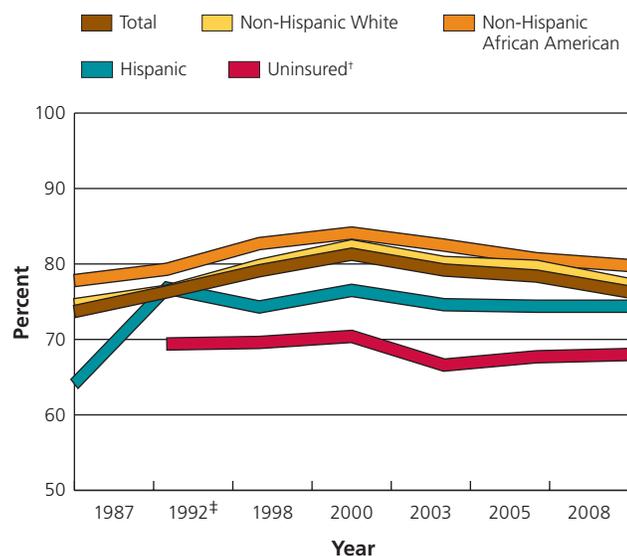
do include ACIP-recommended vaccines as a plan benefit, and most have agreed to cover the HPV vaccine. However, affordability concerns may be an issue among private health care providers because some have experienced financial barriers to purchasing the HPV vaccine.<sup>182</sup>

The HPV vaccine is available in all 50 states through the federal Vaccine for Children (VFC) program, which covers vaccine costs for children and teens who do not have insurance and for some children and teens who are underinsured or eligible for Medicaid.<sup>173</sup> The CDC has implemented the Pre-teen Vaccine Campaign to inform parents, caregivers, family physicians, and pediatricians about the new vaccination recommendations for 11- and 12-year-olds. Research shows that pre-teens generally do not get preventive health care, and visit the doctor only when they are sick. One goal of this campaign is to encourage parents to take their pre-teens in for the recommended 11- or 12-year-old checkup, which is endorsed by the American Academy for Pediatrics and the American Academy of Family Physicians, as well as the CDC.<sup>179</sup> Recent data from the National Immunization Survey of Teens showed that among US girls aged 13 to 17, the uptake of the HPV vaccine initiation (at least one of the three-dose HPV vaccination series) increased from 25.1% in 2007 to 44.3% in 2009. Nearly one-third (26.7%) of girls had the complete three-shot vaccine series in 2009.<sup>183</sup> Also, a recent CDC report showed steady improvements in the uptake of catch-up vaccine among previously unvaccinated women aged 13 to 26 years: in 2009, 17.1% had received at least one dose of HPV vaccination compared to 10.5% in 2008. Although comparable increases were seen across race and ethnic groups in this period, non-Hispanic white women had higher catch-up HPV vaccine uptake (19.8% versus), than black women (13.3%) or Hispanic women (12.6%).<sup>184</sup>

The HPV vaccines supplement rather than replace cervical cancer screening because they do not provide protection against all types of HPV that cause cervical cancer. Also, women may not receive the full benefits of the vaccine if they do not complete the vaccine series, or if they receive the vaccine after becoming infected with one or more types of HPV. Thus, women of all ages should continue to receive regular cervical cancer screening.<sup>181</sup>

The promise of cancer prevention vaccines from a broad public health perspective can be fully realized only if the vaccine reaches those subgroups of women for whom access to cervical cancer screening services is especially challenging, particularly immigrants, those living in rural areas, low-income and uninsured females, and others who have limited access to health care services.<sup>181</sup> Hence, the Society supports and advocates for the widespread availability and use of the vaccine consistent with published guidelines.<sup>185</sup> Legislators in at least 41 states and the District of Columbia have introduced legislation to require, fund, or educate the public about the HPV vaccine and to date, 19 states have enacted such legislation.<sup>186</sup>

**Figure 4B. Pap Test within the Past Three Years\*, Women 18 and Older, among Race/Ethnic Categories and the Uninsured†, US, 1987-2008**



\*Estimates for race and ethnic groups are age adjusted to the 2000 US standard population. †Estimates for the uninsured group are for women 18 to 64 years and are not age adjusted. ‡Estimate for the uninsured group is for the year 1993.

**Source:** 1987-2003: National Cancer Institute. Cancer Trends Progress Report – 2007 Update. Available at [progressreport.cancer.gov](http://progressreport.cancer.gov). Accessed September 10, 2009. Centers for Disease Control and Prevention, National Center for Health Statistics, Health, United States, 2008, With Special Feature on the Health of Young Adults. Hyattsville, Maryland: 2009. 2005, 2008: National Health Interview Survey Public Use Data File 2005, 2008, National Center for Health Statistics, Centers for Disease Control and Prevention, 2006, 2009.

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**Table 4C. Pap Test, Women 18 and Older, US, 2008**

| Characteristic                                | % Pap test within past 3 years* |
|---|---------------------------------|
| <b>Age (years)</b>                            |                                 |
| 18 to 20                                      | 57.6                            |
| 21 to 29                                      | 84.7                            |
| 30 to 39                                      | 85.9                            |
| 40 to 49                                      | 84.1                            |
| 50 to 59                                      | 84.5                            |
| 60 to 64                                      | 81.4                            |
| 65 to 85                                      | 56.3                            |
| <b>Race/ethnicity</b>                         |                                 |
| Hispanic/Latino                               | 75.0                            |
| White (non-Hispanic)                          | 79.6                            |
| African American (non-Hispanic)               | 81.5                            |
| American Indian/Alaska Native (non-Hispanic)† | 65.2                            |
| Asian American (non-Hispanic)‡                | 63.8                            |
| <b>Education§</b>                             |                                 |
| 11 or fewer                                   | 69.1                            |
| 12  | 73.9                            |
| 13-15   | 82.4                            |
| 16 or more                                    | 86.8                            |
| <b>Health insurance coverage</b>              |                                 |
| No  | 60.6                            |
| Yes   | 81.0                            |
| <b>Immigration¶</b>                           |                                 |
| Born in US                                    | 79.7                            |
| Born in US territory                          | 70.2                            |
| In US fewer than 10 yrs                       | 60.1                            |
| In US 10+ years                               | 74.3                            |
| <b>Total</b>                                  | <b>78.3</b>                     |

\*A Pap test within the past 3 years for all women 18 and over with intact uteri. Percentages are age adjusted to the 2000 US standard population. See Statistical Notes for more information. †Estimates should be interpreted with caution because of small sample size. ‡Does not include Native Hawaiians or other Pacific Islanders. §Women aged 25 and older. ¶Definition has changed such that individuals born in the US or in a US territory are reported separately from individuals born outside the US. Individuals born in a US territory have been in the US for any length of time.

**Source:** National Health Interview Survey Public Use Data File 2008, National Center for Health Statistics, Centers for Disease Control and Prevention, 2009.

American Cancer Society, Surveillance Research, 2011

## Pap Test Screening in the US

According to data from the 2008 NHIS, 78.3% of women aged 18 and older reported having a Pap test within the past three years, up from 74% in 1987.<sup>164</sup> Increases in Pap test use have occurred among women of all racial and ethnic groups (Figure 4B) except in uninsured women.

The prevalence of Pap test use varied by race and ethnicity: African American (81.5%) and white women (79.6%) were most likely to have had a recent test, and Asian women (63.8%) were least likely (Table 4C).

In 2008, the prevalence of recent Pap test use was lowest among older women (56.3%), women with no health insurance (60.6%), and recent immigrants (60.1%) (Table 4C).

## State-level Pap Test Screening

- Across the states surveyed by the BRFSS in 2008 (Table 4D, page 40), the recent Pap test percentage among women aged 18 and older with an intact uterus ranged from 73.3% in Utah to 89.9% in Delaware.

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

The CDC's National Breast and Cervical Cancer Early Detection Program (NBCCEDP) provides low-income, uninsured, and underserved women with access to timely, high-quality screening exams for the early detection of breast and cervical cancers and diagnostic services.<sup>187</sup> The program is currently implemented in all 50 states, the District of Columbia, five US territories, and 12 American Indian/Alaska Native organizations. About 50% of the women screened are from racial/ethnic minority groups. Since 1991, the NBCCEDP has served more than 3.7 million women, provided more than nine million screening examinations, and

**Table 4D. Pap Test, Women 18 and Older, by State, US, 2008**

|                            | % Recent Pap Test* |                |                    |  |                                  |
|----------------------------|--------------------|----------------|--------------------|--|----------------------------------|
|                            | 18 years and older | 18 to 64 years | 65 years and older | No usual source of medical care <sup>†</sup> | No health insurance <sup>‡</sup> |
| Alabama                    | 80.9               | 83.2           | 63.9               | 65.4   | 68.0                             |
| Alaska                     | 82.5               | 84.4           | 56.0               | 75.0   | 71.6                             |
| Arizona                    | 81.7               | 82.4           | 76.7               | 70.9   | 67.3                             |
| Arkansas                   | 80.4               | 83.6           | 59.7               | 72.3   | 73.7                             |
| California                 | 83.8               | 85.5           | 70.0               | 73.3   | 75.5                             |
| Colorado                   | 83.7               | 85.5           | 64.7               | 67.5   | 71.9                             |
| Connecticut                | 83.9               | 86.8           | 68.0               | 71.1   | 67.0                             |
| Delaware                   | 89.9               | 89.9           | §                  | 85.9   | 80.1                             |
| District of Columbia       | 88.8               | 91.2           | 72.9               | 80.0   | 79.2                             |
| Florida                    | 83.2               | 85.1           | 73.2               | 69.5   | 69.6                             |
| Georgia                    | 87.4               | 89.2           | 69.5               | 73.7   | 74.6                             |
| Hawaii                     | 82.6               | 84.6           | 72.0               | 61.9   | 60.3                             |
| Idaho                      | 76.4               | 78.1           | 59.9               | 60.2   | 64.1                             |
| Illinois                   | 83.2               | 86.4           | 61.2               | 67.1   | 70.8                             |
| Indiana                    | 78.9               | 81.6           | 61.9               | 64.0   | 63.7                             |
| Iowa                       | 83.6               | 86.6           | 67.5               | 71.9   | 73.4                             |
| Kansas                     | 83.5               | 86.1           | 65.8               | 68.4   | 68.4                             |
| Kentucky                   | 81.2               | 84.5           | 59.5               | 68.5   | 71.9                             |
| Louisiana                  | 76.4               | 78.4           | 61.2               | 60.5   | 67.3                             |
| Maine                      | 86.1               | 89.3           | 68.7               | 58.7   | 65.0                             |
| Maryland                   | 84.0               | 85.5           | 73.1               | 69.6   | 70.2                             |
| Massachusetts              | 87.5               | 90.2           | 71.8               | 73.8   | 74.0                             |
| Michigan                   | 84.5               | 86.5           | 70.8               | 64.6   | 72.8                             |
| Minnesota                  | 85.5               | 88.6           | 65.4               | 76.2   | 66.0                             |
| Mississippi                | 82.0               | 84.4           | 63.5               | 69.5   | 71.3                             |
| Missouri                   | 82.3               | 85.1           | 64.7               | 63.7   | 67.8                             |
| Montana                    | 80.8               | 82.8           | 67.7               | 72.5   | 69.3                             |
| Nebraska                   | 83.4               | 87.1           | 58.7               | 77.1   | 76.8                             |
| Nevada                     | 78.1               | 80.2           | 59.7               | 65.2   | 71.5                             |
| New Hampshire              | 85.8               | 89.2           | 64.4               | 67.9   | 76.3                             |
| New Jersey                 | 79.5               | 82.5           | 63.2               | 67.0   | 70.0                             |
| New Mexico                 | 80.9               | 83.2           | 63.5               | 70.5   | 73.9                             |
| New York                   | 83.0               | 85.1           | 71.4               | 68.2   | 73.1                             |
| North Carolina             | 86.5               | 88.3           | 73.0               | 79.1   | 79.8                             |
| North Dakota               | 82.3               | 84.6           | 69.4               | 70.6   | 81.5                             |
| Ohio                       | 82.4               | 84.9           | 65.8               | 60.7   | 61.9                             |
| Oklahoma                   | 81.0               | 83.0           | 66.0               | 65.2   | 70.1                             |
| Oregon                     | 81.4               | 83.7           | 64.9               | 71.6   | 71.2                             |
| Pennsylvania               | 81.7               | 85.1           | 63.5               | 61.3   | 64.7                             |
| Rhode Island               | 85.9               | 88.7           | 69.8               | 70.6   | 78.7                             |
| South Carolina             | 85.6               | 87.6           | 70.7               | 71.6   | 73.8                             |
| South Dakota               | 82.2               | 85.3           | 65.8               | 68.4   | 69.1                             |
| Tennessee                  | 83.8               | 85.7           | 70.4               | 64.6   | 65.1                             |
| Texas                      | 81.0               | 82.5           | 65.6               | 73.3   | 75.7                             |
| Utah                       | 73.3               | 74.7           | 57.8               | 61.4   | 64.6                             |
| Vermont                    | 85.7               | 88.4           | 69.4               | 64.6   | 74.9                             |
| Virginia                   | 83.0               | 84.6           | 70.6               | 71.9   | 68.6                             |
| Washington                 | 82.2               | 84.6           | 62.8               | 67.8   | 69.6                             |
| West Virginia              | 80.5               | 83.4           | 65.7               | 71.5   | 71.1                             |
| Wisconsin                  | 82.6               | 85.3           | 65.9               | 56.9   | 68.5                             |
| Wyoming                    | 77.5               | 80.1           | 58.3               | 67.4   | 70.5                             |
| United States <sup>¶</sup> | 82.8               | 85.0           | 67.6               | 69.9   | 71.7                             |
| Range                      | 73.3-89.9          | 74.7-91.2      | 56-76.7            | 56.9-85.9                                    | 60.3-81.5                        |

\*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. §Sample size is insufficient to provide a stable estimate or relevant questions not available in state survey. ¶See Statistical Notes for definition.

Source: Behavioral Risk Factor Surveillance System 2008, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2009. American Cancer Society, Surveillance Research, 2011

diagnosed more than 44,000 breast cancers, 123,500 precancerous cervical lesions, and 2,550 cases of invasive cervical cancer.<sup>187</sup>

In order to locate women eligible to receive services, state programs funded by NBCCEDP conduct outreach to priority populations (i.e., older women for breast cancer screening, women rarely or never screened for cervical cancer, and racial and ethnic minority women). Reaching priority populations can be difficult and costly and requires ongoing efforts with community partners and health care providers.<sup>187</sup> In the most recent period (2007-2009), the number of eligible women served by the NBCCEDP has been increasing (Figure 4C). Studies estimate that approximately 14% of NBCCEDP-eligible women aged 40-64 years are screened for breast cancer, and 8.7% of eligible women aged 18-64 years are screened for cervical cancer through the program.<sup>187</sup>

In recognition of the limited program resources, the CDC is assisting state programs in finding ways to enhance program efficiencies through economic evaluation studies.<sup>188</sup> The Society and ACS CAN continue to advocate for additional NBCCEDP funding from Congress and are also partnering with state health departments and other key organizations to implement best practices in communities that could strengthen the NBCCEDP.

The 2000 Breast and Cervical Cancer Prevention and Treatment Act has given states the option to provide medical assistance through Medicaid for follow up and treatment for women diagnosed with cancer through the NBCCEDP; all 50 states and the District of Columbia have elected to provide this coverage.<sup>187</sup> Currently, the Society and ACS CAN are working to ensure that state Medicaid dollars supporting the treatment program are

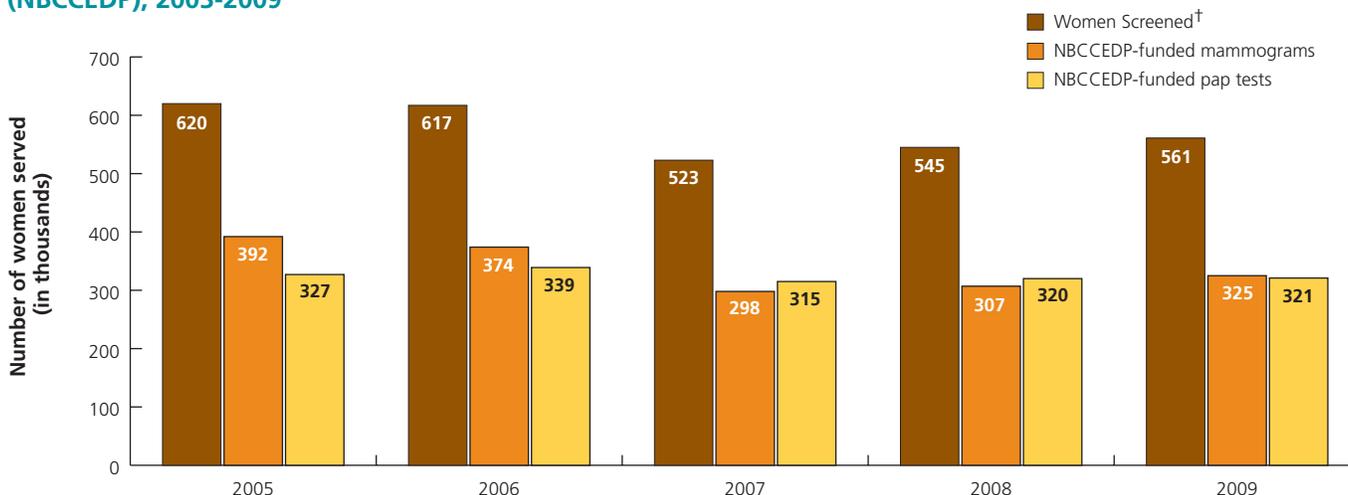
protected. In addition, ACS CAN is working hard to ensure that every woman has access to proven screening exams that can detect cancer early by ensuring prevention is part of health care reform.

## Colorectal Cancer Screening

Colorectal cancer (CRC) is the third leading cause of cancer death in the US in men and women. Promoting CRC screening is a major priority for the American Cancer Society because screening can reduce death rates from CRC both by preventing the disease and by detecting it at earlier, more treatable stages. The relative five-year survival is 90% for CRC patients diagnosed at an early, localized stage; however, only 39% of cases are diagnosed at this stage.<sup>1</sup> CRC can also be prevented through screening because precancerous polyps, from which these cancers usually develop, can be identified and removed.<sup>189,190</sup> Of the 49,380 people expected to die of CRCs in 2011, screening (or use of early detection tests) could save more than half.<sup>191</sup> In the past several years, there has been unprecedented progress in reducing CRC incidence and death rates; recent studies have shown that these declines can be attributed to improved CRC screening utilization, risk factor reduction (e.g., declining tobacco use), and improved treatments.<sup>192</sup>

The American Cancer Society and other organizations have developed and promoted CRC screening guidelines for more than two decades. In March 2008, the Society, the American College of Radiology, and the US Multisociety Task Force on Colorectal Cancer (a consortium representing the American

**Figure 4C. Number of Women Screened\* in the National Breast and Cervical Cancer Early Detection Program (NBCCEDP), 2003-2009\***



\*In program years, defined as July 1 through June 30. †Those who received NBCCEDP-funded Pap test, mammogram, or clinical breast exam.

Source: National Breast and Cervical Cancer Early Detection Program, Centers for Disease Control and Prevention, 2010.

American Cancer Society, Surveillance Research, 2011

**Table 4E. Colorectal Cancer Screening, Adults 50 and Older, US, 2008**

| Characteristic                                   | %<br>Fecal Occult<br>Blood Test**§ | %<br>Endoscopy†§ | % Combined<br>FOBT/<br>Endoscopy†§ |
|--|------------------------------------|------------------|------------------------------------|
| <b>Gender</b>                                    |                                    |                  |                                    |
| Male   | 10.3                               | 52.2             | 54.9                               |
| Female   | 9.7                                | 48.6             | 52.0                               |
| <b>Age (years)</b>                               |                                    |                  |                                    |
| 50-64  | 9.1                                | 45.7             | 49.1                               |
| 65+  | 11.1                               | 55.5             | 58.1                               |
| <b>Race/ethnicity</b>                            |                                    |                  |                                    |
| Hispanic/Latino                                  | 7.8                                | 34.6             | 37.2                               |
| White (non-Hispanic)                             | 10.3                               | 52.7             | 56.0                               |
| African American<br>(non-Hispanic)               | 8.9                                | 47.3             | 48.9                               |
| American Indian/Alaska<br>Native (non-Hispanic)¶ | 4.5                                | 31.7             | 33.1                               |
| Asian American<br>(non-Hispanic)#                | 12.1                               | 42.6             | 47.8                               |
| <b>Education (years)</b>                         |                                    |                  |                                    |
| 11 or fewer                                      | 8.1                                | 34.0             | 37.3                               |
| 12   | 8.1                                | 48.1             | 50.8                               |
| 13 to 15   | 12.9                               | 52.2             | 56.3                               |
| 16 or more                                       | 10.8                               | 61.9             | 64.5                               |
| <b>Health insurance coverage</b>                 |                                    |                  |                                    |
| No   | 8.8                                | 12.7             | 19.5                               |
| Yes  | 10.3                               | 52.6             | 55.7                               |
| <b>Immigration**</b>                             |                                    |                  |                                    |
| Born in US                                       | 10.1                               | 51.9             | 55.0                               |
| Born in US Territory                             | 5.8                                | 42.3             | 45.9                               |
| In US fewer than 10 years                        | 8.0                                | 22.5             | 28.0                               |
| In US 10 years or more                           | 9.7                                | 38.7             | 41.9                               |
| <b>Total</b>                                     | <b>10.0</b>                        | <b>50.2</b>      | <b>53.2</b>                        |

\*A home fecal occult blood test within the past year. †A sigmoidoscopy within the past five years or a colonoscopy within the past 10 years. ‡Either a fecal occult blood test within the past year, sigmoidoscopy within the past five years, or a colonoscopy within the past 10 years. §Percentages are age adjusted to the 2000 US standard population. See Statistical Notes for more information. ¶Estimates should be interpreted with caution because of the small sample sizes. #Does not include Native Hawaiians or other Pacific Islanders. \*\*Definition has changed such that individuals born in the US or in a US territory are reported separately from individuals born outside the US. Individuals born in a US territory have been in the US for any length of time.

**Source:** National Health Interview Survey Public Use Data File, 2008, National Center for Health Statistics, Centers for Disease Control and Prevention, 2009.

American Cancer Society, Surveillance Research, 2011

number of quality factors required to attain optimal benefits from screening. There are several recommended methods for colorectal cancer screening. (For American Cancer Society screening guidelines, see sidebar, page 34.) Methods in the cancer detection group consist of stool home-test kits – the guaiac-based fecal occult blood test (gFOBT), the fecal immunochemical test (FIT), and the stool DNA test. The methods for structural examinations include flexible sigmoidoscopy, colonoscopy, CT colonography, and double-contrast barium enema. These tests not only find cancer, but also are more likely to result in the detection and removal of adenomatous polyps/lesions, which are associated with an increased risk of CRC.<sup>189</sup>

## Colorectal Cancer Screening in the US

Although utilization is improving, CRC screening prevalence continues to lag behind use of mammography and Pap testing.

According to the 2008 NHIS:

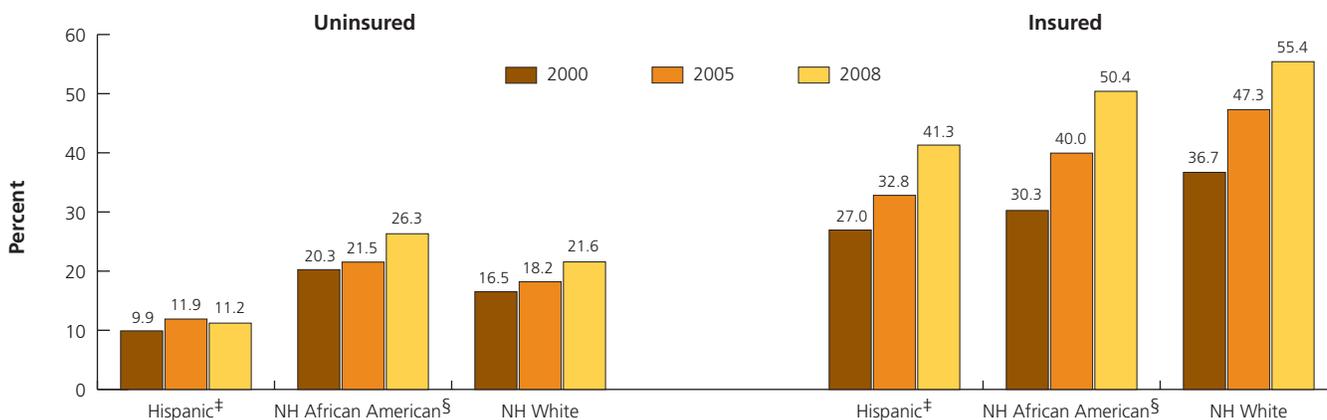
- Among adults aged 50 and older, the use of any CRC test within recommended time intervals (either an FOBT within the past year or a sigmoidoscopy within the past five years or a colonoscopy within the past 10 years) increased between 2000 (38%) and 2008 (53.2%). The increase appears to be due to an increase in use of endoscopy, which increased from 34% in 2000 to 50% in 2008, compared to use of FOBT, which declined from 17% in 2000 to 10% in 2008.<sup>193</sup> However, FOBT remains an important screening option (Table 4E).
- People with no health insurance coverage have significant access barriers and are less likely to be up to date with CRC screening compared to their insured counterparts. Between 2000 and 2008, there were significant increases in the use of CRC screening within recommended time intervals across race and ethnic groups of insured adults (aged 50 to 64). The largest increases in CRC screening utilization occurred among insured non-Hispanic whites (Figure 4D).
- In 2008, the prevalence of CRC screening varies by race and ethnicity, education, health insurance coverage, and immigration status. The least likely to have had a CRC screening test were Hispanics, those with less than a high school education, those without health insurance, and immigrants who had been in the US for fewer than 10 years (Table 4E).

## State-level Colorectal Cancer Screening

- Across the states surveyed in 2008, the recent FOBT percentages for adults aged 50 and older ranged from 4.9% in Utah to 21.0% in Florida and 20.1% in California (Table 4F, page 44). CRC screening with endoscopy tests (either a sigmoidoscopy or colonoscopy within the past 10 years) ranged from 50.1% in Louisiana to 72.1% in Delaware (Table 4F, page 44).

College of Gastroenterology, the American Society of Gastrointestinal Endoscopy, and the American Gastroenterological Association) released updated CRC guidelines. These guidelines categorize screening methods into two distinct groups: tests that primarily detect cancer and tests that detect both cancer and precancerous adenomatous polyps (and thus have a greater potential to contribute to cancer prevention). The guidelines also highlight the potential of some newer screening methods, as well as the importance of quality in CRC screening by delineating a

**Figure 4D. Colorectal Cancer Screening\*, Adults 50 to 64 Years, by Race and Ethnicity and Insurance Status†, US, 2000, 2005, and 2008**



NH: non-Hispanic. \*Either a fecal occult blood test within the past year, or sigmoidoscopy within the past 5 years, or colonoscopy within the past 10 years. Estimates are age adjusted to the 2000 US standard population. †The uninsured are those who did not report having health insurance at the time of the interview. Uninsured: ‡NH whites are significantly more likely to have been tested than Hispanics (2000, 2005, and 2008); §NH African Americans are significantly more likely to have been tested than Hispanics (2008). Insured: ‡NH whites are significantly more likely to have been tested than Hispanics (2000, 2005, and 2008) and NH African Americans (2000 and 2005); §NH African Americans are significantly more likely to have been tested than Hispanics (2008).

**Source:** National Health Interview Survey Public Use Data File 2000, 2005, and 2008 National Center for Health Statistics, Centers for Disease Control and Prevention, 1999, 2006, 2009.

American Cancer Society, Surveillance Research, 2011

The recent increases in CRC screening may be attributed to multiple efforts to increase awareness of the importance of screening, expansions in coverage for colonoscopy screening by Medicare since 2001, changes in private health plans screening policies as a result of state legislation, increasing provider recommendations for screening and the establishment of screening programs in certain states.<sup>193-195</sup> However, broader community efforts need to be intensified to increase availability and utilization of CRC screening, especially for persons with lower socioeconomic status who are more likely to lack health care coverage and to experience greater difficulties in accessing health care.<sup>193,194</sup>

### How the Society Promotes Screening for Colorectal Cancer

As part of the goal to lower cancer incidence and mortality among minority and other medically underserved populations, the Society and ACS CAN are working with Congress to help pass federal legislation that will authorize a national program at the CDC to provide CRC screening, treatment, and outreach to medically underserved communities.

The CDC recently announced grant awards (totaling \$22 million) to 26 states and tribal organizations. The program aims to increase population-level CRC screening among all persons aged 50 and older in the participating states and tribes and to reduce health disparities in CRC screening, incidence, and mortality by providing colorectal cancer screening services for low-income people aged 50 to 64 who are underinsured or uninsured. This new

program effort builds on the previous CDC Colorectal Cancer Screening Demonstration Program, funded from 2005-2009; for more information, see [cdc.gov/colorectal](http://cdc.gov/colorectal) and [cdc.gov/screenforlife](http://cdc.gov/screenforlife).

Broadening insurance coverage for the full range of CRC screening tests is a high priority for the American Cancer Society. The Society has advocated at both state and federal levels for health care reform to ensure that private and public health insurance plans cover the full range of recommended screening methods. To date, these efforts have succeeded in 26 states and the District of Columbia (Figure 4E, page 45).

The Society is also collaborating with the Centers for Medicare & Medicaid Services (CMS) to help that organization increase CRC screening use among the 44 million Medicare beneficiaries. CMS has leveraged resources across the agency to promote a wide range of interventions, including communicating with beneficiaries who are due for screening, informing physicians about Medicare CRC screening coverage, and including CRC screening measures in Medicare quality improvement initiatives.

The Society and ACS CAN also succeeded in advocacy efforts to allow Medicare beneficiaries a full year to schedule a Welcome to Medicare visit. This time expansion, which was put into effect on January 1, 2009, allows beneficiaries more time to act on this benefit and gives doctors enough time to fit an in-depth visit into their schedules. ACS CAN has also worked to ensure that cancer screening is not subject to annual deductibles.

**Table 4F. Colorectal Cancer Screening, Adults 50 and Older, by State, US, 2008**

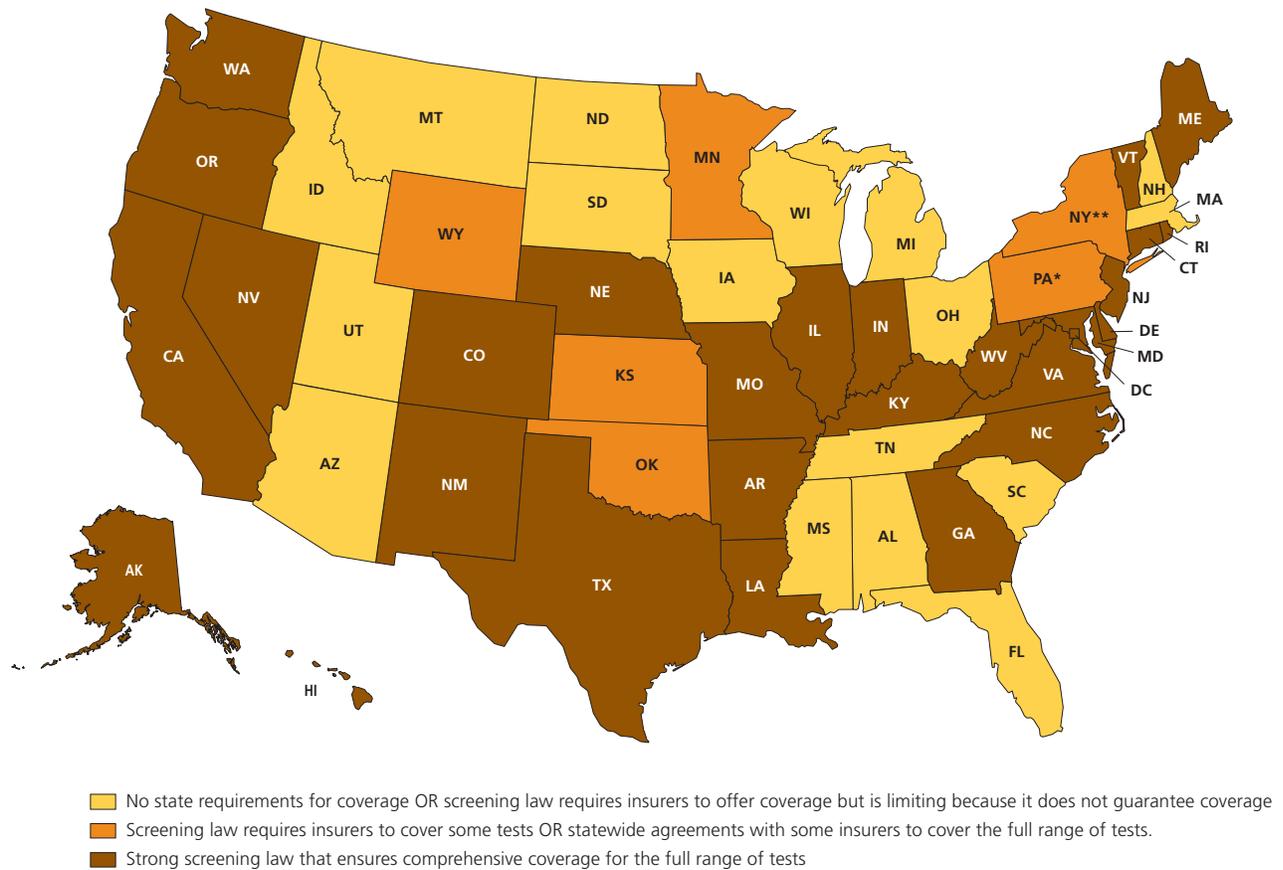
|                      | % Fecal Occult Blood Test* |                |                    |                                  |                      | % Endoscopy†       |                |                    |                                  |                      | Combined FOBT/ Endoscopy past 10 years¶ |
|----------------------|----------------------------|----------------|--------------------|----------------------------------|----------------------|--------------------|----------------|--------------------|----------------------------------|----------------------|---|
|                      | 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              | 13.4                       | 10.8           | 17.2               | 10.1                             | 8.0                  | 57.4               | 51.0           | 66.6               | 29.7                             | 22.3                 | 59.7                                    |
| Alaska               | 9.1                        | 8.3            | 11.2               | 2.6                              | 3.0                  | 54.1               | 50.0           | 64.7               | 29.9                             | 28.8                 | 55.5                                    |
| Arizona              | 16.3                       | 12.8           | 20.9               | 10.1                             | 6.3                  | 59.2               | 50.7           | 69.9               | 32.7                             | 23.0                 | 63.2                                    |
| Arkansas             | 12.9                       | 9.7            | 17.2               | 6.4                              | 5.4                  | 51.5               | 45.2           | 59.8               | 27.1                             | 22.5                 | 55.1                                    |
| California           | 20.1                       | 17.4           | 24.3               | 7.8                              | 4.9                  | 56.6               | 48.8           | 68.8               | 19.4                             | 11.3                 | 62.1                                    |
| Colorado             | 14.4                       | 11.9           | 19.0               | 4.1                              | 4.9                  | 58.4               | 52.7           | 68.8               | 23.1                             | 27.5                 | 62.7                                    |
| Connecticut          | 15.7                       | 13.4           | 18.9               | 2.9                              | 5.8                  | 67.0               | 63.4           | 72.1               | 37.2                             | 49.4                 | 69.4                                    |
| Delaware             | 13.2                       | 10.8           | 16.4               | 7.5                              | 6.8                  | 72.1               | 69.0           | 76.4               | 41.3                             | 54.7                 | 73.9                                    |
| District of Columbia | 18.3                       | 16.9           | 20.3               | 5.8                              | 13.7                 | 66.0               | 61.4           | 72.6               | 36.8                             | 34.0                 | 68.3                                    |
| Florida              | 21.0                       | 17.6           | 24.9               | 9.0                              | 11.2                 | 61.7               | 54.1           | 70.4               | 32.0                             | 26.0                 | 66.0                                    |
| Georgia              | 16.5                       | 15.2           | 18.9               | 11.9                             | 10.3                 | 59.8               | 53.7           | 70.4               | 34.1                             | 32.0                 | 64.3                                    |
| Hawaii               | 18.5                       | 16.3           | 21.5               | 9.6                              | 6.3                  | 56.8               | 50.3           | 65.4               | 33.1                             | 27.9                 | 62.3                                    |
| Idaho                | 11.6                       | 9.8            | 14.3               | 2.8                              | 5.3                  | 52.1               | 44.5           | 64.0               | 25.0                             | 19.7                 | 55.4                                    |
| Illinois             | 10.9                       | 9.5            | 12.9               | 5.4                              | 7.4                  | 56.1               | 50.1           | 64.7               | 26.7                             | 34.3                 | 59.1                                    |
| Indiana              | 12.3                       | 9.4            | 16.5               | 4.4                              | 4.9                  | 56.2               | 50.1           | 65.2               | 28.8                             | 22.2                 | 58.7                                    |
| Iowa                 | 14.8                       | 12.7           | 17.4               | 4.9                              | 10.7                 | 60.3               | 55.1           | 66.8               | 38.7                             | 27.7                 | 63.9                                    |
| Kansas               | 14.9                       | 12.1           | 18.9               | 7.5                              | 4.4                  | 58.6               | 53.1           | 66.3               | 25.4                             | 29.1                 | 62.3                                    |
| Kentucky             | 11.0                       | 9.5            | 13.2               | 6.2                              | 14.4                 | 60.2               | 56.4           | 65.8               | 27.5                             | 35.9                 | 63.2                                    |
| Louisiana            | 16.9                       | 15.0           | 19.7               | 10.6                             | 12.1                 | 50.1               | 46.1           | 56.1               | 28.0                             | 27.5                 | 55.4                                    |
| Maine                | 18.1                       | 14.3           | 23.7               | 6.0                              | 9.6                  | 70.1               | 66.6           | 75.2               | 39.9                             | 41.1                 | 74.0                                    |
| Maryland             | 14.6                       | 12.1           | 18.7               | 8.6                              | 4.2                  | 68.7               | 64.7           | 75.2               | 40.9                             | 37.8                 | 71.0                                    |
| Massachusetts        | 17.0                       | 13.6           | 21.7               | 7.7                              | 9.4                  | 69.3               | 67.9           | 71.2               | 36.1                             | 39.8                 | 72.1                                    |
| Michigan             | 14.6                       | 12.8           | 17.3               | 4.3                              | 8.0                  | 64.1               | 59.4           | 71.3               | 22.0                             | 35.5                 | 66.3                                    |
| Minnesota            | 8.0                        | 5.3            | 12.1               | 2.7                              | 2.9                  | 67.9               | 62.8           | 75.6               | 31.9                             | 28.2                 | 69.1                                    |
| Mississippi          | 14.5                       | 13.0           | 16.6               | 11.2                             | 6.2                  | 52.8               | 46.4           | 62.2               | 27.1                             | 16.8                 | 56.1                                    |
| Missouri             | 10.6                       | 8.5            | 13.6               | 5.7                              | 6.5                  | 58.0               | 53.1           | 65.1               | 21.5                             | 27.5                 | 60.8                                    |
| Montana              | 13.9                       | 12.7           | 15.6               | 6.1                              | 8.0                  | 53.1               | 44.9           | 65.5               | 28.7                             | 18.6                 | 57.6                                    |
| Nebraska             | 12.6                       | 10.0           | 16.1               | 6.0                              | 9.1                  | 55.6               | 51.3           | 61.4               | 31.7                             | 26.2                 | 59.2                                    |
| Nevada               | 12.3                       | 9.2            | 17.3               | 6.4                              | 1.9                  | 51.3               | 44.4           | 62.3               | 19.5                             | 16.3                 | 54.7                                    |
| New Hampshire        | 15.9                       | 12.5           | 21.4               | 4.7                              | 8.2                  | 69.4               | 65.0           | 76.5               | 33.2                             | 37.6                 | 72.2                                    |
| New Jersey           | 14.5                       | 13.3           | 16.4               | 7.3                              | 6.4                  | 56.5               | 52.7           | 62.0               | 28.1                             | 26.3                 | 60.7                                    |
| New Mexico           | 12.1                       | 10.2           | 14.9               | 7.1                              | 7.7                  | 52.8               | 45.4           | 63.6               | 25.4                             | 14.8                 | 57.2                                    |
| New York             | 12.4                       | 10.3           | 15.4               | 5.4                              | 6.6                  | 63.6               | 58.3           | 71.1               | 28.6                             | 33.5                 | 66.2                                    |
| North Carolina       | 16.8                       | 14.3           | 20.6               | 7.7                              | 6.8                  | 64.1               | 59.0           | 71.7               | 33.1                             | 28.6                 | 66.9                                    |
| North Dakota         | 13.5                       | 11.4           | 16.1               | 5.3                              | 9.6                  | 54.9               | 46.1           | 65.9               | 31.8                             | 28.9                 | 58.9                                    |
| Ohio                 | 13.3                       | 11.2           | 16.4               | 5.2                              | 9.2                  | 57.3               | 52.0           | 65.1               | 21.6                             | 26.6                 | 60.8                                    |
| Oklahoma             | 11.4                       | 9.8            | 13.4               | 3.9                              | 7.6                  | 51.5               | 44.5           | 60.7               | 20.8                             | 20.4                 | 54.9                                    |
| Oregon               | 14.8                       | 11.7           | 19.5               | 5.1                              | 5.9                  | 62.8               | 57.1           | 71.5               | 22.9                             | 27.6                 | 65.5                                    |
| Pennsylvania         | 12.2                       | 10.0           | 14.9               | 11.9                             | 10.9                 | 59.4               | 54.5           | 65.7               | 24.9                             | 32.0                 | 62.8                                    |
| Rhode Island         | 14.0                       | 11.4           | 17.7               | 2.4                              | 8.6                  | 67.2               | 62.6           | 73.8               | 30.4                             | 39.2                 | 70.2                                    |
| South Carolina       | 13.0                       | 11.2           | 15.6               | 5.6                              | 8.4                  | 62.3               | 58.3           | 68.1               | 24.2                             | 34.1                 | 65.2                                    |
| South Dakota         | 13.8                       | 11.9           | 16.2               | 8.4                              | 5.6                  | 59.3               | 51.2           | 69.6               | 27.9                             | 32.4                 | 62.5                                    |
| Tennessee            | 14.4                       | 13.8           | 15.3               | 8.1                              | 5.3                  | 57.2               | 51.5           | 66.0               | 33.8                             | 32.2                 | 60.9                                    |
| Texas                | 13.3                       | 11.2           | 16.8               | 4.6                              | 5.7                  | 53.5               | 46.8           | 64.4               | 25.3                             | 22.8                 | 56.4                                    |
| Utah                 | 4.9                        | 4.5            | 5.6                | 5.1                              | 5.4                  | 63.9               | 58.2           | 73.0               | 33.4                             | 30.8                 | 64.8                                    |
| Vermont              | 13.1                       | 9.8            | 18.4               | 2.9                              | 9.4                  | 66.7               | 63.4           | 72.2               | 30.5                             | 35.0                 | 69.7                                    |
| Virginia             | 14.2                       | 13.0           | 16.1               | 7.0                              | 13.8                 | 67.4               | 63.3           | 74.0               | 44.3                             | 35.1                 | 70.1                                    |
| Washington           | 16.0                       | 13.1           | 21.0               | 6.2                              | 6.4                  | 62.9               | 56.9           | 72.7               | 32.4                             | 29.9                 | 66.1                                    |
| West Virginia        | 15.6                       | 13.2           | 18.8               | 8.6                              | 8.5                  | 51.3               | 46.8           | 57.2               | 21.6                             | 18.5                 | 56.3                                    |
| Wisconsin            | 10.1                       | 6.8            | 15.0               | 2.0                              | 4.9                  | 64.7               | 57.8           | 74.9               | 26.4                             | 29.1                 | 66.6                                    |
| Wyoming              | 11.4                       | 10.1           | 13.5               | 7.2                              | 6.1                  | 52.3               | 45.1           | 64.3               | 27.4                             | 27.4                 | 56.5                                    |
| United States#       | 14.8                       | 12.5           | 18.1               | 6.8                              | 7.4                  | 59.6               | 53.8           | 68.1               | 27.6                             | 26.2                 | 63.1                                    |
| Range                | 4.9-21                     | 4.5-17.6       | 5.6-24.9           | 2-11.9                           | 1.9-14.4             | 50.1-72.1          | 44.4-69        | 56.1-76.5          | 19.4-44.3                        | 11.3-54.7            | 54.7-74                                 |

\*A fecal occult blood test within the past year. †A sigmoidoscopy or colonoscopy within the preceding 10 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. ¶A fecal occult blood test within the past year or a sigmoidoscopy or colonoscopy within the preceding 10 years. Note: The colorectal cancer screening prevalence estimates do not distinguish between examinations for screening or diagnosis. #See Statistical Notes for definition.

**Source:** Behavioral Risk Factor Surveillance System Public Use Data Tape 2008, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2009.

American Cancer Society, Surveillance Research, 2011

**Figure 4E. Colon and Rectum Cancer Screening Coverage Legislation, by State, US, 2011**



**Source:** Health Policy Tracking Service & Individual State Bill Tracking Services. Provided by American Cancer Society Cancer Action Network.  
 \*Pennsylvania passed its law in 2008, but restricted the mandate to employers with more than 50 employees. \*\*The New York Health Plan Association, which serves 6 million New Yorkers, covers the full range of colorectal cancer screening tests as a part of a voluntary collaborative with the American Cancer Society.

**Initiatives**

The National Colorectal Cancer Roundtable (NCCRT), co-founded by the Society and the CDC, is a national coalition of public, private, and voluntary organizations, and invited experts dedicated to reducing the incidence of and mortality of CRC in the US through coordinated leadership, strategic planning, and advocacy. The roundtable taps into the expertise of its member organizations to create tools, conduct studies, develop consensus on outreach, and support projects that can advance the community’s overall work in this area. Recognizing the ongoing need to educate and assist providers in adopting CRC screening guidelines consistently<sup>196</sup>, the NCCRT continues to be involved in communication efforts with health care providers to remind them about their crucial role in getting patients screened for colorectal cancer. In addition, the NCCRT developed a colorectal cancer Clinician’s Evidence-based Toolbox and Guide to further assist providers. (More information on health professional resources is available at [cancer.org/colonmd](http://cancer.org/colonmd).)

The American Cancer Society has developed an educational video and an information resource kit explaining the various colorectal cancer screening options to help consumers talk with their physicians and decide what is best for them. (More information on these and other programs can be found in the *Colorectal Cancer Facts & Figures, 2011-2013*, which is available at [cancer.org/statistics](http://cancer.org/statistics).)

**Prostate Cancer Screening**

Among US men, cancer of the prostate is the most common type of cancer (other than skin cancer) and the second leading cause of cancer death. Mortality trends for prostate cancer have been declining, and according to some experts, this may suggest that early detection using the prostate-specific antigen test (PSA, a blood test to assess the levels of a protein made by the prostate) or digital rectal exam (DRE) may be beneficial. However, the results of three large clinical trials designed to determine the efficacy of PSA testing were not in agreement. Two European studies found

a lower risk of death from prostate cancer among men receiving PSA screening while a US study did not.<sup>197-199</sup> Further analyses of these studies are under way. Most experts agree that the current evidence is insufficient to recommend for or against routine testing for early prostate cancer detection.<sup>154</sup> The American Cancer Society recommends that asymptomatic men who have at least a 10-year life expectancy have an opportunity to make an informed decision with their health care provider about whether to be screened for prostate cancer after receiving information about the uncertainties, risks, and potential benefits associated with PSA screening.<sup>154</sup> Men at average risk should receive this information beginning at age 50; men at higher risk should receive this information at age 40 or 45 years, depending on their particular risk profile.<sup>154</sup> Asymptomatic men who have less than a 10-year life expectancy based on age and health status

should not be offered prostate cancer screening. Prostate cancer screening should not occur without an informed decision-making process. Studies have shown that informed and shared decision-making measures are inconsistently utilized in clinical practice, and that when such discussions take place the content varies widely and frequently falls short of accepted standards.<sup>200</sup> In an effort to address these shortcomings, the 2010 American Cancer Society guideline for the first time provided detailed recommendations to clinicians on the core factors related to prostate cancer screening and treatment that should be shared with men to enable them to make a truly informed decision about whether to be screened. The guideline also includes updated recommendations for the testing and follow up of men who choose to be screened for prostate cancer after a process of shared or informed decision making.<sup>154</sup>

**Table 4G. Prostate Cancer Test Use, Men 50 and Older, US, 2008**

|   | % PSA in the past year*† |
|---|--------------------------|
| <b>Age (years)</b>                            |                          |
| 50-64   | 36.5                     |
| 65+   | 53.0                     |
| <b>Race/ethnicity</b>                         |                          |
| Hispanic/Latino                               | 32.7                     |
| White (non-Hispanic)                          | 46.6                     |
| African American (non-Hispanic)               | 38.6                     |
| American Indian/Alaska Native (non-Hispanic)‡ | 9.7                      |
| Asian American (non-Hispanic)§                | 34.7                     |
| <b>Education (years)</b>                      |                          |
| 11 or fewer                                   | 29.8                     |
| 12  | 37.6                     |
| 13 to 15                                      | 48.1                     |
| 16 or more                                    | 55.7                     |
| <b>Health insurance coverage</b>              |                          |
| No  | 9.1                      |
| Yes   | 46.2                     |
| <b>Immigration¶</b>                           |                          |
| Born in US                                    | 45.2                     |
| Born in US territory                          | 42.6                     |
| In US fewer than 10 years                     | 18.5                     |
| In US 10+ years                               | 36.8                     |
| <b>Total</b>                                  | <b>44.1</b>              |

\*A prostate-specific antigen test within the past year for men 50 and older who did not report that they had ever been diagnosed with prostate cancer. Note: The 2005 estimate for PSA screening is not comparable to estimates from 2003 and prior years. Since 2005, questions assessing PSA screening were asked among all men 40 or older, whereas prior to 2005 these questions were asked only of men 40 or older who reported ever having heard of a PSA test. †Percentages are age adjusted to 2000 US standard population. See Statistical Notes for more information. ‡Estimates should be interpreted with caution because of the small samples sizes. §Does not include Native Hawaiians and other Pacific Islanders. ¶Definition has changed such that individuals born in the US or in a US territory are reported separately from individuals born outside the US.

**Source:** National Health Interview Survey Public Use Data File 2008, National Center for Health Statistics, Centers for Disease Control and Prevention, 2009. American Cancer Society, Surveillance Research, 2011

## Prostate Cancer Testing in the US

According to the 2008 NHIS:

- The prevalence of having a PSA test in men aged 50 and older within the past year was 44.1% (Table 4G).
- Among men aged 50 and older, the least likely to have a PSA test were those who had no health insurance, American Indian and Alaska Native men, and recent immigrants (Table 4G).

## State-level Prostate Cancer Testing

- Across states (Table 4H), the prevalence of PSA testing in 2008 for men aged 50 and older ranged from 46.4% in Alaska to 65.2% in Florida. The DRE percentages in 2008 for men aged 50 and older ranged from 35.2% in Nevada to 68.3% in Rhode Island. For both of these tests, use was greater among men 65 and older than in those aged 50 to 64. Across all states, men aged 50 years and older who lacked a usual source of health care and uninsured men aged 50 to 64 years were significantly less likely to have had a recent PSA or a DRE.

## Lung Cancer Screening

Among US men and women, lung cancer is the leading cause of cancer mortality, accounting for 27% of all cancer deaths in 2011. In men, lung cancer incidence and mortality rates have been declining over the past two decades; in women, incidence rates have plateaued and mortality rates are declining after a long period of increase. The difference in these trends reflects historical patterns in uptake of smoking and cessation. Until recently, screening to detect early lung cancer had not been shown to reduce mortality. Early studies evaluating the efficacy of chest x-ray, analysis of cells in sputum, and fiberoptic examination of the bronchial passages did not provide convincing evidence that early lung cancer detection was associated with a reduced risk of lung cancer death. However, the application of low-dose spiral computed tomography (LDCT) scans significantly outperformed chest x-ray in both sensitivity and the rate of detection of small, early stage lung cancers. Based on these results, prospective

**Table 4H. Prostate Cancer Test Use, Men 50 and Older, by State, US, 2008**

|                      | % 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              | 62.5                                     | 59.8           | 67.5               | 34.5                             | 39.6                 | 45.8                          | 43.6           | 49.8               | 28.6                             | 40.9                 |
| Alaska               | 46.4                                     | 41.8           | 62.4               | 28.2                             | 13.9                 | 42.9                          | 39.5           | 54.8               | 22.9                             | 9.9                  |
| Arizona              | 61.4                                     | 52.0           | 75.6               | 36.2                             | 25.3                 | 55.4                          | 50.8           | 62.6               | 31.9                             | 27.0                 |
| Arkansas             | 57.1                                     | 51.1           | 67.1               | 26.9                             | 28.7                 | 47.8                          | 43.4           | 55.1               | 17.6                             | 24.3                 |
| California           | 51.4                                     | 46.4           | 61.0               | 19.6                             | 12.4                 | 47.5                          | 42.7           | 56.6               | 20.4                             | 9.5                  |
| Colorado             | 53.7                                     | 48.2           | 66.7               | 26.1                             | 18.8                 | 47.7                          | 43.1           | 58.9               | 19.5                             | 13.8                 |
| Connecticut          | 58.4                                     | 53.4           | 67.8               | 27.4                             | 36.3                 | 58.6                          | 56.8           | 61.9               | 15.4                             | 30.6                 |
| Delaware             | 63.3                                     | 58.4           | 71.9               | ¶                                | ¶                    | 53.9                          | 52.4           | 56.6               | ¶                                | ¶                    |
| District of Columbia | 59.7                                     | 53.6           | 70.9               | 31.8                             | ¶                    | 57.4                          | 52.6           | 66.4               | 24.3                             | ¶                    |
| Florida              | 65.2                                     | 55.2           | 78.8               | 28.1                             | 33.1                 | 53.4                          | 46.8           | 62.6               | 20.4                             | 27.0                 |
| Georgia              | 58.9                                     | 53.6           | 71.5               | 26.9                             | 28.3                 | 48.0                          | 44.6           | 55.8               | 21.5                             | 16.0                 |
| Hawaii               | 46.5                                     | 38.7           | 59.2               | 16.4                             | 13.4                 | 38.3                          | 34.5           | 44.5               | 15.9                             | 11.1                 |
| Idaho                | 51.0                                     | 45.0           | 62.7               | 24.9                             | 21.3                 | 44.0                          | 39.7           | 52.3               | 22.1                             | 19.2                 |
| Illinois             | 53.9                                     | 50.8           | 59.8               | 20.7                             | ¶                    | 46.5                          | 44.3           | 50.6               | 10.3                             | 23.6                 |
| Indiana              | 55.6                                     | 47.8           | 71.2               | 19.7                             | 19.8                 | 48.2                          | 44.8           | 54.8               | 19.6                             | 21.5                 |
| Iowa                 | 53.3                                     | 46.0           | 65.1               | 23.1                             | ¶                    | 48.4                          | 45.8           | 52.7               | 24.4                             | 29.9                 |
| Kansas               | 57.3                                     | 50.5           | 70.6               | 25.5                             | 26.8                 | 46.8                          | 42.7           | 55.0               | 15.4                             | 16.8                 |
| Kentucky             | 54.0                                     | 47.4           | 66.5               | 16.4                             | 23.5                 | 44.5                          | 43.1           | 47.3               | 18.4                             | 19.0                 |
| Louisiana            | 51.4                                     | 48.5           | 56.8               | 23.6                             | 29.0                 | 38.3                          | 34.3           | 46.3               | 16.5                             | 14.7                 |
| Maine                | 59.1                                     | 54.9           | 66.8               | 24.1                             | 36.1                 | 60.3                          | 58.2           | 64.3               | 24.7                             | 40.8                 |
| Maryland             | 56.9                                     | 51.0           | 68.4               | 33.3                             | 42.6                 | 53.7                          | 49.5           | 62.1               | 27.1                             | 41.7                 |
| Massachusetts        | 60.6                                     | 56.2           | 68.9               | 24.0                             | 47.2                 | 62.4                          | 59.9           | 67.2               | 26.5                             | 42.4                 |
| Michigan             | 59.0                                     | 54.7           | 67.6               | 12.2                             | 28.7                 | 52.6                          | 49.6           | 58.6               | 16.6                             | 30.4                 |
| Minnesota            | 48.9                                     | 43.2           | 60.0               | 20.9                             | ¶                    | 47.1                          | 44.9           | 51.5               | 24.1                             | ¶                    |
| Mississippi          | 56.1                                     | 51.2           | 65.5               | 28.3                             | 20.0                 | 45.3                          | 41.7           | 52.3               | 21.7                             | 22.0                 |
| Missouri             | 53.4                                     | 45.5           | 67.8               | 21.6                             | 28.9                 | 42.8                          | 37.1           | 52.9               | 16.4                             | 20.6                 |
| Montana              | 55.0                                     | 50.8           | 63.0               | 32.0                             | 25.4                 | 48.1                          | 43.8           | 56.3               | 22.6                             | 27.3                 |
| Nebraska             | 53.4                                     | 49.4           | 60.6               | 31.4                             | 32.7                 | 43.2                          | 40.7           | 47.7               | 23.6                             | 24.1                 |
| Nevada               | 53.2                                     | 47.1           | 65.4               | 24.6                             | 25.7                 | 35.2                          | 29.3           | 47.3               | 14.4                             | 14.8                 |
| New Hampshire        | 58.4                                     | 53.5           | 68.8               | 12.6                             | 19.8                 | 63.6                          | 61.1           | 68.8               | 15.7                             | 30.7                 |
| New Jersey           | 56.2                                     | 53.1           | 62.3               | 25.6                             | 27.0                 | 47.2                          | 44.7           | 52.0               | 23.8                             | 23.1                 |
| New Mexico           | 49.7                                     | 41.9           | 63.1               | 21.7                             | 20.8                 | 43.2                          | 38.2           | 52.0               | 17.6                             | 14.8                 |
| New York             | 57.3                                     | 51.3           | 69.0               | 23.9                             | 30.1                 | 51.6                          | 48.3           | 58.2               | 21.4                             | 32.4                 |
| North Carolina       | 59.9                                     | 54.5           | 70.1               | 20.2                             | 22.2                 | 56.6                          | 53.1           | 63.3               | 22.0                             | 25.6                 |
| North Dakota         | 56.2                                     | 49.1           | 68.5               | 28.3                             | 33.4                 | 49.7                          | 44.3           | 59.3               | 19.7                             | 24.6                 |
| Ohio                 | 54.5                                     | 48.6           | 65.4               | 17.9                             | 28.4                 | 48.3                          | 44.7           | 55.1               | 15.6                             | 23.8                 |
| Oklahoma             | 51.6                                     | 43.1           | 65.7               | 20.0                             | 24.0                 | 40.2                          | 32.6           | 52.9               | 12.1                             | 17.7                 |
| Oregon               | 52.2                                     | 46.5           | 62.9               | 10.5                             | 30.0                 | 46.4                          | 41.9           | 55.0               | 9.5                              | 24.7                 |
| Pennsylvania         | 57.7                                     | 51.9           | 67.3               | 33.7                             | 45.2                 | 48.1                          | 42.6           | 57.4               | 26.6                             | 26.9                 |
| Rhode Island         | 64.4                                     | 60.6           | 71.4               | 14.1                             | ¶                    | 68.3                          | 67.1           | 70.6               | 17.7                             | ¶                    |
| South Carolina       | 55.0                                     | 50.0           | 65.0               | 22.4                             | 24.0                 | 49.3                          | 45.7           | 56.5               | 18.8                             | 21.8                 |
| South Dakota         | 60.7                                     | 52.4           | 75.0               | 28.3                             | 32.0                 | 49.9                          | 44.3           | 59.4               | 19.2                             | 34.8                 |
| Tennessee            | 51.4                                     | 48.3           | 57.3               | 24.6                             | 19.7                 | 45.0                          | 43.8           | 47.3               | 27.4                             | 23.6                 |
| Texas                | 54.1                                     | 47.7           | 67.4               | 20.4                             | 24.9                 | 44.0                          | 38.6           | 55.4               | 19.2                             | 23.9                 |
| Utah                 | 46.7                                     | 41.1           | 57.5               | 18.2                             | ¶                    | 38.8                          | 34.1           | 48.3               | 15.5                             | ¶                    |
| Vermont              | 50.9                                     | 45.3           | 62.3               | 19.7                             | 33.7                 | 54.0                          | 51.0           | 60.0               | 24.1                             | 33.0                 |
| Virginia             | 59.6                                     | 50.9           | 76.6               | 28.3                             | 31.8                 | 55.6                          | 48.7           | 69.3               | 29.0                             | 29.3                 |
| Washington           | 51.1                                     | 45.9           | 62.0               | 18.6                             | 17.8                 | 49.3                          | 46.4           | 55.5               | 19.7                             | 21.1                 |
| West Virginia        | 59.1                                     | 50.6           | 73.0               | 23.4                             | 31.5                 | 45.0                          | 37.2           | 57.7               | 22.9                             | 16.8                 |
| Wisconsin            | 51.1                                     | 46.3           | 61.1               | 18.7                             | 15.2                 | 48.6                          | 45.4           | 55.2               | 16.9                             | 29.7                 |
| Wyoming              | 62.3                                     | 57.9           | 71.9               | 37.3                             | 30.3                 | 37.2                          | 31.6           | 49.3               | 13.3                             | 10.9                 |
| United States#       | 55.9                                     | 50.0           | 66.9               | 23.1                             | 26.1                 | 48.9                          | 44.8           | 56.7               | 20.4                             | 22.9                 |
| Range                | 46.4-65.2                                | 38.7-60.6      | 56.8-78.8          | 10.5-37.3                        | 12.4-47.2            | 35.2-68.3                     | 29.3-67.1      | 44.5-70.6          | 9.5-31.9                         | 9.5-42.4             |

\*A prostate-specific antigen test within the past year for men 50 and older who reported they were not told by a doctor, nurse, or other health professional they had prostate cancer. †A digital rectal exam within the past year for men 50 and older who reported they were not told by a doctor, nurse, or other health professional 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 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 for definition.

**Source:** Behavioral Risk Factor Surveillance System 2008, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2009. American Cancer Society, Surveillance Research, 2011



randomized trials were initiated in the US and Europe. The largest trial, the National Lung Screening Trial, was designed to assess whether screening individuals at high risk for lung cancer with spiral CT was associated with fewer lung cancer deaths from screening with chest x-ray. Launched in 2002, the National Cancer Institute study included more than 53,000 current or former smokers with a minimum 30 pack-year (e.g., smoking one pack of cigarettes per day for 30 years) smoking history who were randomly assigned to three lung cancer screenings with either LDCT or chest x-ray.<sup>201,202</sup> The trial was stopped in October 2010 after early results showed 20% fewer lung cancer deaths in participants screened with LDCT.<sup>155,201</sup> Organizations that issue screening guidelines will need to carefully examine these new findings as well as the historical literature and determine whether there is sufficient evidence to endorse periodic screening of a subpopulation of adults at elevated risk for lung cancer, and whether the potential benefits outweigh the potential harms. The possible risks associated with LDCT screening include cumulative radiation exposure from multiple scans and unnecessary biopsy and surgery in individuals who do not have lung cancer (false positives).

### **Cancer Screening Obstacles and Opportunities to Improve Cancer Screening Utilization**

Access to affordable, quality health care continues to be a fundamental policy priority for the American Cancer Society. People who lack health insurance have less access to preventive care and are less likely to get timely cancer screening examinations.<sup>203</sup>

Furthermore, studies have shown that those who lack health insurance are more likely to be diagnosed at an advanced stage of cancer, when survival rates are much lower and treatment is more expensive.<sup>159,168</sup> These patients often face much more difficult and far more extensive medical treatments, as well as a diminished quality of life – avoidable outcomes if they had the same level of access as insured patients to the current advances in cancer prevention, detection, and treatment options.

In people aged 65 and older, health insurance coverage is nearly universal because of the Medicare program.<sup>204,205</sup> In contrast, health insurance coverage in the population under the age of 65 varies depending on age, employment status, and other factors. For example, 21.5% of adults aged 18 to 64 had no health insurance coverage in 2010.<sup>206</sup> As a group, uninsured adults are more likely to have a lower income, to be Hispanic or African American, or have less education.<sup>203,207</sup> Among adults aged 18 to 64, it is estimated that 15.7% had Medicaid coverage and 55.8% had employer-sponsored coverage.<sup>208</sup> Even among the employed, changes in employment status can also affect health care coverage.<sup>204</sup> The number of uninsured Americans is 50 million, and millions more face shrinking coverage, higher deductibles, and periods without insurance.<sup>209</sup> Recent reports document that higher-paid workers are more likely than their lower-paid counterparts to have health insurance and health-related benefits, such as paid sick leave and coverage for preventive care services. Lower-paid workers and uninsured persons are much more likely to delay or forgo needed health care because of cost and to report difficulty paying medical bills.<sup>210,211</sup>

Clinicians and the health care systems play a major role in enabling patient participation in cancer screening and ensuring quality services. Research on barriers related to cancer screening in the population shows that multiple factors – public policy, organizational systems and practice settings, clinicians, and the patients themselves – influence cancer screening and that a diverse set of intervention strategies targeted at each of these can improve cancer screening rates.<sup>70,212</sup> Studies have shown that people who receive a clinician's recommendation for cancer screening are more likely to be screened than those who do not receive a recommendation.<sup>70,212</sup> To maximize the potential impact of interventions for improving cancer screening, a diverse set of strategies should be implemented. These include centralized or office-based systems including computer-based reminder systems to assist clinicians in counseling age-/risk-eligible patients about screening, as well as organizational support systems to help manage referrals and follow up of cancer screening tests.<sup>70,212-214</sup> In addition, multiple interventions directed at patients (strategies to raise awareness about the importance of cancer screening), physicians (strategies for cancer screening counseling and follow up), and health care systems (strategies to ensure the delivery of high-quality and timely cancer screening) may provide the best approaches to improving rates of cancer screening.<sup>212,215</sup>

Efforts among the American Cancer Society and its partners in the nonprofit sector, health care, and government are under way to implement interventions, integrate screening into routine care, and address health disparities through health care reform.

For decades, our nation's health care system has not adequately met the needs of people with cancer, many of whom were denied coverage due to pre-existing conditions, has offered inadequate policies that did not cover necessary preventive, diagnostic, or treatment services, or has charged fees unaffordable to many patients. In March 2010, Congress passed and the president signed health care reform legislation that included approximately 160 provisions that will meaningfully improve the health care system for cancer patients. Some of these provisions have already gone into effect, and many more will be implemented over the upcoming months and years.

Many of the provisions already implemented improve access to insurance coverage, especially for people afflicted with illness or chronic diseases. For instance, cancer patients now have access to high-risk pools that offer coverage to uninsured people with pre-existing conditions, and children can no longer be denied insurance coverage due to a pre-existing condition. In addition, coverage cannot be dropped because of technical mistakes on applications, and lifetime limits have been removed from all plans. Preventive care has also taken a new centralized role. Medicare and new insurance plans are now required to cover some preventive services, including breast, cervical, and colorectal cancer screening, at no cost to patients. Over the coming months and years, many more provisions will be implemented that will increase access to health care for both cancer patients and the most uninsured individuals:

#### 2011

- Lifesaving preventive services will be free to Medicare beneficiaries.
- Medicare beneficiaries will receive a free annual wellness visit and a personalized prevention plan.

#### 2013

- Health insurance will be made more administratively simple through a uniform set of rules for verifying eligibility and claims status and for making payments.

#### 2014

- Pre-existing condition exclusions will be eliminated for everyone with private insurance.
- Health benefit exchanges will be created in every state, which will enable people to shop for insurance and compare health plans.
- Insurance companies will be required to issue plans to all applicants and will be prohibited from charging higher rates based on health status.



- Waiting periods for coverage will be limited to 90 days.
- A package of essential health benefits will be created that all plans sold in the exchanges will be required to offer.
- Medicaid will be expanded to cover all people with incomes up to 133 percent of the Federal Poverty Level (FPL), and subsidies to purchase insurance will be offered to those earning 133-400 percent of the FPL.
- Limits on the amount patients pay in out-of-pocket costs and deductibles will go into effect.

These provisions and many others will dramatically improve the number of people with access to care. However, even with these great advances, it is still vitally important to protect many of the federal programs that support cancer screening, diagnosis, and care since health care reform still leaves some people without access to affordable coverage.

ACS CAN is continuing their efforts to ensure that all aspects of the new law are strengthened through continuing legislative and regulatory processes and to ensure that important federal programs are protected.

More information about ACS CAN's efforts in support of meaningful health care reform can be found in a recent online resource titled *The Affordable Care Act: How It Helps People With Cancer and Their Families*, available at [action.acscan.org/site/DocServer/Affordable\\_Care\\_Act\\_Through\\_the\\_Cancer\\_Lens\\_Final.pdf?docID=18421](http://action.acscan.org/site/DocServer/Affordable_Care_Act_Through_the_Cancer_Lens_Final.pdf?docID=18421) or visit [acscan.org/healthcare](http://acscan.org/healthcare).

# Statistical Notes

## Sample Surveys

In measuring the **prevalence** of certain behaviors in a **population**, it is usually costly and unfeasible to survey every person. Therefore, 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; therefore, results are considered applicable to the entire population that the sample represents. All of the adult and youth statistics presented in this publication have been **weighted** and are estimates of the true prevalence in the population. 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, in 2004, 60.5% of Florida women aged 40 years and older had a mammogram within the past year. The percentage of people exhibiting the behavior is 60.5%, and the defined population is women aged 40 and older living in Florida in 2004.

**Population:** A group of people defined by the survey. For example, the Behavioral Risk Factor Surveillance System (BRFSS) targets adults 18 and older, and the Youth Risk Behavior Surveillance System (YRBSS) targets students in grades 9 through 12 at public and private high schools.

**Population-based surveys:** A survey conducted to estimate the prevalence of a disease, risk factor, 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 a given city or state, or nationwide.

**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 a given city, state, or nationwide. 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 or state, or nationwide. 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 or state, or nationwide). For example, BRFSS data in this publication are representative of all non-institutionalized, civilian adults with telephones. The YRBSS data in this publication are representative of all public and private high school students in grades nine through 12.

**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.

**Data quality:** The sources of data used for this report are from government-sponsored national and state systems of behavioral surveillance. These systems employ systematic, standardized techniques for sampling and use the latest advances in survey research methodology to survey targeted population groups on an ongoing basis in order to monitor a variety of characteristics (e.g., behaviors). The design and administration of these surveillance systems can provide sources of good-quality data from which to derive population estimates of specific behaviors in a targeted population. However, factors such as cost, feasibility, and practical aspects of monitoring behaviors in the population may play a role in data quality. Therefore, the data reported in this report are subject to three limitations. First, with regard to telephone-based surveys such as the BRFSS, the participants are those from households with a telephone. Second, both in-person and telephone surveys have varying proportions of individuals who do not participate for a variety of reasons (e.g., cannot be reached during the time of data collection or refused to participate once reached). Third, survey measures in general are based on self-reported data, which may be subject to recall bias and cannot be easily validated.

## 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 accompanying table reports the confidence interval ranges for the survey data. Example: The confidence interval range for current cigarette smoking among adults is between 0.7% and 2.7%. The narrowest confidence interval is around the percentage for Washington (16.8%±0.7%) or (16.1, 17.5), and the percentage for Alaska has the widest range of possible values (22.2%±2.7%) or (19.5, 24.9).

## 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 nationwide. The survey design varies; 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’s (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 years and older, living in households in a state or US territory. The BRFSS is an annual survey, and all 50 states, the District of

**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 (unlikely that the association occurred by chance).

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

**US definition for state tables:** The state-based BRFSS data were aggregated to represent the US. Thus, the median BRFSS values for all US states/territories published by the Centers for Disease Control and Prevention (CDC) will differ from these. Due to the differences in sampling methodology and survey methods, this percentage may not be the same as the percentage reported by the National Health Interview Survey (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                             | ± 1.0% to 4.7%  |
| 1B    | Current cigarette smoking, adults 18 and older                                     | ± 0.8% to 2.5%  |
|       | Current cigarette smoking, men 18 and older  | ± 1.3% to 4.0%  |
|       | Current cigarette smoking, women 18 and older                                      | ± 0.9% to 3.3%  |
| 2A    | Overweight, high school students, total  | ± 0.8% to 2.5%  |
|       | Met currently recommended levels of physical activity, high school students, total | ± 1.2% to 4.9%  |
|       | Ate fruits and vegetables five or more times a day, high school students, total    | ± 1.2% to 3.3%  |
| 2B    | Clinical overweight, adults 18 and older   | ± 1.0% to 3.3%  |
|       | Clinical obese, adults 18 and older  | ± 0.9% to 2.6%  |
|       | No leisure-time physical activity, adults 18 and older                             | ± 0.8% to 2.6%  |
|       | Vigorous physical activity, adults 18 and older                                    | ± 1.0% to 3.4%  |
|       | Moderate physical activity, adults 18 and older                                    | ± 1.0% to 3.1%  |
|       | Eating five or more fruits and vegetables a day, adults 18 and older               | ± 0.7% to 2.8%  |
| 4B    | Recent mammogram, women 40 and older   | ± 1.2% to 4.5%  |
|       | Recent mammogram, women 65 and older   | ± 1.8% to 9.2%  |
| 4D    | Recent Pap test, women 18 and older  | ± 1.2% to 4.2%  |
|       | Recent Pap test, women 65 and older  | ± 2.6% to 13.2% |
| 4F    | Recent fecal occult blood test, adults 50 and older                                | ± 0.7% to 2.2%  |
|       | Recent sigmoidoscopy or colonoscopy, adults 50 and older                           | ± 1.0% to 4.1%  |
| 4H    | Recent prostate-specific antigen test, men 50 and older                            | ± 1.8% to 6.2%  |
|       | Recent digital rectal examination, men 50 and older                                | ± 1.7% to 6.1%  |

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 in 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 [cdc.gov/brfss/](http://cdc.gov/brfss/).

**National Health and Nutrition Examination Survey (NHANES).** The NHANES is a survey of the CDC's 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 [cdc.gov/nchs/nhanes.htm](http://cdc.gov/nchs/nhanes.htm).

**National Health Interview Survey (NHIS).** The NHIS is a survey of the CDC's 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 years and older living in households in the US. The NHIS is an annual survey and has been conducted by NCHS since 1957. For more information, visit the NHIS Web site at [cdc.gov/nchs/nhis.htm](http://cdc.gov/nchs/nhis.htm).

**National Youth Tobacco Survey (NYTS).** The NYTS was conducted by the CDC in 2004 and 2006, and the latest survey was conducted in 2009. 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 has and has subsequently been conducted every other year.

**Tobacco Use Supplement to the Current Population Survey (TUS-CPS).** The TUS-CPS is a National Cancer Institute (NCI)-sponsored survey of tobacco use that has been administered as part of the US Census Bureau's Current Population Survey in 1992-1993, 1995-1996, 1998-1999, 2000, 2001-2002, 2003, and 2006-2007. The Centers for Disease Control and Prevention (CDC) has been a co-sponsor with NCI since 2001-02. The TUS-CPS is a large, nationally representative sample of civilian, non-institutionalized population ages 15 years and older and provides national, state, and some substate-specific estimates on smoking and other tobacco use in the US household population. About 70% of respondents conduct the survey by telephone, and 30% of respondents conduct the survey in person. Responses are mostly self-reports (about 20% are by proxy for a few measures of use). For more information, visit the TUS-CPS Web site at [riskfactor.cancer.gov/studies/tus-cps/](http://riskfactor.cancer.gov/studies/tus-cps/)

**Youth Risk Behavior Surveillance System (YRBSS).** The YRBSS is a survey of the CDC's 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, page 50.) 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. Beginning with the 2003 survey, state data that do not meet the weighting requirements described above will no longer be made publicly available through the CDC. For more information, visit the YRBSS Web site at [cdc.gov/HealthyYouth/yrbs/index.htm](http://cdc.gov/HealthyYouth/yrbs/index.htm).

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