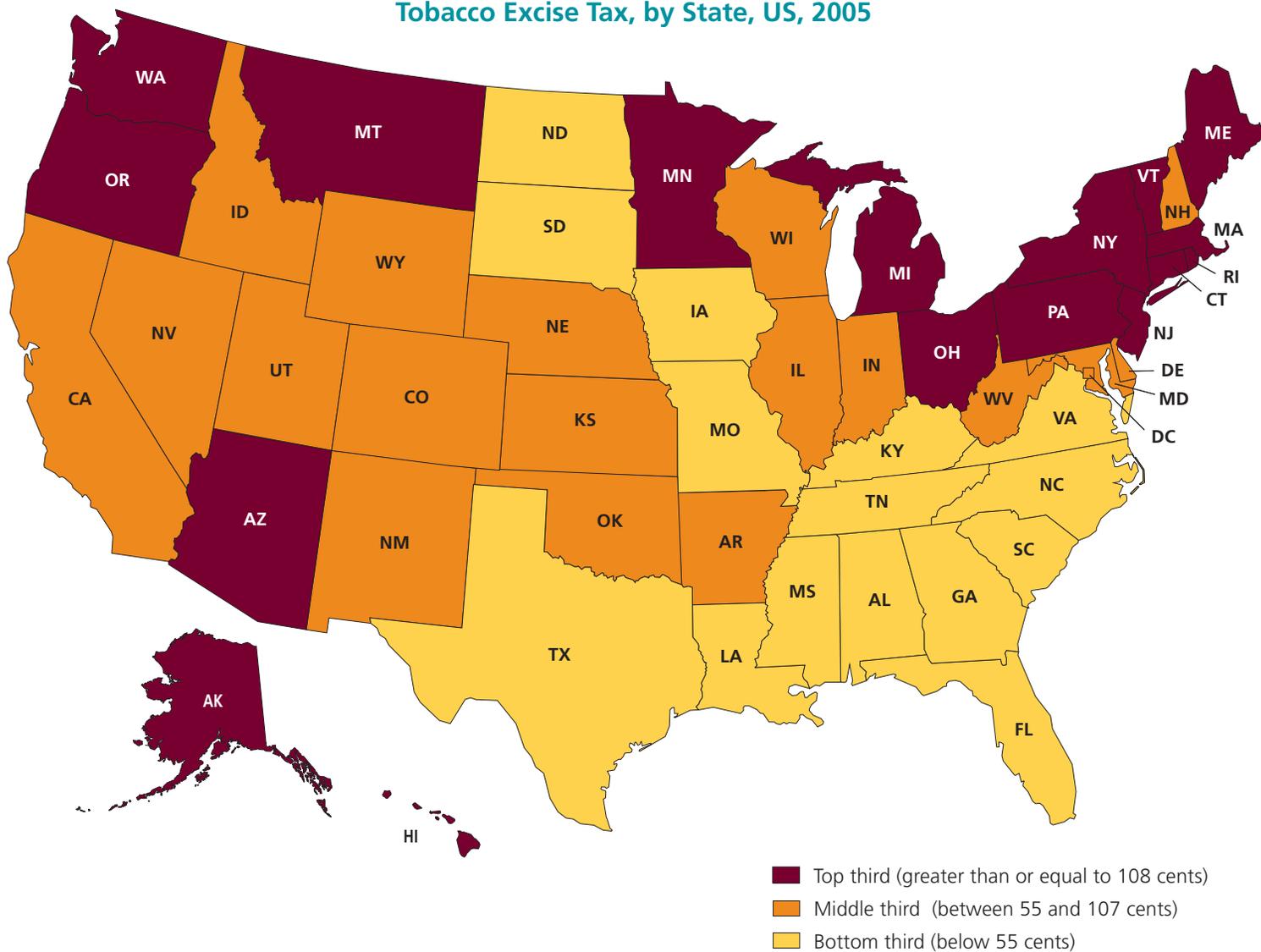


# Cancer Prevention & Early Detection Facts & Figures

# 2006

Tobacco Excise Tax, by State, US, 2005



Source: National Conference of State Legislatures (NCSL) and Federation of Tax Administrators. Provided by National Government Relations Department, American Cancer Society, 2005.

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

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# Preface

Tobacco use, physical inactivity, obesity, and poor nutrition are major preventable causes of cancer and other diseases in the US. The American Cancer Society estimates that in 2006, more than 170,000 cancer deaths will be caused by tobacco use alone. In addition, scientists estimate that approximately one-third (188,277) of the 564,830 cancer deaths expected to occur in 2006 will be related to poor nutrition, physical inactivity, overweight, and obesity.<sup>1-3</sup> Many deaths from cancers of the breast, colon, rectum, and uterine cervix could also be prevented by greater use of established screening tests. While these categories overlap and cannot simply be added to determine the total number of fatal cancers that could be prevented, a conservative estimate is that at least half of all cancer deaths could in principle be avoided by the application of existing knowledge.

To support cancer control efforts, the American Cancer Society has published *Cancer Prevention & Early Detection Facts & Figures* (CPED) annually since 1992. CPED is a resource for American Cancer Society staff, volunteers, and others working to strengthen cancer prevention and early detection efforts at the local, state, and/or national level. CPED complements the Society's companion publication, *Cancer Facts & Figures*, by providing current information on the prevalence of modifiable risk factors for cancer and the utilization of screening tests that can detect cancer early, when chances of successful treatment are greatest. CPED includes information on the burden of disease, death, and economic costs attributable to factors such as tobacco use, obesity, physical inactivity, and under-usage of established screening tests, and it identifies social, legislative, and economic factors that influence individual behaviors that affect cancer risk. It also describes best practices for reducing tobacco usage by

## Highlights, CPED 2006

- Progress continues to be made in reducing tobacco use. Per capita cigarette consumption is now at the lowest point since the start of World War II. Fifteen states have implemented statewide smoking bans that prohibit smoking in workplaces and/or restaurants and/or bars. The percentage of high school students who smoke decreased from 36% in 1997 to 22% in 2003. Between 1997 and 2004, the percentage of adults who smoke decreased from 27.6% to 23.4% in men and from 22.1% to 18.5% in women. Progress has been made despite an increase to \$15.15 billion in industry expenditures on domestic cigarette marketing (nearly 23 times the funding for tobacco control in 2003). Further progress can be made by increased funding for state comprehensive tobacco control programs, increased excise taxes on cigarettes, and using excise tax revenues to fund tobacco control programs.
- Increasing levels of overweight and obesity among children and adults are now a major threat to America's health. Overweight children often become obese as adults. Obesity increases the risk of developing and dying from a number of cancers as well as heart disease, diabetes, and other health problems. The proportion of children aged 6-19 who are overweight has tripled over the past three decades and it appears that this trend is continuing. The percentage of adults who are obese rose from 15% in 1976 to 31.1% in 1999-2002. Caloric intake from sweetened beverages among children and adolescents increased by 115% between 1977 and 2001, and the levels of physical activity among adults and children remained generally low. Recommendations have been developed to counteract the rising rates of obesity and overweight among children and adults. This report highlights approaches that can be taken at the national, state, and local levels to promote physical activity and healthy nutritional choices, thereby restoring caloric balance.
- Although screening rates for cervical and breast cancer have increased over the past decade, only 55% percent of women aged 40 and older report getting a mammogram in the past year; 79% of adult women report having a Pap test in the past three years. Screening rates are lower for people who are uninsured, have low levels of education, or have immigrated to the United States within the last five years. Early detection of prostate cancer with PSA testing is widely practiced and may have contributed to recent declines in mortality for this disease, although the benefit of PSA screening on mortality has not yet been documented in a randomized trial. Although there is strong evidence that colorectal cancer screening can both prevent colorectal cancer and detect it early, fewer than half of Americans for whom testing is recommended have had a recent screening test. The American Cancer Society has advocated for state legislation ensuring insurance coverage for the full range of colorectal cancer screening. To date, 18 states and the District of Columbia have passed such legislation.

adults and children, and highlights success stories in community efforts to reduce tobacco dependence, increase physical activity, and improve dietary patterns.

Although the report is divided into separate sections that discuss cancer prevention in children and adolescents, and prevention and early detection in adults, these topics are interrelated. Many of the strategies that foster positive behaviors at one age continue to have a beneficial effect on health throughout life.

Issues relating to 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 eliminate cancer as a major public health problem by preventing cancer, saving lives, and diminishing suffering from cancer, through research, education, advocacy, and service.

In 1999, the Society set bold challenge goals for the nation that, if met, would significantly lower cancer incidence and mortality rates and improve the quality of life for all cancer survivors by the year 2015. The American Cancer Society has also developed nationwide objectives that set the framework for achieving the 2015 goals (see below). These objectives can be achieved by improved collaboration between government agencies, private companies, other nonprofit organizations, health

care providers, policy makers, insurers, and the American public.

Factors in the physical and social environment profoundly influence individual health behaviors.<sup>4,5</sup> For example, the price and availability of healthy foods, the incentives and opportunities for regular physical activity in schools and communities, and the integration of preventive health services into standard medical care influence patterns of diet, physical activity, screening, and counseling or treatment for tobacco dependence and obesity.

Public policy and legislation at the federal, state, and local levels can increase access to preventive health services, including cancer screening.<sup>6</sup> For example, at the federal level, the American Cancer Society has advocated for increased funding of the CDC's National Breast and Cervical Cancer Early Detection Program (NBCCEDP) to assist low-income and uninsured women to obtain screening and treatment, if diagnosed. 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. This and other community, policy, and legislative initiatives will be 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 use tobacco products.

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

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

**Physical Activity:** Increase to 90% the proportion of high school students and to 60% the proportion of adults who follow American Cancer Society guidelines with respect to the appropriate level of

physical activity as published in the American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention.

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

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

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

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

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

# Children and Adolescents

The health of young people and the adults they will become is linked to the starting of healthy behaviors in childhood.<sup>7</sup> Risk factors such as tobacco addiction, unhealthy dietary patterns, and physical inactivity during childhood and adolescence can result in life-threatening cancers, cardiovascular diseases, and other major illnesses later in life.<sup>7</sup> It is far easier to establish healthy practices early in life than to change behaviors later. For example:

- About half of youngsters who are overweight as children and about 70% of those who are overweight by adolescence will remain overweight as adults.<sup>5,8</sup>
- Physically active children are more likely to grow up to be physically active adults, while inactive children and youth are much more inclined to be sedentary adults.<sup>9</sup>
- Almost 90% of current adult smokers became addicted to tobacco at or before age 18.<sup>10</sup>

The nation's 129,000 public and private elementary and high schools (grades K to 12) currently enroll more than 50 million students, providing a framework and opportunity for delivering prevention programs that can help children establish healthy lifestyle habits for life.<sup>7</sup>

Furthermore, children are greatly influenced by their social environment and the public policies that shape it. For instance, adolescents are more likely to begin smoking if their film idols smoke in movies, their favorite sport is sponsored by a tobacco company, they see people smoking all around them, and if tobacco products are cheap and readily available.<sup>10,11</sup>

Similarly, children are more likely to engage in sports and other forms of physical activity if safe and enjoyable participation in these activities is encouraged at school, in after-school care programs, and in their communities.<sup>12</sup> Children who can walk or bike to school safely are more likely to do so.<sup>12</sup> Community support, public health policy, and legislation offer multiple opportunities to improve the health behavior of future generations.

## Youth Tobacco Use

Almost everyone who uses tobacco in the US began as an adolescent. Although the percentage of high school students who smoke cigarettes decreased from 1977 to 2003,<sup>13</sup> the rate of decrease appears to be slowing as no significant decrease was seen from 2002 to 2004.<sup>14</sup> In 2004, data from the National Youth Tobacco Survey showed that 21.7% of high school students and 8.4% of

middle school students reported smoking at least one day in the last 30 days. About 10% of high school students reported frequent smoking (defined as smoking for 20 or more of the last 30 days).<sup>14,15</sup> Table 1A provides available state and city level data on current and frequent cigarette smoking for 2003. According to the Monitoring the Future survey, cigarette smoking varies by race/ethnicity among 12th graders, with the highest prevalence among non-Hispanic whites, then among Hispanics/Latinos, and the lowest prevalence among African Americans (Figure 1A).

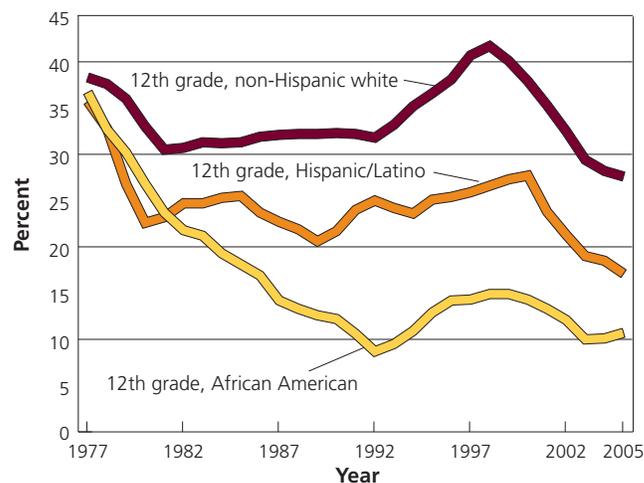
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## Trends Over Time

The prevalence of current cigarette smoking declined significantly from 1977 to 2003, although the rate of decrease may be slowing.<sup>13,14</sup> The same pattern of trends was seen among white, African American, and Hispanic/Latino high school students (Figure 1A). The decreases in smoking among high school students can be attributed, at least in part, to rising cigarette prices, restrictions on public smoking, and counter-advertising.<sup>16-19</sup> In recent years, the majority of states in the nation have increased their cigarette excise taxes, some of them repeatedly, and smoking restrictions in public places have steadily increased in many communities.<sup>20,21</sup>



**Figure 1A. Current\* Cigarette Smoking Among 12th Graders, by Race/Ethnicity, US, 1977-2005**



\*Used cigarettes in the last 30 days.

Source: Monitoring the Future Survey, 1975-2005, University of Michigan.

American Cancer Society, Surveillance Research

**Table 1A. Tobacco Use, High School Students, by State and City, US, 2003**

Location	% Current cigarette smoking*	Rank†	% Frequent cigarette smoking‡	% Current cigar use§	% Current smokeless tobacco use¶
<b>United States</b>	21.9		9.7	14.8	6.7
<b>State</b>		(out of 32 states)			
Alabama	24.7	21	12.6	13.0	10.5
Alaska	19.2	5	8.0	7.8	11.2
Arizona	20.9	10	7.3	14.2	4.8
Delaware	23.5	17	12.1	12.2	3.4
Florida	18.1	3	7.5	13.4	4.8
Georgia	20.9	11	8.7	13.9	7.6
Idaho	14.0	2	6.1	8.7	5.7
Indiana	25.6	25	12.4	14.7	7.2
Kentucky	32.7	32	18.4	18.7	13.7
Maine	20.5	9	10.1	11.1	4.3
Massachusetts	20.9	12	9.5	11.8	4.1
Michigan	22.6	15	11.3	13.6	6.5
Mississippi	25.0	24	12.0	18.4	8.2
Missouri	24.8	22	13.6	13.3	5.7
Montana	22.9	16	10.8	14.1	13.2
Nebraska	24.1	19	11.2	18.2	10.1
Nevada	19.6	7	8.8	N/A	3.6
New Hampshire	19.1	4	9.6	13.5	4.3
New York	20.2	8	9.2	8.5	4.2
North Carolina	24.8	23	12.4	N/A	N/A
North Dakota	30.2	31	16.0	13.0	10.3
Ohio	22.2	14	11.0	13.6	8.0
Oklahoma	26.5	27	12.8	17.4	12.7
Rhode Island	19.3	6	9.0	10.5	4.6
South Dakota	30.0	30	14.7	13.8	15.3
Tennessee	27.6	28	14.7	16.6	12.1
Texas#	24.3	20	7.9	14.6	6.8
Utah	7.3	1	3.0	7.3	3.1
Vermont	22.1	13	10.9	11.9	5.2
West Virginia	28.5	29	17.7	13.3	13.6
Wisconsin	23.6	18	11.6	N/A	7.9
Wyoming	26.0	26	13.3	14.7	13.3
<b>City</b>		(out of 18 cities)			
Boston, MA	13.1	6	3.8	8.8	2.2
Chicago, IL	16.9	16	5.6	15.6	3.5
Dallas, TX	18.1	18	4.0	17.0	2.7
Dekalb County, GA	9.5	3	2.5	8.8	2.3
Detroit, MI	9.1	1	1.7	7.2	3.2
District of Columbia	13.2	7	3.8	11.2	5.0
Ft. Lauderdale, FL	13.4	9	5.3	10.6	3.7
Los Angeles, CA	14.4	13	2.4	10.7	2.8
Memphis, TN	9.2	2	2.3	13.1	1.5
Miami, FL	13.5	10	4.6	10.2	2.4
Milwaukee, WI	13.6	11	6.3	N/A	5.5
New Orleans, LA	11.5	4	4.1	8.9	3.6
New York City, NY	14.8	14	5.3	5.5	1.6
Orange County, FL	16.0	15	5.2	11.1	2.4
Palm Beach, FL	17.0	17	8.2	14.2	3.5
Philadelphia, PA	13.9	12	5.9	5.2	2.4
San Bernardino, CA	12.4	5	3.1	10.4	3.7
San Diego, CA	13.2	8	3.4	12.0	2.5

\*Smoked cigarettes on one or more of the 30 days preceding the survey. †Rank is based on % current cigarette smoking from lowest to highest. ‡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. #Survey did not include students from one of the state's largest school districts. N/A = Data not available. **Note:** Data are not available for all states since participation in the Youth Risk Behavior Surveillance System is a voluntary collaboration between a state's departments of health and education.

**Source:** Youth Risk Behavior Surveillance System, 2003, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention. *MMWR Morb Mortal Wkly Rep.* 2004;53(SS-2).

American Cancer Society, Surveillance Research

## Patterns of Smoking Initiation in Youth

Children begin to experiment with cigarettes at young ages. About 26.3% of middle school students and 51.9% of high school students have tried cigarette smoking.<sup>15</sup> Progression to established smoking (current smoking) among adolescents is strongly associated with age. Experimentation appears to peak at ages 13-14, while the proportion of adolescents who are established smokers rises steadily from ages 11 to 18.<sup>22</sup> For young children, whose lungs are developing, the addictive and toxic properties of tobacco smoke may be even worse than for adults.

Exposure to tobacco industry promotions increases the likelihood that adolescents will experiment with cigarettes and ultimately begin to smoke.<sup>22,23</sup> Although direct and indirect tobacco marketing to children is prohibited by the 1998 Master Settlement Agreement between states and tobacco companies, a variety of marketing strategies that appeal to children are still employed by the tobacco industry. These include marketing of candy-flavored cigarettes, prominent displays in convenience stores, and advertisements in magazines that reach children.<sup>24,25</sup> Promotions that specifically target young people include discounting cigarettes, sponsoring sporting events and giving or exchanging for empty cigarette packs T-shirts, caps, sporting goods, and other items bearing a cigarette brand's logo.<sup>26</sup>

One study showed that young people who were exposed to tobacco marketing (whether or not they owned a promotional item displaying a tobacco logo or could name a brand whose advertisements attracted their attention) were more likely to start smoking, and more than twice as likely to become an established smoker.<sup>23</sup>

## Cessation Support for Young Smokers Who Want to Quit

Encouragement and support in quitting smoking is important for adolescent smokers for several reasons.

- The opportunity to prevent diseases caused by smoking is greatest when smokers quit early.<sup>14</sup>
- Adolescents often underestimate the strength and rapidity of tobacco dependence.<sup>27</sup> Nicotine dependence has been shown to develop soon after initiation and lead to smoking intensification, with one study showing that approximately 20% of adolescents reported nicotine dependence symptoms within one month of beginning regular smoking.<sup>28</sup>
- Adolescents generally overestimate their ability to successfully quit smoking, helping them rationalize

continuing to smoke. One study of 12th-grade daily smokers found only 3% thought that they would “definitely” be smoking in 5 years, yet 7 to 9 years later, more than 60% of them were still smoking.<sup>29</sup>

- Most adolescent smokers who try to quit by themselves are unsuccessful.<sup>10,30</sup>

In 2004, 55.4% of high school and 49% of middle school current smokers expressed a desire to quit smoking, and about 58% of current high school smokers and 65% of those in middle school made an attempt to quit in the preceding 12 months (Figure 1B). A higher percentage of middle school (66.9%) and high school girls (63%) who smoke tried to quit compared to boys (middle school – 62.3%; high school – 51.8%). Quitting attempts by race and ethnicity varied only slightly among high school students who smoke cigarettes: 65.1% in non-Hispanic African American males, 56.5% in non-Hispanic whites and 57.7% in Hispanics.

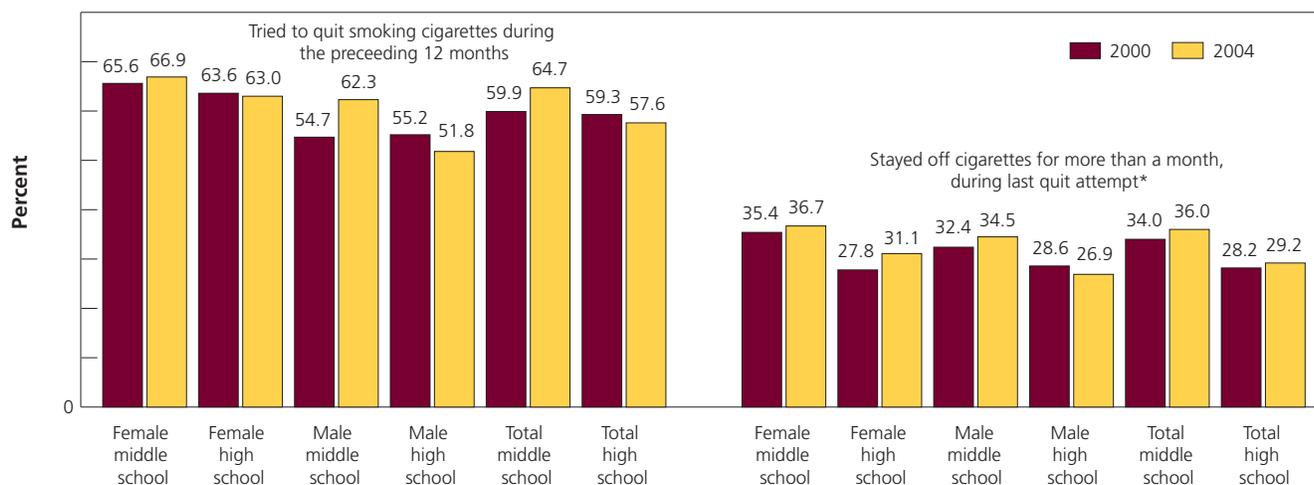
Although a high proportion of young smokers want to quit smoking and have attempted to quit, smoking abstinence rates of one month or more were low. About 29.2% of high school current smokers and 36.0% of middle school current smokers who tried to quit in the preceding 12 months were successful at staying off cigarettes for more than a month (Figure 1B). In 2004, only 14.7% of high school current smokers and 10.8% of middle school current smokers were told by a doctor, dentist, or a nurse to stop smoking, similar to smoking counseling rates in 2000.<sup>31</sup> These data highlight the importance of increasing efforts to provide children and adolescent smokers with appropriate resources and support to quit successfully (see sidebar, page 7).

## Comprehensive Approach to Youth Tobacco Control

Studies have shown that comprehensive tobacco control programs that include increases in excise taxes, effective antitobacco media campaigns, and restrictions on smoking in public places reduce adolescent smoking.<sup>4</sup> Other useful approaches to curbing youth smoking include establishing smoke-free school environments and restrictions on youth access to tobacco products.<sup>4</sup>

Young people who smoke are up to three times more responsive to price increases than adults.<sup>34</sup> States that have imposed higher excise taxes and raised the price of cigarettes have seen declines in youth smoking prevalence. Even though state excise taxes have risen in the past few decades, tobacco companies have increased the retail price of cigarettes at a much faster rate, using this revenue to counter tobacco control efforts (Figure 1C).

**Figure 1B. Cessation Attempts and Smoking Abstinence, Middle and High School Current Smokers, US, 2000 & 2004**



\*Among current smokers who quit at least once in the past 12 months.

Source: 2004: National Youth Tobacco Survey Public Use Data File, 2004. Office on Smoking and Health, Centers for Disease Control and Prevention, 2005.

2000: Youth tobacco surveillance, United States, 2000. *MMWR CDC Surveill Summ.* 2001 Nov 2;50(4):1-84.

American Cancer Society, Surveillance Research

School-based tobacco prevention programs can be effective as part of comprehensive tobacco control programs.<sup>4</sup> Because children often begin smoking at such young ages, smoking prevention classes are needed from elementary school to high school.<sup>4</sup> The Surgeon General recommends that tobacco prevention begin by sixth grade, and currently 38 states require that tobacco use prevention be taught in elementary schools.<sup>35</sup> Nationally, in 2004, 53.5% of middle school students and 20.6% of high school students reported that they were taught ways of saying “no” to tobacco use in at least one class, while 72.5% of middle school students and 42.6% of high school students reported being taught about the dangers of tobacco use. Because the long-term consequences of smoking seem remote to adolescent smokers, smoking prevention materials geared to youth should focus on the short-, as well as long-term, consequences of smoking, such as reduced athletic performance, their manipulation and exploitation by the tobacco companies, and reduced physical attractiveness because of bad breath and stained teeth and fingers.<sup>27,36</sup>

Strong smoke-free legislation may also form part of a comprehensive strategy to control youth tobacco use, and recent research indicates a relationship between such legislation and reduced adolescent smoking.<sup>19</sup> One study demonstrated that local restaurant smoking bans reduced progression from occasional to established smoking among adolescents.<sup>37</sup> At the state level, stronger clean-indoor air laws were related to lower levels of youth smoking.<sup>38</sup> These findings indicate that strong

smoke-free laws for schools and other educational institutions may further enhance the impact of comprehensive tobacco control programs for reducing youth smoking. Currently, with the exception of New Mexico and Wyoming, all states and the District of Columbia have enacted clean-indoor air laws restricting smoking in school buildings; however, just 16 states explicitly specify smoking restrictions in private schools.<sup>39</sup>

Antismoking media campaigns are effective in reducing smoking initiation in early adolescence.<sup>40</sup> The nationwide youth antismoking media campaign called “Truth” accounted for approximately 22% of the decline in youth smoking prevalence between 1999-2002.<sup>41</sup> States that have combined extensive paid media campaigns with other antitobacco activities have seen rapid declines in youth smoking prevalence.<sup>42</sup> Florida and Massachusetts are two states that have documented their antismoking media campaign activities and the effects on youth smoking reductions. In developing its “Truth” campaign, the Florida Governor’s Office worked with teen advisors to develop a media campaign that countered the perception of smoking as cool and rebellious. Significant declines in smoking prevalence were reported among middle and high school students following implementation of the program, with a 40% reduction from 1998 to 2000 among middle school students.<sup>4,42,43</sup> In 2001, teens in Florida had significantly lower smoking rates and intention to smoke in the future compared to their national counterparts.<sup>44</sup> The state of Massachusetts initiated a multi-faceted youth tobacco control program

## Youth Cessation Resource

The CDC recommends that all comprehensive tobacco control programs include cessation interventions for youth and adults.<sup>32</sup> However, the evidence for the effectiveness of smoking cessation treatments is more limited for children and adolescents than for adults. To address this issue, the Youth Tobacco Cessation Collaborative, a coalition of 10 public, private, and voluntary health organizations, including the American Cancer Society, convened an expert advisory panel to review existing scientific evidence on youth tobacco cessation.<sup>33</sup> The review concluded that there is evidence that treatment increases quit rates in adolescents, but the panel did not find sufficient evidence to recommend routine pharmacotherapy or specific types of delivery settings and interventions to aid youth smoking cessation.<sup>33</sup> The *Youth Tobacco Cessation: A Guide for Making Informed Decisions*, a document developed by the panel, is a useful resource to guide health professionals, policy makers, and researchers through the process of developing, implementing, and evaluating a youth tobacco cessation program. More information can be found at [http://www.cdc.gov/tobacco/educational\\_materials/cessation/youth\\_cess/](http://www.cdc.gov/tobacco/educational_materials/cessation/youth_cess/).

that included statewide media campaigns, community-based efforts, and school-based tobacco education. The implementation of these efforts was associated with a decline in youth smoking prevalence from 36% in 1995 to 30% in 1999.<sup>45</sup>

Since the 1998 Master Settlement Agreement with the states, tobacco marketing expenditures have increased by 125%, to \$15.15 billion in 2003. By comparison, states spent very little to counter these promotional efforts. In 2003, for every dollar spent in the US on tobacco control efforts, the industry spent almost \$23 to promote its products (Figure 1D). Tobacco control expenditures have declined to just \$ 550 million in 2006.

Recent research indicates that increased state tobacco control spending is associated with lower youth smoking prevalence and fewer cigarettes smoked,<sup>46</sup> but several of the most effective comprehensive tobacco control programs in the nation have now been jeopardized by severe budget cuts.<sup>47,48</sup> The tobacco control budget in Massachusetts was cut from \$48 million in 2002 to \$2.5 million in 2004, while in Florida, the budget was cut from

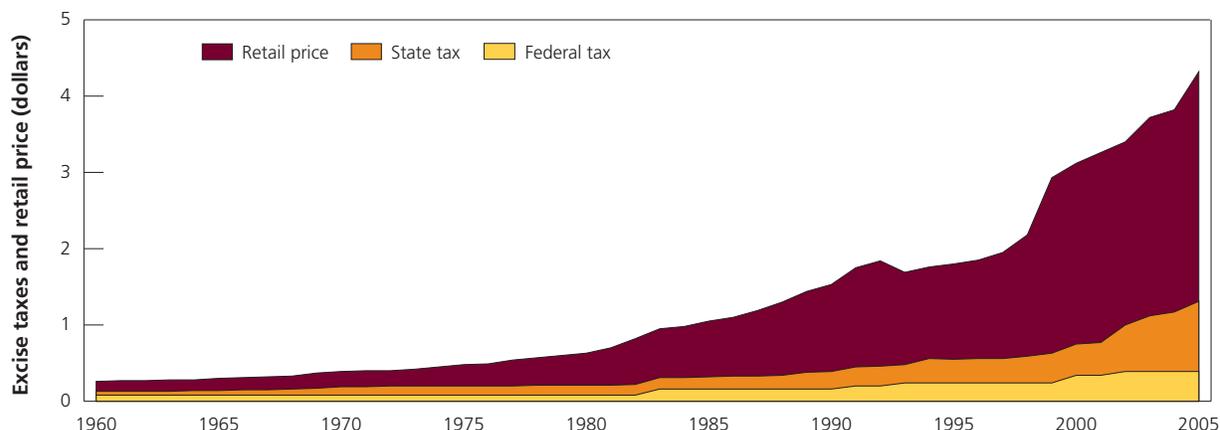
\$37.5 million in 2003 to \$1 million in 2004.<sup>49</sup> Minnesota's Target Market youth anti-tobacco campaign ended in 2003, after operating for three years, when funding was cut by more than 75%.<sup>50</sup> Adolescents aged 12-17 were surveyed during and after the campaign to measure their susceptibility to smoking (i.e., the percentage of youth who agree with the statement, "You will smoke a cigarette in the next year"). Six months after the campaign was stopped, susceptibility to smoking had significantly increased from 43% to 53%.<sup>50</sup>

Parental guidance is important in maintaining smoke-free households, setting nonsmoking expectations early, monitoring adolescents for signs of smoking, limiting exposure to adult media, and countering the influence of smoking depicted in movies and other media as glamorous or grown up.<sup>51</sup>

## Other Tobacco Products

While cigarettes remain the primary tobacco product used by youth, smokeless tobacco and cigars have grown in popularity. In 2004, 27.4% of high school students and

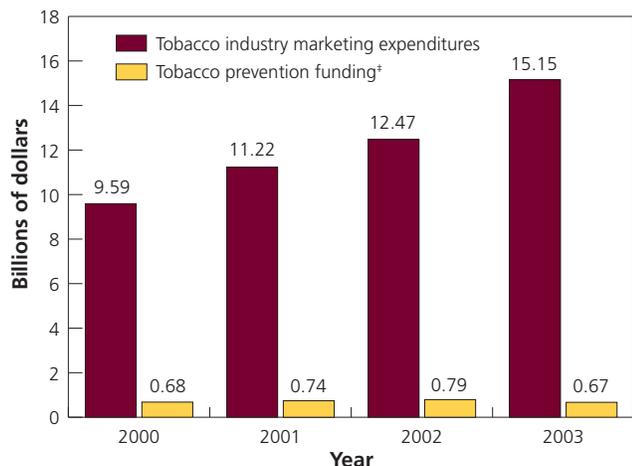
Figure 1C. Trends in State and Federal Excise Taxes and Retail Price, US, 1960-2005



Source: Orzechowski and Walker, 2003. The Tax Burden on Tobacco – Historical Compilation. Arlington, Virginia: 2005. Campaign for Tobacco Free Kids, 2005.

American Cancer Society, Surveillance Research

**Figure 1D. Tobacco Industry Expenditures on Cigarette Marketing\* vs. Tobacco Prevention Funding†, US, 2000-2003**



\*Marketing includes advertising and promotional expenditures. †Some tobacco prevention funding totals based on estimates calculated by the Campaign for Tobacco-Free Kids †Tobacco prevention funding is by Fiscal Year.

**Source:** Marketing expenditures: Federal Trade Commission, Federal Trade Commission Cigarette Report for 2003, Washington, DC, 2005. Tobacco Prevention Funding: Campaign for Tobacco-Free Kids. A Broken Promise to Our Children. The 1998 Master Settlement Agreement Seven Years Later. Washington, DC, 2005.

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11.8% of middle school students reported use of any tobacco product.<sup>14</sup> Among middle school students, 8.4% used cigarettes, 5.3% smoked cigars, 2.8% used smokeless tobacco, and 2.7% smoked pipes. Among high school students, 21.7% used cigarettes, 12.9% smoked cigars, 5.5% used smokeless tobacco, and 3.2% smoked pipes.<sup>14</sup>

Tobacco usage varies by race and gender. Non-Hispanic white and Hispanic/Latino students smoke predominantly cigarettes, while non-Hispanic African Americans were equally likely to smoke cigarettes and cigars. Male and female students were equally likely to smoke cigarettes, but males were eight times more likely to use smokeless tobacco and two times more likely to smoke cigars than females. Table 1A provides data on current cigar and smokeless tobacco use among high school students in states and cities for which data were available for 2003. Cigars were the second most popular type of tobacco in all states except South Dakota, Alaska, and West Virginia, where smokeless tobacco is second to cigarettes.<sup>52</sup>

Alternative tobacco products like bidis (small brown cigarettes from India made of tobacco wrapped in a leaf and tied with a thread) and kreteks (flavored cigarettes containing tobacco and clove extract) are used less commonly.<sup>14</sup> In 2004, 2.4% of middle and 2.7% of high school students used bidis on one or more of the 30 days preceding the survey.<sup>14,15</sup> Similarly, 1.6% of middle and

## Success Story

### California Tobacco Control Program – Preventing Youth Tobacco Use

In 1989, California became the first state in the nation to implement a comprehensive tobacco control program. The goals of this program included a) reducing exposure to secondhand smoke; b) reducing underage access to tobacco products; c) promoting smoking cessation; and d) countering the marketing strategies of the tobacco industry.<sup>55</sup> The program used community-based programs and statewide mass media and public relations campaigns to implement its activities.<sup>56</sup> By passing strong smoke-free legislation and spreading clear mass media messages about the dangers of tobacco use, the program sought to de-normalize tobacco use by changing social and cultural norms. Apart from these efforts, the program targeted youth smoking through a school-based tobacco control program funded through the Department of Education to implement tobacco prevention, education, and cessation programs for adolescents.<sup>55,56</sup>

The California program was successful in reducing the likelihood that young adolescents would begin smoking in the future.<sup>55</sup> The prevalence of ever puffing on a cigarette declined by 70% among 12-13-year-olds between 1990 and 2002, by 53% among 14-15-year-olds between 1993-2002, and by 34% among 16-17-year-olds between 1996-2002. Experimentation rates also declined among California's young adults. Researchers report that the group of teens exposed to the strong tobacco control atmosphere at the beginning of the program in California and who reached young adulthood by 2002 had a lower rate of experimentation compared to older groups.<sup>55</sup> Thus, the decline in California's youth smoking experimentation led to declines in smoking prevalence among young adults in this state, while in the rest of the country the smoking prevalence among young adults remained relatively constant.

2.5% of high school students used kreteks on one or more of the 30 days preceding the survey.<sup>14,15</sup> All forms of tobacco, however, are addictive and cause cancer and other life-threatening diseases, and use of any tobacco products by young smokers may hasten nicotine dependence.<sup>53</sup> Prevention and cessation programs should address other tobacco products as well as cigarettes.<sup>54</sup>

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

### Overweight and Obesity

The proportion of children ages 6-19 who are overweight has tripled over the past three decades. The dramatic increase in the percentage of overweight children and adolescents has occurred among boys and girls of all age groups and race/ethnicities, although Mexican Americans and African Americans experienced the greatest increase.<sup>57</sup> The most recent data indicate that 24.7% of Mexican American boys and 23.6% of African American

girls are overweight (Figure 1E). Table 1B shows the percentages of youth who are either at risk for becoming overweight or are overweight (see sidebar, page 11) in states and major cities in the US. The potential consequences of childhood obesity and overweight are enormous since overweight children tend to become overweight adults.<sup>58</sup> Moreover, some of the adverse health conditions seen in overweight and obese adults, such as type II diabetes and high cholesterol levels, are also appearing in overweight and obese adolescents.<sup>58</sup> The adverse effects of current levels of obesity on future risk for certain cancers, heart disease, type II diabetes, and other serious chronic diseases are staggering.<sup>59,60</sup>

Obesity occurs when caloric intake exceeds caloric expenditures (from metabolism and physical activity) over time. Even a small excess in caloric intake consumed over time may upset this delicate balance.<sup>61</sup> Physical activity, by itself, cannot offset large excesses in caloric intake. For example, 45 minutes of moderate physical activity are needed to burn off the calories in a 20-ounce soda.<sup>62</sup> Children and adolescents have significantly increased their consumption of sugar-containing beverages: between 1977-1978 and 1999-2001, the percentage of daily calories provided by sweetened beverages among 2-18-year-olds more than doubled, from 4.8% to 10.3%.<sup>63</sup>

There is broad consensus among medical and public health experts that countering the obesity epidemic among children and adolescents should be a national health priority. A Surgeon General's report in 2001, and more recently a 2004 report by the Institute of Medicine (IOM), emphasized the need to develop a comprehensive approach to address the problem.<sup>5,64</sup> The IOM report, *Preventing Childhood Obesity: Health in the Balance*, calls for coordinated efforts involving schools, communities, industry, and governmental and nongovernmental agencies to prevent and reduce obesity in American youth.<sup>64</sup>

A combination of increasing physical activity and reducing excess calorie consumption is needed to prevent obesity in children. In 2003, the American Academy of Pediatrics released specific recommendations for the prevention of obesity in children.<sup>58</sup> These include:

- Limiting television and video time to a maximum of 2 hours per day.
- Routinely promoting physical activity, including unstructured play at home, in school, in childcare settings, and throughout the community.
- Encouraging parents and caregivers to promote healthy eating patterns by offering nutritious snacks,

such as vegetables and fruits, low-fat dairy foods, and whole grains; encouraging children's autonomy in self-regulation of food intake and setting appropriate limits on choices; and modeling healthy food choices.

- Identifying children and adolescents in health care settings who are at risk due to family history, birth weight, or socioeconomic, ethnic, cultural, or environmental factors and track them annually through childhood and adolescence by calculating and plotting their body mass index (BMI) (see sidebar, page 11).
- Enlisting policy makers from local, state, and national organizations and schools to support healthy lifestyles for all children, including proper diet and adequate opportunity for regular physical activity.

### Television Viewing: A Modifiable Risk Factor

Watching television is one modifiable factor that may contribute to obesity in children.<sup>66</sup> On average, children and adolescents spend approximately 4.5 hours a day watching some kind of electronic screen, either television or video.<sup>67</sup> In 2003, 38.2% of US high school students reported watching three or more hours of television (Table 1B).

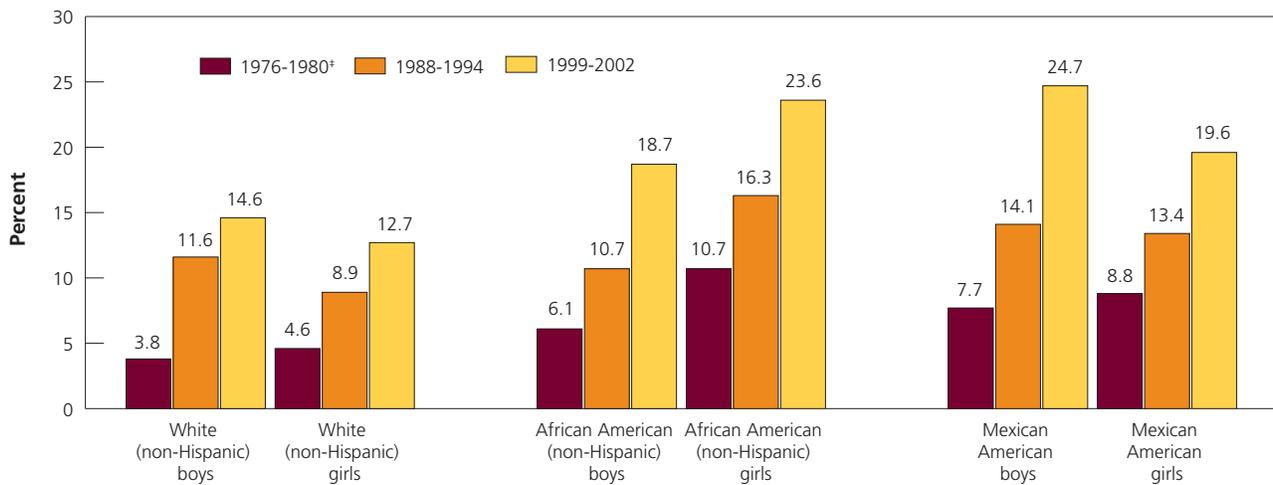


National surveys consistently show that the more hours children watch television, the greater their risk of being overweight.<sup>68,69</sup> Television watching:<sup>70</sup>

- Replaces calorie-burning exercise with sedentary behavior
- Bombards children and adolescents with advertisements for high-calorie, low-nutrient foods
- Encourages between-meal snacking.

Television viewing has been associated with poor eating habits and greater consumption of fast food and soft drinks. One study found that daily servings of fruit and vegetables decreased significantly among adolescents

**Figure 1E. Overweight\* Children and Adolescents, 12-19 Years of Age, by Gender & Race/Ethnicity†, US, 1976-2002**



\*Overweight is defined as body mass index (BMI) at or above the sex- and age-specific 95th percentile BMI cutoff points from the 2000 CDC Growth Charts: United States. †Persons of Mexican origins may be of any race. Data estimates for White (non-Hispanic) and African American (non-Hispanic) races for 1999-2002 may not be strictly comparable with estimates for earlier years because of changes in Standards for Federal Data on Race and Ethnicity. The differences in overweight estimates for current and earlier standards for these race categories do not exceed 0.5 percentage points. ‡Data for Mexican Americans are for 1982-84.

**Source:** 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, 2004, with Chartbook on Trends in the Health of Americans. Hyattsville, Maryland: 2004.

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with each additional hour of television viewed per day.<sup>71</sup> The presence of a television in a child's bedroom is a strong predictor that the child will be overweight.<sup>58</sup>

Few studies have explored strategies for reducing children's television viewing. However, school-based programs may help reduce television viewing by providing means for parents and children to monitor and budget the time that children spend watching.<sup>72,73</sup> A recent collaboration between the American Academy of Pediatrics and the TV-Turnoff Network, a national non-profit organization, developed a program to enlist pediatricians in the fight against excessive television watching, providing them with materials to assist patients in controlling time spent watching television at home. In addition, every year the TV-Turnoff Network sponsors TV-Turnoff week in April to encourage families with children to watch less television, promoting healthier lives. For more information, go to [www.tvturnoff.org](http://www.tvturnoff.org).

### Physical Activity

Physical activity plays an important role in children's and adolescents' health and well-being and has important physical, mental, and social benefits.<sup>5,58,64,74</sup> Regular physical activity helps children and young people build and maintain healthy bones, develop coordination, muscles and joints, control body weight, reduce fat, and develop efficient function of the heart and lungs. It also

helps prevent and control feelings of anxiety and depression. In addition, some studies suggest that children who are more physically active show higher academic performance than those who are less active.<sup>74</sup> In 2005, an expert review panel, sponsored by the CDC, recommended that children aged 6 to 18 years should participate daily in 60 or more minutes of moderate to vigorous physical activity that is developmentally appropriate, enjoyable, and involves a variety of activities.<sup>74</sup>

There are no national estimates of physical activity levels among children under age 12 because self-reports in this age group are less reliable than in older children or adolescents.<sup>75</sup> Based on 2003 data, more than half of high school students reported participating in vigorous physical activity (activities eliciting sweat and hard breathing for 20 minutes or more at least 3 times per week), and 20%-25% reported participating in moderate physical activity (less physically intense activities that were performed for 30 minutes or more at least 5 times per week) (Table 1B). Nationally, 57.6% of high school students reported playing on one or more sports teams during 2003, with higher participation rates among males (64.0%) than females (51.0%).<sup>52</sup>

Limited data suggest that physical activity decreases progressively from age 12 to 21.<sup>76</sup> One study reported substantial declines in physical activity levels among

## Body Mass Index for Youth and Adolescents

As children grow and mature, their body composition changes dramatically. The definitions of overweight and obesity are different for youth than for adults. Growth charts showing the entire distribution of height, weight, and body mass index (BMI) were revised in 2000<sup>65</sup> and are available at the CDC's National Center for Health Statistics Web site at [www.cdc.gov/growthcharts](http://www.cdc.gov/growthcharts). These growth charts are the recommended approach to evaluating overweight children and youth and those at risk for becoming overweight, which are defined as follows:

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

white and African-American girls from ages 9-10 to ages 19-20.<sup>77</sup> The decrease was largest among African-American girls. This study also found that smoking initiation in adolescence was associated with the decline in physical activity levels.<sup>77</sup>

National survey data indicate declines in physical activity among children and adolescents over the past decade. In 2003, only 28.4% of high school students attended physical education class daily (Table 1B),<sup>52</sup> down from 41.6% in 1991.<sup>78</sup> A significant portion of this decline happened between 1991 and 1995 (25.4%), with further decline between 1995 and 2003. Varying patterns were seen by different grades: students in the 9th and 10th grades had higher rates of participation in physical education classes daily than 11th and 12th graders (Figure 1F). These differing participation rates may result in part from changes in availability and requirements of school physical education programs. Based on a national survey conducted in 2000, the percentage of schools requiring physical education declined from over 50% in grades 1 to 5, to approximately 25%-30% in grades 6 to 8; 9%-13% in grades 9 to 10; and about 5.5% in grades 11 to 12.<sup>79</sup> Many schools have reduced or eliminated recess and physical education classes to increase time for academic instruction and preparation for standardized testing. However, cutbacks on physical activity to improve academic performance may be counterproductive as recent studies suggest that allocating more class time for physical activity may increase academic performance.<sup>74,80,81</sup>

The potential influence of the physical environment on health has been recognized only recently.<sup>82</sup> Urban sprawl, one aspect of the physical environment, reduces opportunities to walk or bike from home to school, shopping, or other destinations.<sup>83</sup> According to the 2001 National Household Travel Survey, children's walking trips have declined by 60% since 1977; walking and

biking to school have declined by 50% since 1969.<sup>61</sup> A recent study found that fewer than 10% of West Virginian students walked to school and that those who did spent less than 10 minutes walking.<sup>84</sup> In North Carolina, 12.1% of middle school and 6.4% of high school students walked or biked to school at least once a week while only 3.5% of middle school and 1.6% of high school students walked to school 5 times a week.<sup>85</sup> Distance, traffic safety, weather, and fear of crime are leading barriers to walking to and from school.<sup>83,86</sup> Innovative approaches that address these barriers are essential to providing children with opportunities for physical activity in daily life.<sup>87</sup>

For many communities, environmental changes such as increased housing density, walking and bicycle trails, and urban redesign will require long-term planning and investment.<sup>88</sup> Recently, the IOM recommended that local governments, working with developers and community groups, should increase opportunities for physical activity by revising zoning ordinances to increase availability and accessibility of physical activity in new developments, prioritizing capital improvement projects to increase physical activity in existing areas, and building schools where they can be reached without driving by the communities they serve.<sup>64</sup>

Structural changes in the school environment can increase physical activity. For example, a study conducted in San Diego found that children in middle schools with adequate space, facilities, equipment, and supervision were 4 to 5 times more likely to be physically active at school during free time than children in schools with inadequate environments and supervision.<sup>89</sup>

Because of the complexity and importance of these issues, many communities have begun to address the problems that create childhood obesity with the support of federal, state and private, nonprofit and/or for profit organizations (see success stories, page 14).

## Information Resources

Several new initiatives are attempting to consolidate and make available resources to assist individuals, communities, organizations, and politicians in addressing the obesity problem of America's youth.

- SAY (Shaping America's Youth) is a nationwide infrastructure that has begun to identify and centralize information on organizations, agencies, and businesses that address inactivity and obesity among youth. More than 1,800 active programs, representing all 50 states, have registered to be included in the searchable database available at [www.shapingamericasyouth.com](http://www.shapingamericasyouth.com).

**Table 1B. Overweight and Related Factors, High School Students, by State and City, US, 2003**

	% At risk for becoming overweight*	% Overweight†	Rank‡	% Watched three or more hours per day of television§	% Moderate physical activity	% Vigorous physical activity¶	% Attended physical education classes daily	% Played on one or more sports teams#	% Eating five or more fruits and vegetables a day**
<b>United States</b>	<b>14.8</b>	<b>12.1</b>		<b>38.2</b>	<b>24.7</b>	<b>62.6</b>	<b>28.4</b>	<b>57.6</b>	<b>22.0</b>
<b>State</b>	out of 31 states								
Alabama	14.5	13.5	24	41.7	18.6	58.0	33.3	56.3	14.5
Alaska	14.4	11.0	14	27.5	28.2	67.8	18.2	62.8	16.1
Arizona	13.6	10.8	12	36.6	29.2	66.9	23.2	51.7	20.4
Delaware	16.7	13.5	25	45.4	22.6	57.2	28.7	53.4	19.5
Florida	14.0	12.4	19	42.7	22.3	60.8	27.3	51.2	20.7
Georgia	15.1	11.1	15	42.4	25.4	59.0	29.1	53.1	16.8
Idaho	11.3	7.4	3	23.7	29.5	66.4	29.5	58.5	19.0
Indiana	14.2	11.5	17	32.9	26.5	62.3	23.7	57.1	20.3
Kentucky	15.3	14.6	29	30.8	21.3	56.1	23.8	50.9	13.2
Maine	14.6	12.8	22	26.3	24.6	60.6	8.2	56.7	22.6
Massachusetts	13.8	9.9	8	31.3	23.5	61.3	13.7	53.7	N/A
Michigan	15.0	12.4	20	34.8	25.6	62.3	27.5	N/A	18.4
Mississippi	15.7	15.7	31	54.1	18.0	53.3	23.4	54.0	20.4
Missouri	14.9	12.1	18	32.4	28.1	66.6	33.2	51.8	15.0
Montana	11.6	8.1	4	25.3	23.9	62.3	32.6	60.5	16.7
Nebraska	14.7	10.4	10	28.0	26.7	64.7	36.4	62.0	16.3
Nevada	N/A	N/A	N/A	N/A	27.2	66.6	N/A	N/A	N/A
New Hampshire	13.4	9.9	9	26.4	26.1	64.1	N/A	56.9	N/A
New York	15.4	12.9	23	43.6	22.8	64.5	18.5	57.7	24.3
North Carolina	14.7	12.5	21	N/A	22.3	61.2	30.5	N/A	17.8
North Dakota	11.0	9.3	5	21.3	29.0	63.6	37.2	60.8	17.3
Ohio	13.1	13.9	27	32.1	N/A	67.6	31.5	62.6	N/A
Oklahoma	14.2	11.1	16	36.7	25.1	64.3	29.8	55.6	14.3
Rhode Island	14.5	9.8	7	31.9	22.3	62.2	21.1	55.5	28.4
South Dakota	14.5	9.4	6	28.1	26.5	62.2	16.3	64.9	17.1
Tennessee	14.8	15.2	30	44.3	24.0	61.1	28.7	50.7	18.1
Texas††	16.4	13.9	28	44.1	20.2	59.9	29.7	54.0	17.5
Utah	11.3	7.0	1	22.9	29.3	71.1	25.8	62.9	20.3
Vermont	14.1	10.8	13	N/A	26.6	65.4	14.6	N/A	26.5
West Virginia	15.1	13.7	26	33.9	27.4	66.3	28.6	52.7	20.6
Wisconsin	13.7	10.4	11	N/A	28.2	63.4	N/A	61.7	N/A
Wyoming	11.7	7.2	2	26.6	28.3	67.7	23.2	56.3	22.5
<b>City</b>	out of 18 cities								
Boston, MA	18.0	14.2	11	50.0	19.2	50.2	9.2	44.5	N/A
Chicago, IL	17.9	13.9	10	52.5	18.4	46.3	49.9	51.9	17.7
Dallas, TX	19.9	15.9	16	57.5	16.2	54.2	11.2	46.6	16.1
Dekalb County, GA	16.6	12.1	5	55.8	23.2	57.9	25.9	55.8	17.2
Detroit, MI	19.5	19.9	18	65.0	22.4	49.8	28.5	N/A	18.5
Dist. of Columbia	16.8	13.5	8	56.7	15.5	44.4	18.8	45.3	21.3
Ft. Lauderdale, FL	16.0	9.3	1	50.6	20.4	54.7	27.0	46.5	22.5
Los Angeles, CA	17.0	15.8	14	50.4	20.8	58.8	51.0	47.9	19.1
Memphis, TN	18.6	15.8	15	65.5	21.3	53.9	24.0	48.5	14.5
Miami, FL	15.3	12.9	6	53.7	17.1	53.5	13.9	44.1	22.2
Milwaukee, WI	19.3	16.2	17	N/A	23.0	52.3	N/A	51.5	N/A
New Orleans, LA	18.2	13.8	9	64.9	14.9	40.1	22.6	44.5	29.1
New York City, NY	16.2	13.3	7	59.1	22.9	61.0	48.9	45.5	25.9
Orange County, FL	14.2	10.9	3	43.7	22.9	58.2	22.3	48.9	17.9
Palm Beach, FL	14.9	11.2	4	44.2	20.8	57.9	18.8	49.4	23.1
Philadelphia, PA	18.6	15.1	12	59.9	21.2	50.6	24.5	45.1	17.1
San Bernardino, CA	20.6	15.4	13	51.5	22.2	57.3	48.0	49.8	18.9
San Diego, CA	15.7	9.6	2	41.8	27.2	65.8	44.9	52.4	18.7

\*Body mass index at or above the 85th percentile but below the 95th percentile of growth chart for age and sex. †Body mass index at or above the 95th percentile of growth chart for age and sex. ‡Rank is based on % overweight from lowest to highest. §During an average school day. ||Activities that did not make students sweat and breathe hard for 30 minutes or more on 5 or more of the 7 days preceding the survey. ¶Activities that made students sweat and breathe hard for 20 minutes or more on 3 or more of the 7 days preceding the survey. #During the 12 months preceding the survey. \*\*Had eaten 5 or more servings per day of green salad, potatoes (excluding French fries, fried potatoes, or potato chips), carrots or other vegetables, 100% fruit juice, or fruit during the 7 days preceding the survey. ††Survey did not include students from one of the state's largest school districts. N/A = Data not available. **Note:** Data are not available for all states since participation in the Youth Risk Behavior Surveillance System is a voluntary collaboration between a state's departments of health and education.

**Source:** Youth Risk Behavior Surveillance System, 2003, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention. *MMWR Morb Mortal Wkly Rep.* 2004;53(SS-2).

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- Action for Healthy Kids (AFHK) assists schools in finding solutions to improve students' health and readiness to learn through daily physical activity, quality health and physical education, and increased availability of healthy foods and beverages. A report documenting successes in improving school attendance, standardized test scores, and reducing behavior problems can be accessed at [www.actionforhealthykids.org](http://www.actionforhealthykids.org).
- PAY (Physical Activity for Youth Policy Initiative) provides advocates and policy makers with the rationale, recommended policy options, and examples of current programs, legislation, or laws to assist with the integration of physical activity awareness and action in afterschool programs, community programs, community design, and school programs. The document and accompanying policy resource guide can be obtained at [www.nccpa.org/publicaffairspolicy\\_index.asp](http://www.nccpa.org/publicaffairspolicy_index.asp).



### Healthy Eating Patterns

Major changes in the diet of children and adolescents have been documented over the past two decades, including increases in overall energy intake, added sugars, sodium, soft drinks, and fast foods and decreases in the amounts of fruits, vegetables, and milk consumed.<sup>93-95</sup> Snack food consumption has doubled in the last 20 years, and American children are consuming more meals away from home.<sup>94,96</sup> Less than one-fourth (22%) of US high school students ate five or more servings of vegetables and fruits per day in 2003 (Table 1B).

Recommendations made by the US Surgeon General, the IOM, and the American Academy of Pediatrics to improve eating habits among children and adolescents include:<sup>5,58,64</sup>

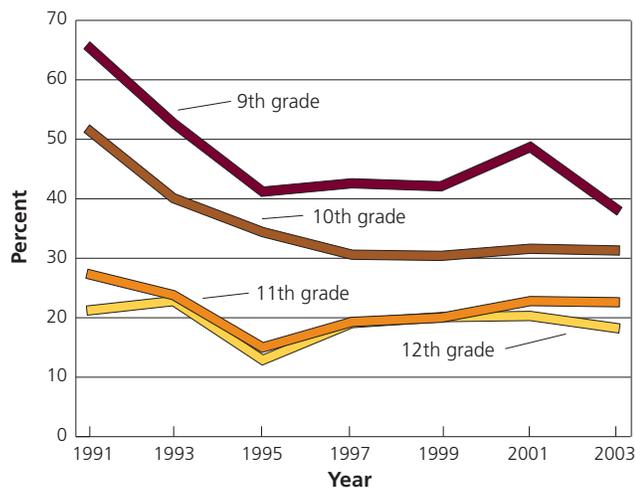
#### 1. Limit children's consumption of fast foods.

Meals eaten away from home are generally less healthy than home-cooked food.<sup>94</sup> Research shows that 30% of children and adolescents consume fast food on a typical day.<sup>97</sup> Fast foods contain more total energy (calories), total fat, and added sugars, as well as more sugar-sweetened beverages, less milk, and fewer fruits and nonstarchy vegetables.<sup>97</sup> Adolescents, regardless of their body weight, tend to overeat by approximately 60% of their estimated total daily energy needs in a single fast-food meal.<sup>98</sup> Unlike their lean counterparts, children who are overweight consume an average 400 excess calories per day. Because regular consumption of fast food may contribute to obesity,<sup>98</sup> parents should limit their children's consumption of these foods and ensure that healthy food choices are available and accessible at home for meals and snacks.<sup>99</sup>

#### 2. Promote healthier food choices in school cafeterias.

The school environment has a large impact on adolescents' food choices, because 35% to 40% of daily energy intake is consumed at school.<sup>100</sup> In most schools, the nutrition program has two components: the US Department of Agriculture (USDA) school meals programs (including both breakfast and lunch meals) and the sale of "competitive foods." In 2002, 28 million children participated in the National School Lunch Program and another 8 million participated in the School Breakfast Program.<sup>101,102</sup> USDA analyses show that participants in the National School Lunch Program consume less sugar, soda, and sweetened fruit drinks and consume more milk and vegetables than do non-participants.<sup>103</sup> Six states (AR, KY, SC, SD, TN, TX) have implemented even stricter nutritional standards for school lunches, breakfasts, and snacks than the US Department of Agriculture requirements.<sup>104</sup>

**Figure 1F. Physical Education Class Attendance\*, High School Students, by Grade, US, 1991-2003**



\*Attended PE class daily on 5 days in an average week when in school.

Source: Youth Risk Behavioral Surveillance System, 1991-2003, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention. *MMWR Morb Mortal Wkly Rep.* 2004;53(36):844-847.

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## Success Stories

### Safe Routes to School

At least 18 states and several local governments have funded and implemented *Safe Routes to School* (SR2S) Programs intended to identify and remove barriers to walking or bicycling to school. Funded projects range from construction projects that modify the built environment (sidewalks, pedestrian crossing improvements, bicycle paths) to traffic signals designed to enforce safety. An effectiveness study of the California SR2S program showed that children who passed by SR2S-funded construction projects on their usual school route were more likely to increase walking or bicycling to school than were children who did not.<sup>90</sup> An evaluation study of an SR2S program in Marin County, CA, which included safety improvements as well as education, showed a 64% increase in the number of children walking to school, and a 114% increase in the number of children bicycling to school by the second year of the program.<sup>91</sup> More information about the SR2S program is available at <http://www.nhtsa.dot.gov/> and <http://www.saferoutestoschools.org/>.

### CDC's KidsWalk-to-School

A CDC program, called KidsWalk-to-School, also aims to increase opportunities for daily physical activity by encouraging children to walk to and from school in groups accompanied by adults. The online guide (available at [www.cdc.gov/nccdphp/dnpa/kidswalk](http://www.cdc.gov/nccdphp/dnpa/kidswalk)) provides step-by-step details on how to organize a KidsWalk-to-School Program, including safety information and a list of resources to assist with program development.

### CDC's VERB™ Campaign

VERB™, a 5-year media campaign initiated by the CDC in October 2002, promotes physical activity through media messages, partnership, and community efforts. VERB advertisements aimed at children portray physical activity as being “cool,” fun, and socially appealing, while advertisements aimed at parents encourage them to engage in physical activity with their children and suggest ways to overcome perceived barriers to physical activity. This campaign also addresses other important environmental factors, such as access to safe and affordable opportunities for both leisure-time and organized physical activities. The outcomes of this media campaign are being measured by the Youth Media Campaign Longitudinal

Survey, a telephone survey of children aged 9 to 13 and their parents. A one-year evaluation of the VERB campaign showed that 74% of children aged 9 to 13 were aware of the campaign, and 90% of those who were aware understood the message.<sup>92</sup> Levels of free-time physical activity increased with increasing levels of awareness among the entire target population of 9-13-year-olds. Younger children and girls who were aware of the campaign engaged in 34% and 27% more free-time physical activity per week, respectively, than did those who were unaware of the campaign.<sup>92</sup>

While these results are encouraging, continued awareness and increased participation rates in both free-time and organized physical activities are needed to curb the youth obesity epidemic. Information about the VERB campaign is available at [www.cdc.gov/verb](http://www.cdc.gov/verb).

### Michigan Schools Get Healthy

The Great Lakes Division of the American Cancer Society and the Michigan Department of Education and Community Health have teamed up to help create healthier schools throughout the state. Grants provided to schools as part of this collaborative effort have allowed schools to make changes that encourage students to eat healthy foods and be more active. Changes made by funded schools include improving school meals by making available more fresh fruits and vegetables and less high-sugar foods, enhancing nutrition education within the school curriculum, increasing time for physical education, and scheduling time for exercise and active games in classrooms. Of the funded schools, 90% report an increased awareness about the importance of offering healthy choices, 61% say that school meals have improved, and 55% report the students having more nutrition education as part of the curriculum. Of funded schools, 95% were able to maintain or expand changes begun with the original grants, focusing on increasing opportunities for activity, especially walking clubs, improving the nutritional quality of foods available in school meals, making healthier vending options available, and providing classroom nutrition education. More information about creating healthier school environments is available at [www.mihealthtools.org](http://www.mihealthtools.org).

Competitive foods are sold à la carte in cafeterias, vending machines, school stores, fundraisers, or provided as snacks in classrooms. While the meals provided through the National School Lunch Program and the School Breakfast Program are required to provide no more than 30% of calories from fat and 10% of calories from saturated fat, no such limitations are placed on competitive foods. These foods are high in fat, salt, and added sugar, and are not only popular among adolescents, they also generate substantial revenue for schools.<sup>105</sup> Students also have access to vending machines and/or snack bars in 43% of elementary schools, 74% of middle schools, and 98% of high schools.<sup>35</sup>

Since competitive foods are not part of the school meals programs, state and local school systems must develop and implement stricter nutritional standards for such foods. Only 11 states (AZ, CA, HI, KY, MD, NM, OK, SC, TN, TX, and WV) have set nutritional standards for these foods.<sup>104</sup> Because students consume so many of their calories from competitive foods available at school, it has been recommended that the USDA, with independent scientific advice, should establish nutritional standards for all food and beverage items served or sold in schools.<sup>106</sup>

**3. Decrease availability and consumption of sugar-sweetened beverages, including soft drinks.**



Between 56% and 85% of school-age children consume at least one nondiet soft drink daily, adding calories with no nutritive value to their diet.<sup>107</sup> A 2004 study of adolescents found that soda consumption was significantly related to BMI, and not surprisingly, an earlier study showed that soft drinks contribute a high proportion of total calorie intake among overweight children.<sup>108,109</sup> A 19-month follow-up study of Massachusetts school children found significant increases in both BMI and obesity for each additional daily serving of a sugar-sweetened drink.<sup>110</sup> A targeted, school-based educational intervention that reduced the number of carbonated drinks consumed also reduced the prevalence of overweight and obesity among the participating children.<sup>111</sup>

Among secondary schools across 27 states, soft drinks, sports drinks, or fruit drinks not 100% juice were more readily available than any other food or beverage.<sup>112</sup> The American Academy of Pediatrics recommended in 2004 that school districts consider restricting the sale of soft drinks to children, saying nutritious alternatives such as water, real fruit juice, and low-fat milk could be sold in place of soft drinks to help maintain school revenues.<sup>107</sup>

#### **4. Limit and monitor food and beverage advertising to children.**

Students in grades 7-12 who frequently eat fast food tend to watch more television than other students,<sup>113</sup> and middle-school children who watch more television tend to consume more soft drinks.<sup>114</sup> A factor that may explain these associations is increased exposure to youth-directed food advertising among children who watch more television. Almost one-third of the advertisements directed at youth during Saturday morning children's television programming were for foods high in fats and sugar such as candy, soft drinks, chips, cookies, fast foods, and high-sugar breakfast cereals. The estimated exposure to food advertising during Saturday morning television is one commercial every 5 minutes.<sup>115</sup> The IOM has recommended that national guidelines be developed for food and beverage advertising and marketing to children. These guidelines would be implemented by

## **Success Stories**

### **USDA's Fruit and Vegetable Pilot Program (FVPP)**

The USDA (a partner of the 5 A Day for Better Health Program) created the FVPP through a \$6 million grant from the 2002 Farm Act to provide fresh and dried fruits and vegetables free to children in 107 elementary and secondary schools in four states as well as in one tribal organization for the 2002-2003 school year. Schools participating in a one-year pilot program reported that 80% of students were very interested in the program and that more than 90% of fruit and vegetable offerings were consumed. One-third of the schools reported that the program increased the likelihood of student participation in the school meal program, and almost 80% of schools reported that the program increased the acceptance of fruit and vegetables offered as part of school meals. The fiscal year 2006 Agricultural Appropriations bill approved by the Senate includes \$6 million in funding for the program and has expanded it to include a total of 14 funded states. For more information about this and other 5 A Day for Better Health programs, see the adult section on Fruit and Vegetable Consumption or visit [www.5aday.gov](http://www.5aday.gov).

### **Texas School Nutrition Policy**

In March 2004, the Texas Department of Agriculture (TDA) issued the Texas School Nutrition Policy establishing Texas as a leader in school nutrition. This statewide policy applies to all public schools participating in the federal child nutrition programs (National School Lunch Program, School Breakfast Program, and the After-School Snack Program), and it established strong regulations on Foods of Minimal Nutrition Value (FMNV), competitive foods, nutritional standards for fats and fried foods, portion sizes, types and frequency some foods can be offered, and beverage contracts. More information about the Texas School Nutrition Policy is available at [http://www.squaremeals.org/fn/render/parent/channel/0,1253,2348\\_2350\\_0\\_0,00.html](http://www.squaremeals.org/fn/render/parent/channel/0,1253,2348_2350_0_0,00.html).

### **Florida – Eat Your Colors Every Day**

This school-based pilot program, initiated in 2002 through a grant from the Florida Department of Agriculture and Consumer Services, has continued to expand throughout Florida and into other states as well (KS, OR, and SC in 2003-2004). The program is designed to increase student consumption of fresh fruit and vegetables by implementing, enhancing, and expanding salad bars, salad options, and nutrition education activities in elementary, middle, and high schools. Evaluations of the pilot programs found an increase in student fruit and vegetable consumption of 10.3% at school and a positive correlation between the level and intensity of programming activities and fruit and vegetable servings. More information can be obtained at [www.5aday.com/html/industry/floridastats.php.a](http://www.5aday.com/html/industry/floridastats.php.a)

industry and monitored by the Federal Trade Commission.<sup>64</sup>

## **Sun Protection**

The vast majority of skin cancers are due to unprotected and excessive exposure to ultraviolet (UV) radiation. While UV exposure is associated with a small percentage of all cancer deaths,<sup>116</sup> the American Cancer Society esti-

mates that UV exposure is associated with more than one million cases of basal and squamous cell cancers and 62,190 cases of malignant melanoma in 2006.<sup>1</sup> Artificial sources, such as tanning booths, add to this exposure. The short-term adverse effects of UV exposure are sunburn and tanning; long-term effects include prematurely aged skin, wrinkles, and skin cancer. Although very dark skinned individuals have a decreased risk of melanoma, they can still develop this cancer, especially on the hands, soles of the feet, and under the nails.

Regular practice of sun protection behaviors can lead to significant reductions in UV exposure and risk of skin cancer (see sidebar to the right). Sunburn during childhood and intense intermittent sun exposure increases the risk of melanoma and other skin cancers later in life.<sup>117-119</sup> Because much exposure to sunlight occurs during childhood or adolescence, protection behaviors should begin early in life. A CDC study revealed, however, that 25% of parents did not require their children, aged 12 or younger, to protect themselves, and the proportion of children who used one or more protective behaviors decreased with age.<sup>120</sup>

Adolescence is a period of heightened unprotected sun exposure.<sup>121</sup> An American Cancer Society study showed that less than one-third of youth aged 11 to 18 used any type of sun protection measures.<sup>122</sup> The Youth Risk Behavior Surveillance System found that only 14.2% of public and private high school students used sunscreen with a SPF of 15 or higher “most of the time” or “always” when they were outdoors in the sun for more than an hour.<sup>123</sup> In another study, almost three-quarters (72%) of youth reported getting sunburned during the summer months. Of those, fewer than 40% reported they were

### Success Story

The *Pool Cool Program*, a multi-component skin cancer prevention program funded by the CDC, was designed to educate youngsters about the importance of sun protection habits while at the pool. Parents and recreation pool staff acted as social role models to facilitate children’s adoption of sun protection habits. The program also provided sunscreen and promoted sun-safe environments through the enhancement of shaded areas at the pool. In a recent evaluation of the program, conducted in Hawaii and Massachusetts, results showed that when compared to control sites, children who participated in the intervention program were more likely to adopt sun protection behaviors (i.e., to regularly apply sunscreen, wear protective clothing or sunglasses, and stay in the shade).<sup>129</sup> In 2003, the National Cancer Institute funded a trial to expand the use of the *Pool Cool Program* model in various communities in the mainland US; future evaluations will determine whether it can be successfully implemented and maintained in other communities.<sup>130</sup> Dissemination, adoption, and successful maintenance of effective educational programs in community settings is crucial for achieving the public health benefits of skin cancer prevention and disease reduction in the future.

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

### Risk factors for melanoma<sup>128</sup>

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

### Risk factors for basal and squamous cell cancers<sup>128</sup>

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

### Measures to prevent skin cancer

- Avoid direct exposure to the sun between the hours of 10 a.m. to 4 p.m., when ultraviolet rays are the most intense.
- Wear hats with a brim wide enough to shade face, ears, and neck, as well as clothing that 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 tanning beds and sun lamps, which provide an additional source of UV radiation.

using sunscreen lotion of SPF-15 or higher when they got burned.<sup>124</sup> It is important that adolescents learn about proper application and re-application intervals for sunscreen.<sup>125,126</sup>

To improve sun protection practices among children and adolescents, the CDC recommends developing comprehensive programs that include school intervention components.<sup>127</sup> However, current data from the CDC School Health Policies and Programs Study indicate that 35 states have no policies for sun safety programs in elementary, junior/middle, or senior high schools. In states where UV exposure is high year-round, parents should work with schools to develop sun protection programs at all grade levels and establish proper sun protection practices for their own children. Established statewide skin cancer prevention programs can provide useful resources to parents, schools, and child care organizations to protect children from excessive skin exposure that can cause melanoma and other skin cancers.

# Adult Cancer Prevention

## Tobacco Use

Tobacco use is the single largest preventable cause of disease and premature death in the United States. Each year, smoking accounts for an estimated 438,000 premature deaths; 38,000 deaths in nonsmokers as a result of exposure to secondhand smoke; and \$167 billion in health care expenditures and productivity losses.<sup>131</sup> Tobacco use increases the risk of cancer of the lung, mouth, nasal cavities, larynx, pharynx, esophagus, stomach, liver, pancreas, kidney, bladder, uterine cervix, and myeloid leukemia.<sup>132</sup> Exposure to secondhand smoke increases the risk of lung cancer.<sup>133</sup> Thirty percent of cancer deaths, including 87% of lung cancer deaths, can be attributed to tobacco<sup>2,132,133</sup> (Figure 2A).

Both cigarette consumption and the prevalence of smoking in the United States have declined since the release of the first US Surgeon General's Report on Smoking and Health in 1964, although recent decreases have been greater for tobacco consumption than for smoking prevalence.<sup>134</sup> Per-capita cigarette consumption is currently lower than at any point since the start of World War II. Nonetheless, an estimated 23.4% of men

and 18.5% of women still smoke cigarettes, with approximately 81.3% smoking daily.<sup>135</sup>

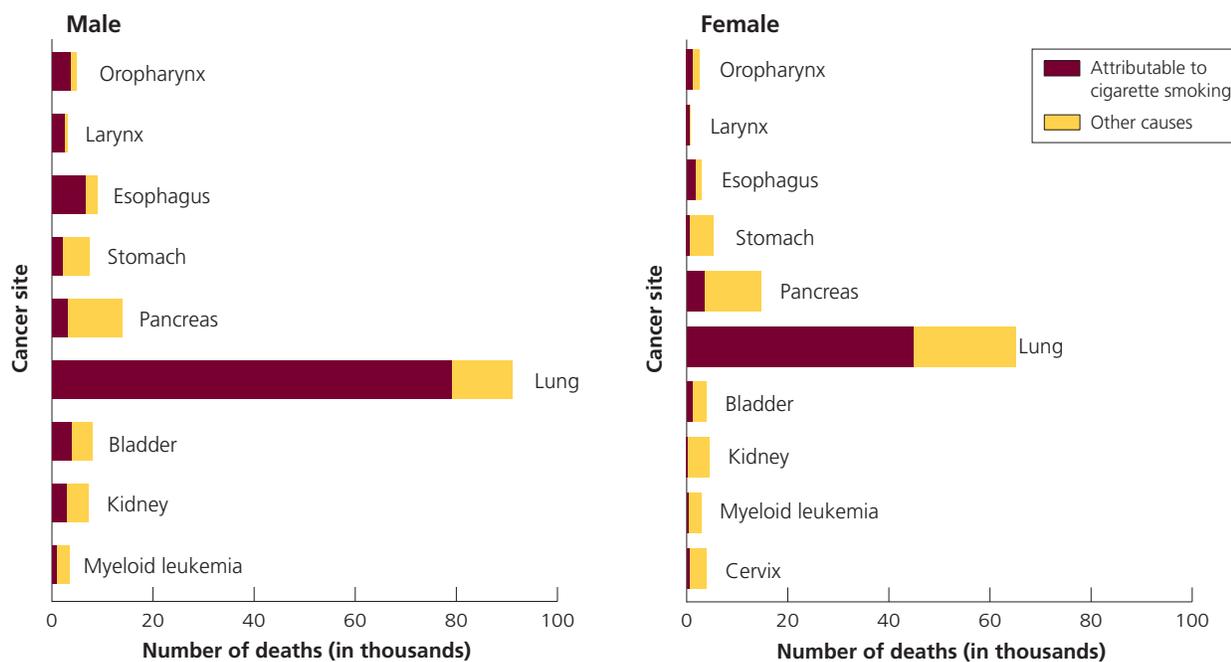
Smoking prevalence varies by level of education, although this relationship has reversed over time. In the early 1960s, college-educated adults had the highest smoking prevalence. By 2003, only 12.3% of college graduates were current smokers, compared to 26.6% of those who did not graduate from high school (Figure 2B). Smoking prevalence is higher among men than women, and varies by race, ethnicity, and socioeconomic status (Table 2A). The prevalence of smoking is highest among American Indian/Alaska Native men and women, and lowest among Asian American men and women<sup>135</sup> (Table 2A). Across the states, smoking prevalence ranges from 10.5% in Utah to 27.6% in Kentucky (Table 2B).

## Comprehensive Tobacco Control Programs

Further reductions in tobacco use will require implementation of economic, policy, and regulatory interventions that reduce tobacco use and protect nonsmokers from secondhand smoke.<sup>4</sup> The goals of comprehensive tobacco control are to:<sup>4</sup>

- Prevent the initiation of tobacco use among young people.

**Figure 2A. Annual Number of Cancer Deaths Attributable to Smoking, Males and Females, by Site, US, 1997-2001**



Source: Centers for Disease Control and Prevention. Annual smoking-attributable mortality, years of potential life lost, and productivity losses – United States, 1997-2001. *MMWR Morb Mortal Wkly Rep.* 2005;54(25):625-628.

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- 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.
- Facilitate smoking cessation.

Best practices for state tobacco control programs have been published by the CDC, which recommends that such programs be comprehensive, sustainable, and accountable.<sup>32</sup> Effective state-based programs include the following components: community and school programs and policies; smoke-free policies; counter-marketing campaigns (such as antismoking ads); and cessation programs and policies (such as smoking cessation telephone counseling and benefits coverage for tobacco cessation therapies).<sup>32</sup> Evidence for these recommendations stems in part from efficacy studies in states that have implemented such programs (including California, Massachusetts, Oregon, Maine, Florida, Minnesota, and Mississippi).<sup>4</sup> These studies document the beneficial impact of comprehensive tobacco control programs in reducing tobacco use and consumption.<sup>136-145</sup> In a study of the California Tobacco Control Program (CTCP), begun in 1990, analyses of lung cancer incidence in California between 1975 and 1999 found that there was a significantly greater rate of decline in lung cancer

**Table 2A. Current Cigarette Use\*, Adults 18 and Older, US, 2004**

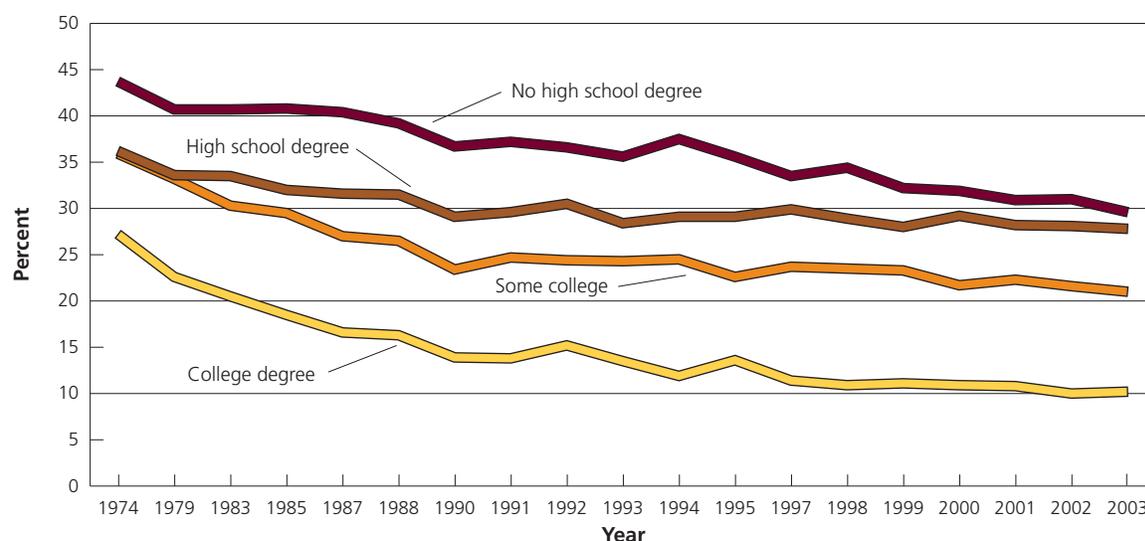
Characteristic	% Men	% Women	% Total
<b>Age group (years)</b>			
18 to 24	25.6	21.5	23.6
25 to 44	26.3	21.4	23.8
45 to 64	25.0	19.8	22.4
65 or older	9.8	8.1	8.8
<b>Race/ethnicity</b>			
White (non-Hispanic)	24.1	20.4	22.2
African American (non-Hispanic)	23.9	17.2	20.2
Hispanic/Latino	19.8	10.9	15.0
American Indian/Alaskan Native <sup>†</sup>	37.3	28.5	33.4
Asian <sup>‡</sup>	17.8	4.8	11.3
<b>Education (years)<sup>§</sup></b>			
8 or fewer	23.5	10.5	16.7
9 to 11	38.3	29.8	34.0
12	27.2	21.1	24.0
13 to 15	24.6	20.3	22.2
16	13.5	10.1	11.7
more than 16	7.9	8.1	8.0
<b>Total</b>	<b>23.4</b>	<b>18.5</b>	<b>20.9</b>

\*Persons who reported having smoked at least 100 cigarettes or more and who reported now smoking every day and 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.

**Source:** National Health Interview Survey, 2004, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention. Cigarette smoking among adults – United States, 2004. *MMWR Morb Mortal Wkly Rep.* 2005;54(44):1121-1124.

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**Figure 2B. Current\* Cigarette Smoking by Education,† Adults 25 and Older, US, 1974-2003**



\*Adults 25 and older who have ever smoked 100 cigarettes in their lifetime and who are current smokers (regular and irregular). †Estimates are age-adjusted to the 2000 US standard population using four age groups: 25-44 years, 45-64 years, 65-74 years, and 75 years and over.

**Source:** 1974-2002: National Center for Health Statistics, Health, United States, 2004. With Chartbook on Trends in the Health of Americans. Hyattsville, Maryland: 2004. 2003: Lethbridge, Çejku M, Vickerie J. summary health statistics for US adults: National Health Interview Survey, 2003. National Center for Health Statistics. *Vital Health Stat* 10(225). 2005.

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

	Cigarette Smoking*					Fiscal year 2001 per capita tobacco control funding (\$)	Fiscal year 2006 per capita tobacco control funding (\$)	Difference in per capita tobacco control funding (2001-2006)	Cigarette tax per pack (\$) <sup>§</sup>
	% 18 and older	State Rank <sup>†</sup>	% Men 18 and older	% Women 18 and older	% Low education <sup>‡</sup>				
Alabama	24.9	42	29.0	21.2	34.6	1.35	0.07	-1.28	0.425
Alaska	24.9	43	26.4	23.3	41.9	2.23	9.09	6.86	1.60 <sup>¶</sup>
Arizona	18.6	6	19.7	17.6	19.1	6.72	4.50	-2.22	1.18 <sup>¶</sup>
Arkansas	25.7	45	28.1	23.4	33.1	6.02	6.55	0.53	0.59
California	14.8	2	18.5	11.1	15.2	3.38	2.35	-1.03	0.87
Colorado	20.1	15	22.3	17.8	35.1	2.95	6.28	3.33	0.84
Connecticut	18.1	4	20.1	16.2	28.2	0.29	0.01	-0.28	1.51 <sup>¶</sup>
Delaware	24.5	39	28.4	20.9	36.6	3.57	11.74	8.17	0.55
Dist. of Columbia	21.0	26	25.1	17.3	27.2	0.00	0.00	0.00	1.00 <sup>¶</sup>
Florida	20.4	20	23.3	17.7	30.1	2.75	0.06	-2.69	0.339
Georgia	20.1	16	22.4	17.9	30.7	1.93	0.38	-1.55	0.37
Hawaii	#	#	#	#	#	7.68	4.79	-2.89	1.40 <sup>¶</sup>
Idaho	17.5	3	19.2	15.7	38.0	0.93	0.42	-0.51	0.57
Illinois	22.2	32	26.1	18.6	31.1	2.30	0.89	-1.41	0.98
Indiana	25.0	44	26.8	23.2	39.5	5.76	1.78	-3.98	0.555
Iowa	20.8	24	22.8	19.0	32.6	3.21	1.91	-1.30	0.36
Kansas	19.8	10	22.1	17.6	28.7	0.19	0.37	0.18	0.79
Kentucky	27.6	50	29.3	25.9	37.4	1.44	0.67	-0.77	0.30
Louisiana	23.6	37	26.9	20.5	31.1	0.92	1.79	0.87	0.36
Maine	21.0	27	22.6	19.5	33.5	14.75	11.14	-3.61	2.00 <sup>¶</sup>
Maryland	19.7	9	22.7	16.9	34.4	5.66	1.74	-3.92	1.00
Massachusetts	18.5	5	19.7	17.4	25.9	6.79	0.68	-6.11	1.51 <sup>¶</sup>
Michigan	23.4	36	25.0	21.8	33.5	0.00	0.00	0.00	2.00 <sup>¶</sup>
Minnesota	20.7	23	22.0	19.5	26.6	7.11	4.49	-2.62	1.23 <sup>¶</sup>
Mississippi	24.6	41	29.1	20.5	34.2	10.90	7.03	-3.87	0.18
Missouri	24.1	38	26.1	22.3	38.2	0.00	0.00	0.00	0.17
Montana	20.4	21	20.6	20.2	27.5	3.88	7.54	3.66	1.70 <sup>¶</sup>
Nebraska	20.3	18	23.1	17.7	24.5	4.09	1.75	-2.34	0.64
Nevada	23.2	34	24.7	21.7	32.1	1.50	2.10	0.60	0.80
New Hampshire	21.8	30	24.0	19.7	43.1	2.43	0.00	-2.43	0.80
New Jersey	18.9	7	20.1	17.8	22.5	3.57	1.37	-2.20	2.40 <sup>¶</sup>
New Mexico	20.3	17	22.8	17.9	31.4	1.26	3.30	2.04	0.91
New York	20.0	14	21.2	19.0	27.1	1.58	2.29	0.71	1.50 <sup>¶</sup>
North Carolina	23.2	35	26.6	20.0	30.2	0.00	1.86	1.86	0.30
North Dakota	19.9	11	24.1	15.8	17.6	0.00	4.83	4.83	0.44
Ohio	25.9	46	27.3	24.7	44.3	5.28	4.16	-1.12	1.25 <sup>¶</sup>
Oklahoma	26.1	47	28.1	24.2	36.2	1.83	2.58	0.75	1.03 <sup>¶</sup>
Oregon	20.0	13	21.9	18.2	27.3	2.48	1.02	-1.46	1.18 <sup>¶</sup>
Pennsylvania	22.7	33	23.0	22.5	36.6	0.00	2.68	2.68	1.35 <sup>¶</sup>
Rhode Island	21.3	28	23.7	19.2	24.1	2.19	2.00	-0.19	2.46 <sup>¶</sup>
South Carolina	24.5	40	28.1	21.2	36.6	0.45	0.00	-0.45	0.07
South Dakota	20.3	19	22.0	18.7	27.0	2.25	0.94	-1.31	0.53
Tennessee	26.1	48	27.1	25.3	40.9	0.00	0.00	0.00	0.20
Texas	20.6	22	23.7	17.5	22.4	0.45	0.34	-0.11	0.41
Utah	10.5	1	11.7	9.4	23.1	2.69	3.22	0.53	0.695
Vermont	20.0	12	21.8	18.3	36.4	10.68	8.05	-2.63	1.19 <sup>¶</sup>
Virginia	20.9	25	22.4	19.5	28.8	1.78	1.81	0.03	0.30
Washington	19.2	8	20.1	18.3	28.9	2.54	4.61	2.07	2.025 <sup>¶</sup>
West Virginia	26.9	49	27.4	26.4	34.5	3.26	3.26	0.00	0.55
Wisconsin	22.0	31	25.0	19.1	29.6	3.95	1.86	-2.09	0.77
Wyoming	21.7	29	21.6	21.9	37.2	1.82	11.95	10.13	0.60
United States**	20.9		23.2	18.7	27.7	3.11	2.99	-0.13	0.92
Range	10.5-27.6		11.7-29.3	9.4-26.4	15.2-44.3	0.0-14.75	0.0-11.95	-6.11-10.13	0.07-2.46

\*Adults 18 and older who have smoked 100 cigarettes 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. §Taxes reported as of September 2005. ¶Taxes more than 1 dollar. #Estimate not available as state did not participate in the 2004 survey. \*\*See Statistical Notes for definition of prevalence measures; average value (including District of Columbia) for taxes and per capita funding.

**Source:** Cigarette smoking percentages: Behavioral Risk Factor Surveillance System Public Use Data Tape 2004, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2005. Per Capita Funding: calculated by dividing state prevention funding (Campaign for Tobacco-Free Kids, et al. A Broken Promise to Our Children: the 1998 Master Settlement Agreement Seven Years Later. National Center for Tobacco-Free Kids, 2005.) by 2000 US Census state population counts (<http://www.census.gov>). Cigarette Taxes: National Government Relations Department, American Cancer Society, 2005.

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## Success Stories

On September 1, 2005, **North Carolina**, home of R.J. Reynolds Tobacco Company, increased its cigarette tax sixfold from 5 to 30 cents per pack. Additionally, tax on other tobacco products increased from 2% of the cost of the product to 3%. The legislation also includes an additional cigarette tax increase of 5 cents that will be effective July 1, 2006. The additional tobacco tax funds will go into the general fund.<sup>149</sup>

**Kentucky**, the second largest producer of tobacco leaf in the nation,<sup>150</sup> passed legislation to increase its state excise tax on cigarettes by 27 cents (from 3 cents to 30 cents) in 2005.<sup>151</sup> With this legislation, Kentucky no longer has the lowest tobacco excise tax in the US. One cent of this tax increase has been earmarked for the Cancer Research Fund and will be split between the University of Kentucky and the University of Louisville.<sup>151</sup>

**New Mexico** is reaping the benefits of a comprehensive approach to tobacco control, which has included community-based programs, tax increases, and smoke-free legislation. In the last five years, adult smoking prevalence in the state has decreased from 23.6% in 2000 to 20.3% in 2004.<sup>152</sup> In both 2003 and 2004, the state's Tobacco Use Prevention and Control (TUPAC) Program received \$5 million from the Master Settlement Agreement as well as an additional \$1.1 million federal grant from the CDC.

New Mexico's comprehensive approach to tobacco control includes:

- Community and school programs, youth initiatives, tobacco cessation, educational and media campaigns, surveillance, and evaluation activities.<sup>153</sup>
- A state quitline that has served over 5,000 callers since 2001 and updated quitline services that now includes customized quit plans and counseling, referrals to local cessation programs, and expanded bilingual services.<sup>152</sup>
- A cigarette excise tax increase in 2003 of 70 cents (from 21 to 91 cents). Of the revenue generated, 14.52% goes to the University of New Mexico Health Sciences Center and 1.36% goes to the University's Cancer Research and Treatment Center.<sup>154</sup>
- Smoke-free legislation at the local level. Currently, 42% of New Mexicans are protected from secondhand smoke in public places and/or worksites.<sup>152</sup>

Further information about the New Mexico Tobacco Use Prevention and Control Program can be found at <http://www.health.state.nm.us/tobacco.html>.

from 1988 to 1999 than would have been predicted from prior lung cancer trends in the state. This decline was also much greater than declines in lung cancer incidence trends (if any) in other areas, measured by SEER.<sup>145</sup> The CTCPC has estimated that for every dollar spent on tobacco control between 1990 and 1998, more than \$3 was saved in direct medical costs.<sup>146</sup>

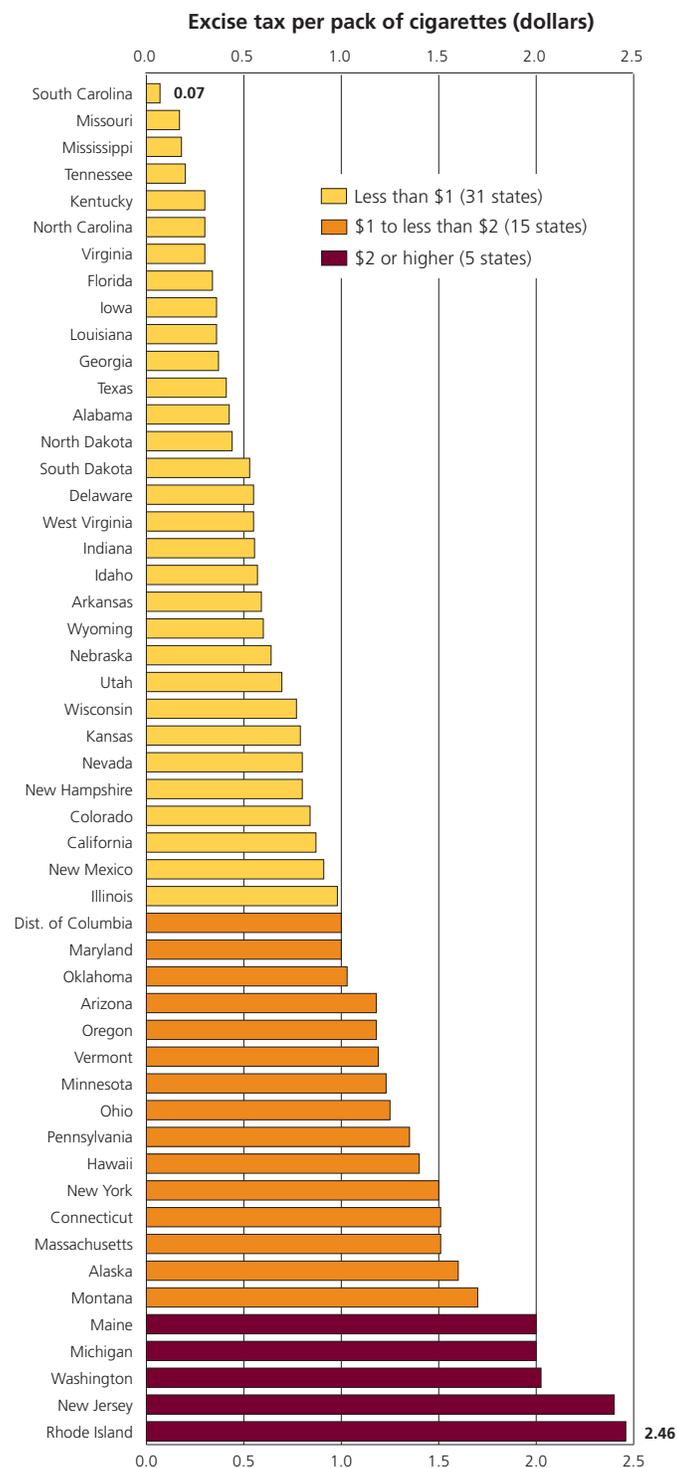
**Tobacco excise taxes.** Excise taxes on tobacco serve the dual purpose of reducing tobacco consumption, especially among children, and of raising revenues for tobacco control.<sup>4</sup> The price of cigarettes is inversely and predictably related to consumption: among adults, a 10% increase in price reduces overall cigarette consumption by 3-5%.<sup>4</sup> To generate funds for tobacco control and reduce smoking initiation among adolescents, the American Cancer Society has joined with other leading health organizations to issue the Tobacco Tax Challenge that encourages governors to enact an above-average sales tax on cigarettes.<sup>4,147</sup> Cigarette taxes can be levied at the federal, state, local, and municipal levels. Currently, the federal tax is 39 cents per pack in all states, but there is wide variation in state cigarette excise taxes levied, ranging from 7 cents per pack in South Carolina to \$2.46 per pack in Rhode Island (Figure 2C, Table 2B). Currently, 31 states have a state excise less than \$1 per pack of cigarettes, while 15 states have excise taxes of less than

55 cents. These low taxing states are mostly concentrated in the Southeast and Central US, and include several tobacco growing states (see cover, Table 2B). Although 41 states increased their cigarette taxes during the past four years, only 19 states have laws requiring that a portion of their excise tax be dedicated to tobacco control or cancer programs.<sup>148</sup>

**Smoke-free initiatives.** Smoke-free initiatives to reduce secondhand smoke (also referred to as clean air laws or ordinances) are another important component of comprehensive tobacco control. Such laws ban smoking in workplaces, bars, and/or restaurants, and help protect nonsmokers from secondhand smoke, change social norms about smoking, and motivate addicted smokers to quit or reduce their consumption. Recent data indicate that exposure of the general US population to secondhand smoke has been reduced. Between 1988-1991 and 1999-2002, the median levels of cotinine (a metabolite of nicotine considered to be the best biomarker for measurement of secondhand smoke exposure) among nonsmokers declined by 68% in children, 69% in adolescents, and about 75% in adult nonsmokers.<sup>155</sup>

Smoke-free initiatives exist at federal, state, and local levels.<sup>4</sup>

**Figure 2C. Cigarette Excise Tax, by State, US, 2005**



Source: National Conferences of State Legislatures (NCSL) & Federation of Tax Administrators. Provided by National Government Relations Department, American Cancer Society, 2005.

American Cancer Society, Surveillance Research

- More than 2,129 municipalities have passed some form of smoke-free legislation.<sup>156</sup> Currently, 124 municipalities in the country have passed laws to establish 100% smoke-free workplaces, restaurants, and bars.<sup>157</sup> Figure 2D shows cumulative increasing trends in municipalities with 100% smoke-free laws between 1990 and 2005.
- Fifteen states (CA, CT, DE, FL, ID, MA, ME, MT, ND, NY, RI, SD, UT, VT, WA) have also implemented statewide smoking bans that prohibit smoking in workplaces and/or restaurants and/or bars.<sup>156</sup> Delaware, Massachusetts, New York, Rhode Island, and Washington are the only states that provide comprehensive smoke-free protection, meaning that all workplaces, restaurants, and bars are 100% smoke-free (Figure 2E).<sup>156</sup>
- Currently, 39.4% of the US population is covered by a 100% smoke-free provision in the workplace and/or restaurants and/or bars.<sup>156</sup>

The American Cancer Society, through its advocacy and public awareness efforts, is leading the charge to pass smoke-free legislation at the community and state levels so that all Americans have the right to work or dine where they choose without compromising their health.

**Economic impact of smoke-free laws.** There have been numerous studies of the economic impact of smoke-free legislation on restaurants, bars, and other components of the hospitality industry.<sup>158</sup> Most of these studies show either no adverse effect or a positive effect on the business, despite the claims of the tobacco industry.

The gaming industry, including most tribally owned casinos and bars, is increasingly the only portion of the hospitality industry still being exempted from smoke-free laws. However, a recent study in Delaware found that their comprehensive statewide smoke-free law had no effect on revenue from the gaming industry.<sup>159</sup> Additionally, in Massachusetts, charitable bingo has not been negatively affected by smoke-free ordinances.<sup>160</sup>

**Health impact of smoke-free laws.** Several studies have documented a positive health effect of smoke-free ordinances, which have been associated with decreases in heart attacks, colds, sinus infections,<sup>167,168</sup> and respiratory symptoms among restaurant and bar workers.<sup>169</sup> Additionally, a decrease of 80%-90% of fine particulate matter has been measured in the air of restaurants and bars following implementation of smoke-free ordinances.<sup>166,170</sup>

The evidence is clear: smoke-free laws protect the health of employees and consumers and are not harmful to workplace, restaurant, bar, bingo, or gaming businesses.

**Counter-advertising.** Comprehensive tobacco control programs use various strategies to counteract the more than \$15 billion spent by tobacco companies on advertising and promotion.<sup>4,26</sup> Counter-advertising uses media advocacy and paid advertisements to discourage tobacco use and expose the industry's marketing and promotional tactics. Considerable research has been done on how to design effective counter-advertising and health education campaigns on tobacco.<sup>4</sup> Mass media campaigns are the most visible component of tobacco control programs in California, Massachusetts, Arizona, Florida, and Minnesota. In California, the statewide media campaign promotes core messages (e.g., 'the tobacco industry lies,' 'secondhand smoke kills,' and 'nicotine is addictive') to foster a social and legal climate in which tobacco use is recognized as undesirable.<sup>146</sup>

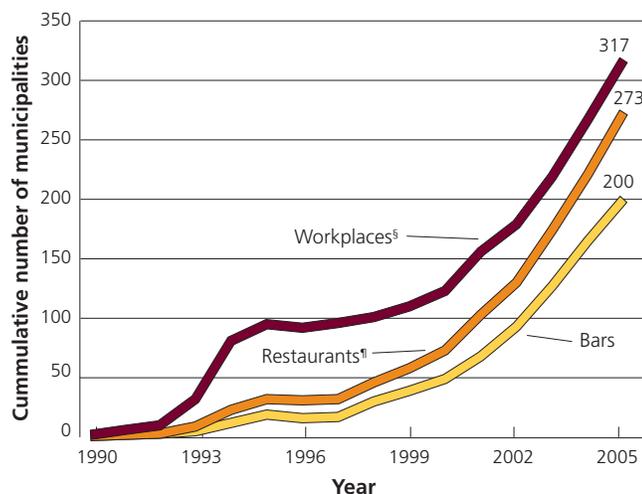
**Tobacco cessation.** Much of the risk of premature death from smoking can be prevented by smoking cessation. Smokers who quit can expect to live approximately 10 years longer than those who continue to smoke.<sup>132,171</sup> One study showed that those who quit smoking at age 60, 50, 40, or 30 gained, respectively, about 3, 6, 9, or 10 years of

## Success Story

In 2003, New York City made all workplaces, including restaurants and bars, smoke-free. This legislation was part of a more comprehensive tobacco control effort that included excise tax increases, cessation initiatives (including a free nicotine patch program), and a media campaign. Fueled in part by the tobacco industry's influence, many restaurant owners believed their business would fail under the stronger ordinance. One year after the law went into effect, however, data from the New York City Department of Finance showed that tax receipts had increased by 8.7%, or approximately \$1.4 million. Moreover, the New York State Department of Labor found no evidence that restaurants were closing as a result of the smoke-free law, and the rate of restaurant openings remained unchanged since the law went into effect.<sup>161</sup> Since the passage of the smoke-free law in 2003, 46% of people surveyed have reported less exposure to secondhand smoke.<sup>162</sup> In 2004, cigarette smoking prevalence in New York was 18.4%, down 3.2 percentage points from 21.6% in 2002.<sup>163</sup>

The lessons of New York are not unusual. Delaware, the first state to go 100% smoke-free on November 27, 2002, had similar success with its smoking ban. A year after the law went into effect, adult and youth smoking prevalence decreased by 11% and 25% respectively,<sup>164</sup> and state revenue from gaming increased by \$5.7 million.<sup>165</sup> Two months after the smoking ban went into effect, air quality improved significantly in casinos, bars, and pool halls, with the level of cancer-causing pollutants in the air dropping by 95%.<sup>166</sup>

**Figure 2D. Municipalities\*† with Local 100% Smoke-free Laws, Cumulative Number Effective, US, 1990-2005‡**



\*Includes all municipalities with ordinances or regulations that do not allow smoking in attached bars or separately ventilated rooms and do not have size exemptions. †Since some municipalities or states have 100% smoke-free provisions in more than one category, the numbers are not mutually exclusive. ‡Includes ordinances effective for any part of the year (i.e., if an ordinance was effective for the first half of 2001 but then repealed half-way through the year, that ordinance still gets counted in 2001 since it was in effect for part of the year). §Includes both public and private non-hospitality workplaces, including, but not limited to, offices, factories, and retail stores. ¶Includes any attached bar in the restaurant.

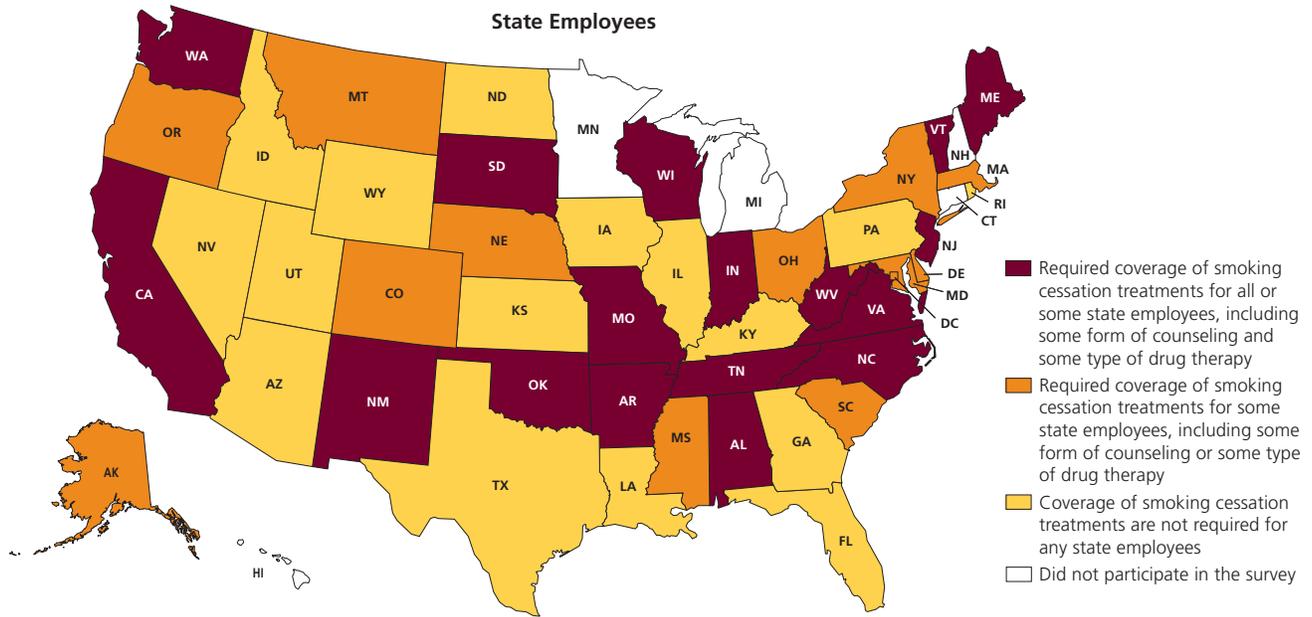
Source: American Nonsmokers' Rights Foundation. Municipalities with Local 100% Smoke-free Laws, 2005. American Cancer Society, Surveillance Research

life expectancy.<sup>171</sup> Of the 45.4 million Americans who smoke, more than 41% report attempting to quit for at least one day in the past year.<sup>135</sup> A variety of effective treatments can help smokers quit (e.g., nicotine replacement products alone or in combination with prescription medication, counseling, or behavioral therapies).<sup>172</sup> While quitting is more difficult for some smokers than others, the chances of success are approximately doubled by use of such treatments.

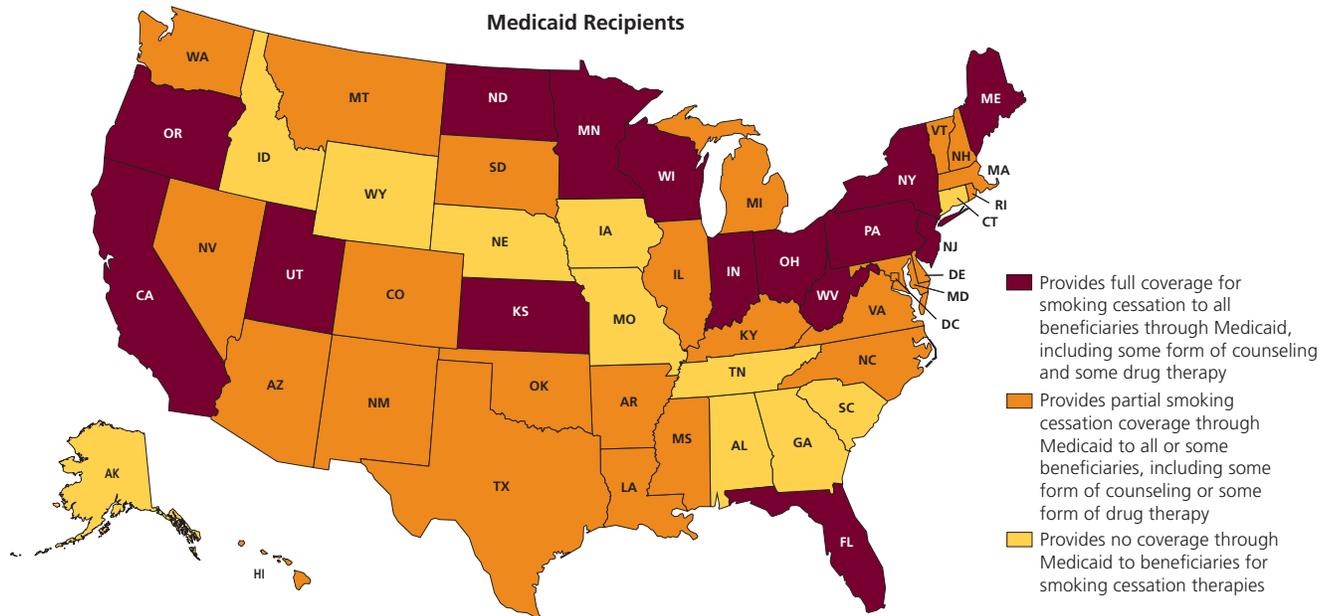
Health care providers can be especially influential in counseling and offering assistance to their patients who smoke. A recent study assessed the extent of physicians' and health care organizations' compliance with the US Public Health Service 5-step treatment model for smoking cessation, frequently referred to as the 5A's: 1) *asking*; 2) *advising*; 3) *assessing*; 4) *assisting*; and 5) *arranging*. Results indicate 90% of patients who were smokers were *asked* about their smoking status and 71% were *advised* to quit smoking. While 56% were *assessed* for their willingness to quit, only 49% were *assisted* in quitting by being provided with information and materials, specialist referrals, and pharmacotherapy. Just 9%, however, reported that their clinician *arranged* a follow-up visit or phone call about quitting.<sup>248</sup> The task of aiding



**Figure 2F. Insurance Coverage of Smoking Cessation Treatments, by State, US, 2003**



Source: Burns, et al. Insurance Coverage of Smoking Cessation Treatment for State Health Employees. *AJPH* 2004;94(8):1338-1340.



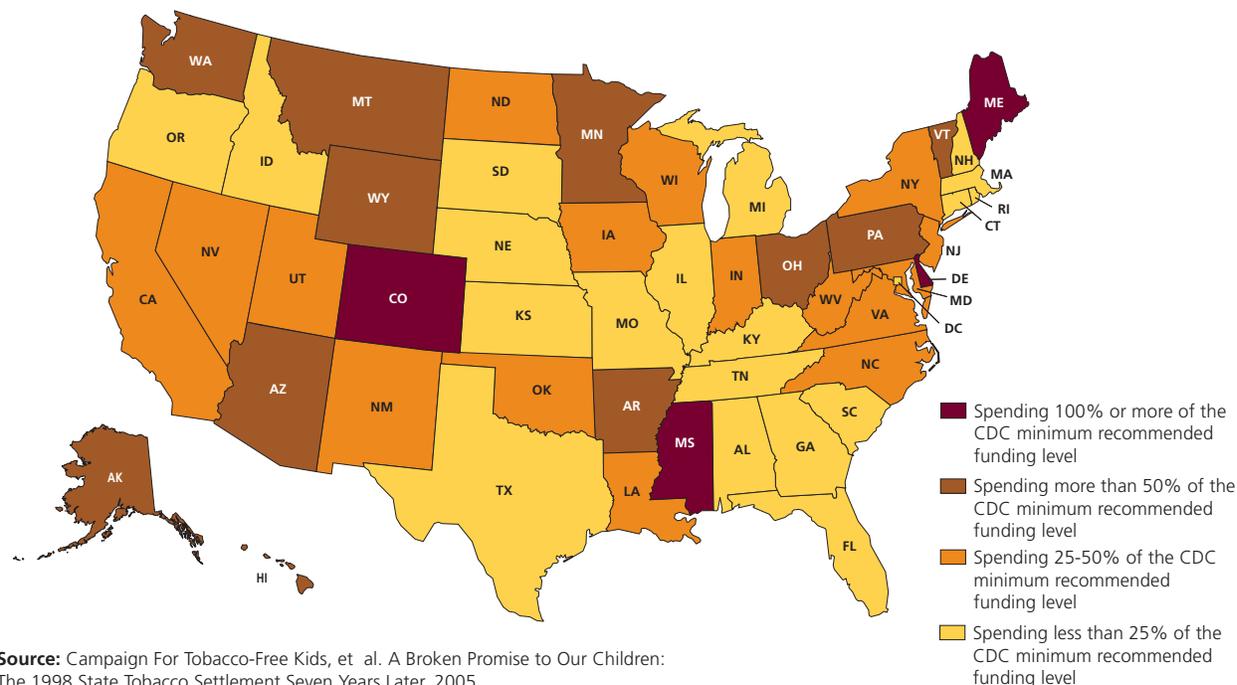
Source: Kaiser Family Foundation: "State Health Facts." Provided by National Government Relations Department, American Cancer Society, 2005.

([www.smokefree.gov](http://www.smokefree.gov)) offers online advice and downloadable information to make quitting easier. Since 2000, the American Cancer Society Quitline (1-877-YES-QUIT or 1-877-937-7848) has offered clinically proven telephone-based cessation services. The reach of this program has grown; more than 160,000 callers have been served and the quitline is expected to field 48,000 calls by year's end. For nearly three decades, the Society has designated the third Thursday in November as the Great

American Smokeout®, a day for smokers nationwide to give up their cigarettes for at least a day in the hope that they stop smoking. (For more information, refer to [www.cancer.org](http://www.cancer.org) or 1-800-ACS-2345.)

**Funding for tobacco control.** The CDC has recommended base and per-capita levels of funding for states to address all components of comprehensive tobacco control.<sup>32</sup> These range from \$7 to \$20 per capita in

**Figure 2G. Funding for Tobacco Prevention, by State, US, 2006**



smaller states (population less than 3 million), \$6 to \$17 per capita in medium-sized states (populations from 3 to 7 million), and \$5 to \$16 per capita in larger states (with populations over 7 million).<sup>32</sup> According to CDC estimates for minimal levels of tobacco control funding, about \$1.6 billion should be spent, but only \$551 million have been set aside for fiscal year 2006.<sup>182</sup> Only four states met or exceeded the CDC *Best Practices* minimum level for funding: Colorado, Delaware, Maine, Mississippi.<sup>182</sup> Eleven other states fund tobacco prevention programs at at least half the minimum levels recommended by the CDC. The remaining states fund at less than half the recommended amount (Figure 2G).<sup>182</sup>

Recent budget deficits and other political pressures caused many states to cut their funding for tobacco control. Between 2001 and 2006, 28 states reduced their spending levels for tobacco control, while only 10 states have increased their funding for tobacco control by more than \$1 per capita (Table 2B). Advocacy efforts are essential to sustain and increase funding for comprehensive tobacco control.

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

For the majority of Americans who do not use tobacco, improving diet, increasing physical activity, and maintaining a healthy weight are the most important approaches to reducing the risk of developing cancer.

While individual choices are important factors that influence dietary and physical activity habits, these choices are influenced by the social context. The US produces twice as many calories each year as are needed to maintain the health of the population. Large portion sizes and calorie-dense foods are used extensively to market foods in restaurants and supermarkets. Changes in urban design and land use have reduced opportunities for physical activity. Scientific evidence suggests that about one-third of the cancer deaths that occur in the US each year are due to nutrition and physical activity factors, including obesity.<sup>2,116</sup> Because of the link between nutrition, physical activity, and cancer, in 2002 the American Cancer Society published updated guidelines for nutrition and physical activity.<sup>99</sup> These guidelines include explicit recommendations on how communities can play an essential role in facilitating healthy dietary choices and how schools, worksites, and neighborhoods can increase opportunities for physical activity (see sidebar, page 28).

In addition to their impact on overweight and obesity, nutrition and physical activity directly affect the risk of developing or dying from certain cancers. Physical activity decreases the risk of breast, colon, and possibly endometrial and prostate cancers,<sup>183</sup> while eating a diet high in vegetables and fruits is associated with lower risk of cancers of the mouth and pharynx, esophagus, lung, stomach, colon, and rectum.<sup>204</sup>

## Obesity

Obesity is the nation's fastest growing health problem. Total US medical expenditures associated with the treatment of overweight and obesity were \$92.6 billion in 2002; Medicaid and Medicare programs together paid approximately half of these medical costs.<sup>184</sup> Overall, nearly two-thirds (65.7%) of Americans are overweight or obese. Of these, about 44.3 million adults (30%) are obese.<sup>185,186</sup> Obesity increases the risk of developing or dying from multiple diseases, including heart disease, diabetes, and many types of cancer.<sup>187</sup>

## Obesity and Cancer

The American Cancer Society was one of the first national organizations to call attention to the relationship between obesity and cancer in a special section of *Cancer Facts & Figures 2000*.<sup>188</sup> The Society's Cancer Prevention Study II (CPS II) data has proven invaluable to understanding this relationship. In 2003, the American Cancer Society released the most comprehensive study to date on the relationship between excess body weight and cancer mortality.<sup>189</sup> Higher levels of BMI were significantly associated with higher death rates from 11 types of cancer (esophageal, stomach, colorectal, liver, gallbladder, pancreatic, prostate, kidney, non-Hodgkin lymphoma, multiple myeloma, and leukemia) in men and 12 types of cancer in women (colorectal, liver, gallbladder, pancreatic, breast, cancer of the corpus and uterus, cervix, ovary, kidney, and esophagus, non-Hodgkin lymphoma, and multiple myeloma).<sup>189</sup> Moreover, for several cancers, including breast and colon cancer, even moderate levels of overweight increased mortality risk (Figure 2H).<sup>190,191</sup> Based on the observed associations, the American Cancer Society study estimated that current patterns of overweight and obesity in the United States could account for 1 in 7 cancer deaths in men and 1 in 5 in women.<sup>189</sup>

## Prevalence of Overweight and Obesity

Obesity has reached epidemic proportions in the US. The percentage of adults aged 20-74 who are obese (BMI greater than or equal to 30 kg/m<sup>2</sup>) rose from 14.6% in 1971-1974 to 31.1% in 1999-2002, with the largest increases occurring during the 1990s.<sup>192</sup> Similar trends were observed among men and women (Figure 2I). In 2004, more than half the adult population in every state was overweight or obese; the prevalence estimates varied from 53.0% in Colorado to 65.5% in Mississippi (Table 2C). The prevalence of overweight and obesity varies by region, with the lowest rates in some western and north-eastern states and the highest rates in the southeast.

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

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

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

### 2. Adopt a physically active lifestyle.

- Adults: Engage in at least moderate activity for 30 minutes or more on 5 or more days of the week; 45 minutes or more of moderate to vigorous activity on 5 or more days per week may further enhance reductions in the risk of breast and colon cancer.
- Children and adolescents: Engage in at least 60 minutes per day of moderate to vigorous physical activity at least 5 days per week.

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

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

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

#### Recommendation for Community Action

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

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

## Why Is Obesity Increasing?

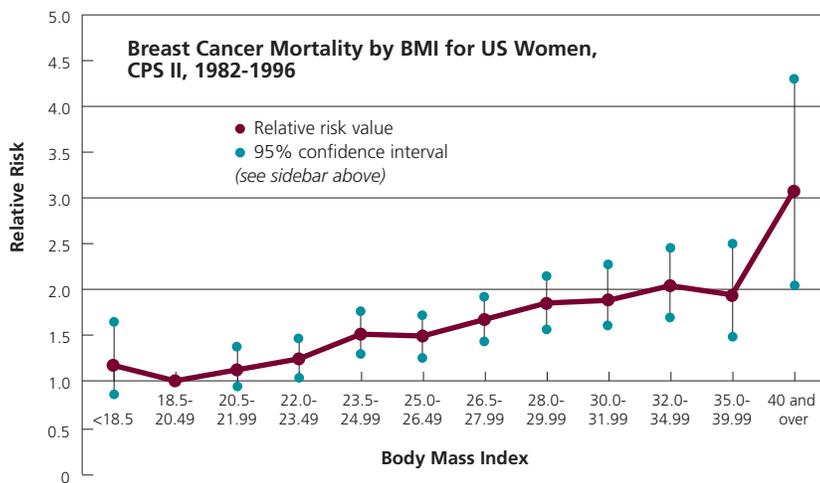
The sudden increase in obesity has occurred because of social changes that have increased caloric consumption and decreased energy expenditure in the population.<sup>194</sup> For most Americans, both excessive caloric intake and inadequate physical activity are important factors. Calorie-dense foods (in which fats and sugars make up much of the caloric content per serving) are cheaper, more widely available, and more aggressively marketed than healthy foods (such as vegetables and fruits). Large portion sizes are used to attract customers in fast-food and other restaurants, and vending machines that dispense calorie-dense foods are ubiquitous at worksites, schools, and hotels. Opportunities for physical activity as

## What is relative risk? What is the confidence interval?

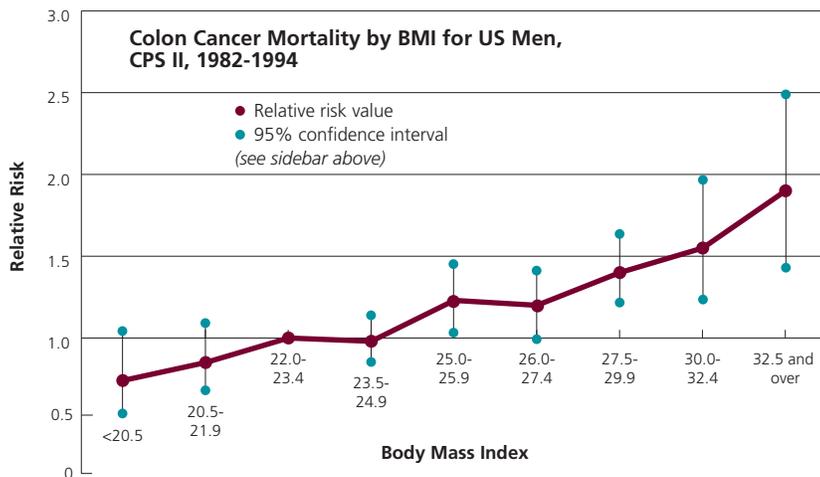
A *relative risk* compares the risk of disease among people with a particular exposure to the risk among people without that exposure. If the relative risk is above 1.0, then risk is higher among exposed than unexposed persons. If the relative risk is below 1.0, then risk is lower among exposed than unexposed persons. However, while relative risks are useful for comparisons, they do not provide information about the absolute amount of additional risk experienced by the exposed group.

A *confidence interval* is a statistical estimate of the range in which the true value is likely to fall. For example, if we estimate the relative risk to be 2.5, and the 90% confidence interval ranges between 2.2 and 2.9, this means that if we were to repeat the study 100 times, in 90 out of 100 samples surveyed, the true relative risk would fall within that range. Similarly, a 95% confidence interval will contain the true value 95 out of 100 times.

**Figure 2H. Cancer Mortality by Body Mass Index (BMI) in the Cancer Prevention Study II (CPS II)**



**Source:** Petrelli JM, et al. Body mass index, height, and postmenopausal breast cancer mortality in a prospective cohort of US women. *Cancer Causes Control* 2002;13:325-332. ©2002 Kluwer Academic Publishers, Netherlands.



**Source:** Murphy TK, et al. Body mass index and colon cancer mortality in a large prospective study. *Am J Epidemiol.* 2000 No 1;152(9):847-854. ©2000 by the Johns Hopkins University School of Hygiene and Public Health.

American Cancer Society, Epidemiology and Surveillance Research

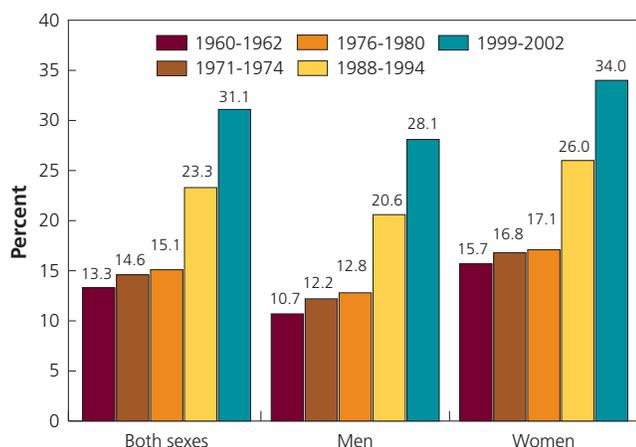
part of daily life have been reduced or eliminated in most schools, workplaces, and communities.<sup>195</sup> A recent study showed that less than 1 in 4 trips for transportation made by adult American men and women were by walking. Communities with high-density populations may promote walking by favoring urban design models that include mass transit systems, which greatly reduce the reliance on cars and private transportation.<sup>196</sup> In contrast, suburban areas often consist of physical environments that encourage use of private transportation even for short distances.

## Prevalence and Trends in Physical Activity

The measure of physical activity that has been routinely tracked in population surveillance in the US is leisure-time physical activity. Over the past decade, leisure-time physical activity has changed little among adults.<sup>76,197</sup> In 2004, 23.8% of adults reported no leisure-time physical activity; in 2003, 46.1% reported engaging in moderate levels of activity, and 25.8% in vigorous levels of physical activity. Across the 50 states and the District of Columbia, the proportion of adults engaging in physical activity varies greatly. Generally, states with a high percentage of people reporting no leisure-time physical activity have a higher prevalence of overweight and obesity (Table 2C).

Some minority subgroups of the population appear to engage in less leisure-time physical activity than whites. However, such reports are limited because leisure-time physical activity does not reflect physical activity at work.<sup>76</sup> It has been argued that studies that attempt to measure total physical activity (i.e., work-related and leisure-time physical activity) can provide a more reliable assessment of the socio-economic disparities in physical activity.<sup>198</sup>

**Figure 2I. Adult Obesity\*, by Gender, Ages 20-74, US, 1960-2002†**



\*Body mass index of 30 kg/m<sup>2</sup> or greater. †Age adjusted to the 2000 US standard population.

Source: 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, 2004, With Chartbook on Trends in the Health of Americans. Hyattsville, Maryland: 2004.

American Cancer Society, Surveillance Research

Physical activity is a complex behavior that is assessed in population surveys by asking participants about the intensity, duration, and frequency (per hour, per day, etc.) of their activities, the surrounding environment (seasonal variation in activities due to weather), and social conditions (physical activity at home, at work, for transportation, for leisure, for sports, etc.). Using surveys to measure total physical activity is difficult. With the greater emphasis on studies of the relationship between physical activity and health, researchers need more accurate and reliable methods of estimating physical activity and energy expenditure. New technologies are being evaluated to provide a more objective assessment of physical activity. These include portable monitoring devices such as pedometers, accelerometers, and tools to record physiologic response to physical activity, such as heart rate monitors, etc.<sup>199</sup>

It is important to understand how to promote more active lifestyles. Since the first publication of the Surgeon General's Report on Physical Activity and Health in 1996, researchers have studied the factors that modify physical activity in order to design interventions and effective programs to increase physical activity in a variety of settings, such as schools, worksites, and communities.

**Benefits of an active lifestyle.** Regular physical activity substantially reduces the risk of dying of coronary heart disease, the nation's leading cause of death, and decreases the risk for stroke, colon cancer, breast cancer,

## Defining Body Mass Index

Different measures are used to determine whether a person is considered normal weight, overweight, or obese, taking height into account. A common scale is the body mass index (BMI), or ratio of weight (in kilograms) to height (in meters, squared). For adults aged 20 years and older, overweight is defined as a BMI of 25.0-29.9 kg/m<sup>2</sup>; obesity is defined as a BMI of 30.0 kg/m<sup>2</sup> or greater. Although BMI may overestimate body fat in athletes and others who have a muscular build, or underestimate body fat in older persons who have lost muscle mass,<sup>193</sup> it is in general a reliable indicator of total body fat.

This table relates BMI to pounds and inches rather than kilograms and meters. For example, a 5'4" woman is considered overweight if she weighs between 145 and 173 pounds. She is obese if she weighs 174 pounds or more. A 5'10" man is considered overweight if he weighs between 174 and 206 pounds and obese if he weighs 207 pounds or more.

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

\*Overweight defined as Body Mass Index of 25-29.9 kg/m<sup>2</sup>.

†Obesity defined as Body Mass Index of 30 kg/m<sup>2</sup> or greater

diabetes, and high blood pressure. Physical activity also helps to control weight (potentially decreasing the risk of the many cancers related to excess weight), contributes to healthy bones, muscles, and joints, reduces falls among older adults, helps to relieve the pain of arthritis, reduces symptoms of anxiety and depression, and is associated with fewer hospitalizations, physician visits, and medications.<sup>76,183,187,200</sup> Moreover, physical activity need not be strenuous to be beneficial; people of all ages benefit from participating in regular, moderate physical

**Table 2C. Overweight, Obesity, and Related Factors, Adults 18 and Older, by State, US, 2003 & 2004**

	2004				2003					
	% Clinical overweight (25.0-29.9 kg/m <sup>2</sup> )	% Clinical obese (30.0 kg/m <sup>2</sup> or greater)	% Overweight (25.0 kg/m <sup>2</sup> or greater)	State Rank*	% No leisure-time physical activity	% Vigorous physical activity†	% Moderate physical activity‡	% Eating five or more fruit and vegetable servings a day	% Eating three or more vegetable servings a day	% Eating two or more fruit servings a day
Alabama	35.8	28.9	64.7	49	29.7	21.3	40.3	22.4	12.2	10.9
Alaska	38.7	23.8	62.4	41	20.4	34.6	58.1	22.6	6.4	15.7
Arizona	34.9	21.3	56.2	6	24.3	28.9	49.6	22.9	8.3	13.6
Arkansas	36.4	26.1	62.5	42	26.5	23.4	45.4	20.8	13.6	11.6
California	37.9	22.3	60.2	25	22.8	28.6	46.7	26.9	8.4	24.2
Colorado	36.2	16.8	53.0	1	18.7	33.0	55.0	24.2	9.3	19.4
Connecticut	36.4	19.7	56.2	7	18.9	30.6	51.6	29.8	8.6	20.7
Delaware	38.7	21.1	59.8	20	21.8	23.3	43.7	22.0	10.1	10.5
Dist. of Columbia	32.8	22.6	55.4	4	22.3	32.7	52.1	29.5	10.3	19.4
Florida	36.9	23.0	59.9	22	23.8	21.5	41.2	23.4	9.5	14.3
Georgia	34.9	24.8	59.7	19	25.9	25.0	42.4	22.8	13.1	11.1
Hawaii	¶	¶	¶	¶	¶	26.4	49.9	27.6	10.3	7.5
Idaho	37.4	20.8	58.3	14	19.1	31.9	55.9	20.4	6.5	15.8
Illinois	36.5	23.0	59.5	18	24.9	23.5	43.7	23.0	7.7	16.1
Indiana	36.7	25.5	62.2	40	25.3	25.3	46.8	22.0	8.4	14.5
Iowa	37.4	23.5	60.9	29	21.3	21.0	43.6	17.1	6.3	11.3
Kansas	37.5	23.2	60.7	28	23.2	22.8	43.9	18.8	6.0	8.4
Kentucky	37.6	25.8	63.5	46	29.8	16.4	33.8	18.2	14.0	3.4
Louisiana	35.7	26.9	62.6	43	29.8	21.5	40.2	16.4	11.7	5.4
Maine	37.6	23.4	61.0	31	21.5	29.1	53.0	26.9	10.3	17.6
Maryland	34.7	23.9	58.6	16	21.8	29.0	49.3	28.8	12.2	19.7
Massachusetts	36.2	18.4	54.6	3	20.0	31.1	52.7	29.0	8.7	19.6
Michigan	35.4	25.4	60.9	30	22.2	26.6	47.4	20.0	5.3	16.4
Minnesota	37.7	22.6	60.3	26	15.9	26.4	49.0	24.3	5.9	18.4
Mississippi	36.0	29.5	65.5	50	31.4	20.3	40.3	17.8	11.2	8.3
Missouri	36.8	25.0	61.7	37	24.8	22.6	45.2	20.1	8.5	11.6
Montana	37.4	19.7	57.1	9	18.8	33.3	58.6	22.0	6.0	15.9
Nebraska	38.6	23.2	61.8	38	21.5	21.7	44.6	17.8	5.5	9.7
Nevada	38.9	21.1	60.0	24	24.3	30.3	50.8	20.4	4.7	16.6
New Hampshire	36.1	21.6	57.7	10	18.6	31.0	54.7	28.4	10.1	19.0
New Jersey	37.9	22.0	59.9	21	25.7	25.4	44.8	26.6	7.7	17.0
New Mexico	36.4	21.5	57.9	13	21.1	28.6	51.4	22.4	8.0	14.9
New York	35.7	22.1	57.8	12	26.6	24.6	44.5	25.7	7.0	19.5
North Carolina	37.1	24.3	61.4	36	24.8	19.3	37.7	23.2	15.0	7.4
North Dakota	38.3	24.6	62.9	44	21.3	26.8	49.4	21.4	6.0	17.1
Ohio	35.8	25.3	61.1	33	23.0	26.0	46.9	22.6	7.1	15.5
Oklahoma	36.1	24.9	61.0	32	27.7	19.6	40.0	15.4	8.5	3.9
Oregon	37.8	21.2	59.0	17	17.2	30.5	53.9	24.1	8.9	18.6
Pennsylvania	36.8	24.3	61.2	34	24.4	26.3	49.3	24.7	6.9	18.8
Rhode Island	36.9	19.0	55.9	5	24.2	29.6	50.3	27.0	8.3	17.6
South Carolina	36.1	25.2	61.3	35	23.9	25.9	46.2	22.2	12.5	14.1
South Dakota	38.0	23.9	61.8	39	19.0	22.0	46.6	19.0	4.0	12.6
Tennessee	36.9	27.3	64.2	48	29.7	20.0	37.6	22.2	15.6	5.8
Texas	37.2	25.8	63.0	45	26.1	26.1	44.7	22.5	11.1	15.6
Utah	36.1	20.4	56.5	8	16.9	35.6	57.1	19.4	7.2	16.5
Vermont	35.6	18.7	54.4	2	18.2	32.3	55.9	32.5	10.7	21.9
Virginia	36.8	23.1	60.0	23	21.9	28.1	49.4	25.8	11.7	16.7
Washington	36.2	22.2	58.4	15	17.2	31.3	54.4	23.3	8.6	17.9
West Virginia	36.3	27.7	64.0	47	24.6	19.1	42.7	18.7	11.0	7.1
Wisconsin	37.2	23.3	60.5	27	18.4	30.3	54.8	21.5	6.1	18.2
Wyoming	36.9	20.9	57.8	11	20.1	32.1	55.4	22.1	7.4	14.8
United States§	36.7	23.5	60.2		23.8	25.8	46.1	23.6	9.1	16.0
Range	32.8-38.9	16.8-29.5	53.0-65.5		15.9-31.4	16.4-35.6	33.8-58.6	15.4-32.5	4.0-15.6	3.4-24.2

\*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 increase 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. ¶Estimate not available as state did not participate in 2004 survey.

Source: Behavioral Risk Factor Surveillance System Public Use Data Tape 2003, 2004, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2004, 2005.

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## Moderate Physical Activity Examples\*

Washing and waxing a car for 45-60 minutes

Washing windows or floors for 45-60 minutes

Playing volleyball for 45 minutes

Playing touch football for 30-45 minutes

Gardening for 30-45 minutes

Wheeling self in wheelchair for 30-40 minutes

Walking 1¾ miles in 35 minutes (20 minutes per mile)

Basketball (shooting baskets) for 30 minutes

Bicycling 5 miles in 30 minutes

Dancing fast (social) for 30 minutes

Pushing a stroller 1.5 miles in 30 minutes

Raking leaves for 30 minutes

Walking 2 miles in 30 minutes (15 minutes per mile)

Water aerobics for 30 minutes

Swimming laps for 20 minutes

Wheelchair basketball for 20 minutes

Basketball (playing a game) for 15-20 minutes

Bicycling 4 miles in 15 minutes

Jumping rope for 15 minutes

Running 1.5 miles in 15 minutes (10 minutes per mile)

Shoveling snow for 15 minutes

Stairwalking for 15 minutes

Less Vigorous,  
More Time

More Vigorous,  
Less Time

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

**Adapted from:** Chronic Disease Notes & Reports, a publication of the CDC.<sup>171</sup>

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

- Bicycle 5 miles in 30 minutes
- Walk 2 miles in 30 minutes or run 1.5 miles in 15 minutes
- Garden for 30 minutes
- Play volleyball for 45 minutes

activity, such as 30 minutes of brisk walking five or more times a week. Participating in moderate physical activity is a vital component of a healthy lifestyle for people of all ages and abilities. There is no demographic or social group that could not benefit from becoming more active.<sup>76</sup>



Social, environmental, and economic changes have contributed to reduced levels of physical activity. More and more communities are structured for automobile travel and do not provide sidewalks, stores, or schools within walking distance of homes.<sup>201</sup> In fact, walking excursions decreased by 42% for the average American adult between 1975 and 1995.<sup>202</sup> Furthermore, workplace activities largely have shifted from manual labor to white-collar jobs.<sup>202</sup>

## Strategies to Prevent Obesity and Promote Healthy Lifestyles

A 2001 Surgeon General Report recognized the obesity epidemic as a serious public health problem and called for collaborative efforts among governmental and private health organizations, the food industry, employers, the media, and communities to address the issue.<sup>5</sup> The National Institutes of Health's multidisciplinary Obesity Research Task Force, formed in 2003, published a strategic research plan that focuses on defining more precisely the causes of the obesity problem, identifying interventions that will help people maintain a healthy body weight, and improving the treatment of obesity. The research may include biological, psychological, and social factors that promote caloric imbalance, identifying barriers to behavioral change, and developing effective and cost-effective interventions and treatments.<sup>203</sup>

In 2001, based on a systematic review of the effectiveness of community interventions to increase physical activity, the Task Force on Community Preventive Services strongly recommended the following interventions: community-wide campaigns, use of signs near stairs to encourage people to use them, social support inter-

vention (i.e., social networks that provide supportive relationships for physical activity behavior change such as setting up walking groups among friends), and environmental and policy approaches to create and improve access to places for physical activity in the community and worksites.<sup>200</sup> Other government organizations (such as the CDC and state health departments) and nonprofit organizations have formed coalitions to develop and implement public health strategies to address the epidemic of overweight and obesity.<sup>5</sup> The following are some approaches that have been proposed (see sidebar below).

### Approaches to Improving Physical Activity and Nutrition<sup>5,64</sup>

- Limit advertising and marketing in schools of foods and beverages with low nutritional values.
- Encourage restaurants to provide nutrition information on menus (e.g., calories, fat, transfat, sugars, etc.).
- Invest in community designs that support development of sidewalks, bike lanes, and access to parks and green space.
- Increase physical education requirements in schools K-12.
- Implement large-scale marketing campaigns, targeting consumers and decision-makers, to increase awareness of the lifestyle/cancer connection and motivate people to take action to make their worksites, schools, and communities more “health friendly.”
- Develop and promote “communities of excellence” in nutrition and physical activity that exemplify policy and environmental changes within worksites, schools, and communities that increase access to healthy foods and opportunities for physical activity.
- Increase federal funding so states can implement comprehensive nutrition and physical activity plans.
- Encourage collaboration between government, nonprofit, and private sectors to develop research and intervention programs.
- Increase resources from governmental and nongovernmental sources to facilitate a strategic and action-oriented plan to address the obesity problem.

### Vegetable and Fruit Consumption

The International Agency for Research on Cancer (IARC) published a report in 2003 documenting the preventive effect of vegetables and fruit consumption on cancer, particularly cancers of the mouth and pharynx, esophagus, larynx, lung, stomach, kidney, ovary (vegetables only), colon and rectum, and bladder (fruit only).<sup>204</sup> The specific protective factors in vegetables and fruits have

not been identified with certainty, and it is possible that vegetable and fruit consumption may be a marker for some other associated dietary or lifestyle factor. The IARC review concluded that the evidence supported the current recommendations of many organizations (including the American Cancer Society) to promote consumption of vegetables and fruits for the reduction of cancer risk.<sup>204</sup> In 2005, the federal government updated the Dietary Guidelines for Americans,<sup>205</sup> which are consistent with the American Cancer Society recommendations (see sidebar, page 26).

Since its inception in 1991, the national 5 A Day for Better Health Program has become one of the most widely recognized health promotion programs in the world. The largest public/private partnership for nutrition education, the program is a combined effort of the National Cancer Institute (NCI), the Produce for Better Health Foundation, the American Cancer Society, the American Heart Association, the American Diabetes Association, the CDC, the US Department of Agriculture, United Fresh Fruit and Vegetable Association, Produce Marketing Association, and the National Alliance for Nutrition and Activity. Designed to promote the consumption of 5 to 9 servings of vegetables and fruits daily, the program was recently evaluated and showed that awareness of the 5 A Day Program message has increased among adults.<sup>206</sup> Two campaigns for adults initiated in 2003 are targeted at men – the Men’s 9 A Day campaigns and African-American Men’s 9 A Day campaign. Media campaigns directed at African American men have included radio spots on ABC’s Urban Advantage Network, and an Internet site featuring upbeat messages and tips for changing dietary habits. The NCI brochure, “Men Eat 9 A Day,” is distributed by NCI’s partners, including the National Association for the Advancement of Colored People and the National Medical Association (NMA). Through the National Newspaper Publishers Association, NCI collaborates with African American-owned newspapers across the country on a column, *Eat Better, Live Better*.<sup>207</sup> More information can be found at [www.5aday.gov](http://www.5aday.gov).

Despite these efforts, consumption of vegetables and fruit remains below recommended levels. Only 23.5% of Americans reported eating five or more servings of vegetables and fruit daily in 2003. This ranged from 15.4% in Oklahoma to 32.5% in Vermont (Table 2C). In general, the proportion of adults eating three or more servings of vegetables per day is even lower than the proportion of adults consuming two or more fruit servings per day (Table 2C).

## Success Stories

### Five community programs to improve physical activity and nutrition

#### Colorado Physical Activity and Nutrition State Plan 2010 (COPAN)

COPAN was created by the Colorado Coalition on Physical Activity and Nutrition and the Colorado Department of Public Health and Environment, and it includes specific steps to address the obesity epidemic. The Colorado on the Move™ component works through schools, worksites, and communities to encourage residents to increase walking by 2,000 steps per day (about a mile). The program offers pedometers to help participants count their steps and increase their daily activity levels. Over 100,000 pedometers have been distributed in Colorado, and an initial evaluation indicates that most participants have been able to add 2,000 steps to their day's activities. The nutritional component, Colorado 5 A Day for Better Health, emphasizes daily consumption of five or more servings of fruits and vegetables. An evaluation documented that from 1994 to 2000, the percentage of Colorado adults who consumed at least 5 servings of fruits and vegetables daily increased from 21.6% to 23.4% and the average number of daily servings increased from 3.7 to 3.9 servings per day.<sup>208</sup> Because the increases in consumption were so modest, future efforts will seek better strategies for greater impact.

#### The Seattle 5 A Day program

This is a tested intervention for worksites to increase employees' vegetable and fruit consumption using both environmental approaches (in the cafeteria and more broadly, at work) and individual behavioral strategies. At the worksite, an employee advisory board develops activities to recruit employees for participation in the program. Examples of activities include messages to raise awareness about consumption of vegetables and fruits; changes in the employee worksite cafeteria, including point-of-purchase displays, signs identifying foods as 5 A Day foods, and spotlights on healthy eating; and, in some instances, incentives for eating more vegetables and fruits. Messages are delivered through posters, newsletters, table tents, and a self-help manual. A program evaluation found that the intervention produced both an increase in employee use of materials and activities and increases in consumption of vegetables and fruits.<sup>209</sup>

#### The WISEWOMAN Program

The Well-Integrated Screening and Evaluation for Women Across the Nation (WISEWOMAN) program is a CDC-sponsored program implemented in 15 communities across the US. The WISEWOMAN programs operate at the local level through community partnerships that help strengthen the program by pooling resources and sharing lessons learned. Specifically, the program targets disadvantaged women who are particularly

vulnerable to obesity, smoking, and other risk factors for chronic disease. The mission is to provide low-income and uninsured women, aged 40-64, with the knowledge, skills, and opportunities to improve diet, physical activity, and other lifestyle behaviors to prevent, delay, and control chronic diseases. The program offers these women a comprehensive approach to preventive services (screening for chronic risk factors such as smoking and overweight) and promotes behavioral change through education, counseling, and culturally appropriate activities that foster healthy lifestyles.<sup>210</sup> An evaluation study of the Massachusetts WISEWOMAN project documented significant increases in the daily consumption of vegetables and fruits and participation in moderate levels of physical activity at least three times a week for 30 minutes or more per day.<sup>211</sup>

#### Body & Soul: A Celebration of Healthy Living

This joint program of the American Cancer Society, the NCI, and CDC works through faith-based communities to encourage African Americans to eat at least five servings of vegetables and fruits each day. The program includes pastoral support and involvement, church activities, and policy and environmental changes within the church. A randomized effectiveness trial conducted among approximately 1,000 members from 15 African American churches demonstrated that at the 6-month follow up, participants reported increased vegetable and fruit consumption and greater motivation to eat those foods, as well as significant decreases in fat consumption.<sup>212</sup> Three Society Divisions (California, Texas, and the Great Lakes) have implemented Body & Soul programs. The California Division has offered grants to local African American churches (48 statewide) to assist in implementing and promoting the program, and has a pilot of the Body & Soul program in a Latino church to assess its value in Hispanic communities.

#### The Wheeling Walks Program

This community-wide program to promote walking was recently tested in Wheeling, West Virginia. It included a 12-week participatory process, research, message development, three educational multimedia (print, television, and radio) ads, and ongoing advocacy for policy and environmental change. The campaign promoted walking for inactive adults aged 50 to 65, who had earlier identified walking as their preferred exercise should they initiate an exercise program. An evaluation revealed that the intervention achieved increased levels of walking among the least active (i.e., sedentary participants at baseline). The success of this intervention was due to the high levels of exposure to the educational media campaign that succeeded in changing the community's attitudes toward walking. Advocacy groups involved with the program worked with the West Virginia legislature to pass a resolution of commendation for the campaign.<sup>213</sup>

# Cancer Screening

Aside from avoiding tobacco and maintaining a healthy weight, following recommendations from the American Cancer Society or US Preventive Services Task Force for cancer screening is the most important thing people can do to reduce their chances of dying from cancer. Screening can identify persons who may have cancer or pre-cancerous tissue changes that warrant further evaluation. It can also detect cancers earlier in their development, which often can improve the effectiveness of treatment and prevent death. In some cases, such as screening for colorectal or cervical cancers, screening can prevent cancer altogether. Screening has been shown to reduce mortality from cancers of the breast, cervix, and colon and rectum, and there are other cancers for which screening may be associated with lower mortality, but the evidence is less certain.<sup>214</sup> The American Cancer Society screening guidelines for early detection of cancer in people with no symptoms of cancer are shown on page 34.

The American Cancer Society promotes multiple interventions to improve screening rates and quality through direct education to consumers and health professionals, public policy, advocacy, and increased research funding. The Society is committed to funding research focused on early cancer detection and reshaping public policy so that state-of-the-art cancer screening is improved at the community level, particularly among medically underserved populations. By improving and promoting screening, we will help meet our 2015 challenge goals of reducing suffering and death due to cancer.

## Breast Cancer Screening

Breast cancer screening has been shown to reduce breast cancer mortality. Currently, 63.7% of breast cancers are diagnosed at a localized stage, for which the 5-year survival rate is 97.9%.<sup>215</sup> The relatively high rates of early detection of breast cancer can be attributed to use of mammography screening as well as high awareness of breast cancer symptoms in the population.

National breast cancer screening data are available from two different sources: the National Health Interview Survey (NHIS) and the Behavioral Risk Factor Surveillance System (BRFSS), both of which measure screening within the past year and past two years. According to a study of cancer screening trends using NHIS data, the percentage of women aged 40 years and older who reported having had a mammogram within the past two years (within the US Preventive Services Task Force

recommendations) increased from 29% in 1987 to 70% in 2000.<sup>216</sup> In 2003, the reported percentage was 69.7%. White and African American women aged 40 and older had the same prevalence of mammography use in the past two years (70.4%). In contrast, other race/ethnic subgroups of women were less likely to have had a mammogram in the past two years (Table 3A). The lowest prevalence of mammography use in the past two years occurred among women who lack health insurance (40.2%), followed by immigrant women who have lived in the US for less than 10 years (52.3%) (Table 3A). The lower participation in mammography screening among poor women is a concern because studies show that these women are more likely to have their breast cancers detected at an advanced stage when treatment is likely

**Table 3A. Mammography, Women 40 and Older, US, 2003**

Characteristic	% Mammogram within the past 2 years*	% Mammogram within the past year*
<b>Race/ethnicity</b>		
White (non-Hispanic)	70.4	55.5
African American (non-Hispanic)	70.4	54.2
Hispanic/Latina	66.1	52.6
American Indian/Alaskan Native†	68.6	54.8
Asian‡	58.8	48.0
<b>Education (years)</b>		
11 or fewer	57.9	43.7
12	67.5	52.2
13 to 15	72.0	57.7
16 or more	80.1	65.4
<b>Health insurance coverage</b>		
Yes	73.1	58.0
No	40.2	28.9
<b>Immigration§</b>		
Born in US	70.5	55.4
Born in US territory	67.1	58.7
In US less than 10 yrs	52.3	40.6
In US 10 years or more	66.5	53.0
<b>Total</b>	<b>69.7</b>	<b>54.9</b>

\*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.

**Note:** Preliminary estimates subject to adjustment based on official statistics released by NCHS.

**Source:** National Health Interview Survey Public Use Data File 2003, National Center for Health Statistics, Centers for Disease Control and Prevention, 2005.

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# Screening Guidelines

## For the Early Detection of Cancer in Asymptomatic People

Site	Recommendation
<b>Breast</b>	<ul style="list-style-type: none"><li>• Yearly mammograms are recommended starting at age 40. The age at which screening should be stopped should be individualized by considering the potential risks and benefits of screening in the context of overall health status and longevity.</li><li>• Clinical breast exam should be part of a periodic health exam, about every 3 years for women in their 20s and 30s, and every year for women 40 and older.</li><li>• Women should know how their breasts normally feel and report any breast change promptly to their health care providers. Breast self-exam is an option for women starting in their 20s.</li><li>• Women at increased risk (e.g., family history, genetic tendency, past breast cancer) should talk with their doctors about the benefits and limitations of starting mammography screening earlier, having additional tests (i.e., breast ultrasound and MRI), or having more frequent exams.</li></ul>
<b>Colon &amp; rectum</b>	<p>Beginning at age 50, men and women should begin screening with 1 of the examination schedules below:</p> <ul style="list-style-type: none"><li>• A fecal occult blood test (FOBT) or fecal immunochemical test (FIT) every year</li><li>• A flexible sigmoidoscopy (FSIG) every 5 years</li><li>• Annual FOBT or FIT and flexible sigmoidoscopy every 5 years*</li><li>• A double-contrast barium enema every 5 years</li><li>• A colonoscopy every 10 years</li></ul> <p><i>*Combined testing is preferred over either annual FOBT or FIT, or FSIG every 5 years, alone. People who are at moderate or high risk for colorectal cancer should talk with a doctor about a different testing schedule.</i></p>
<b>Prostate</b>	<p>The PSA test and the digital rectal examination should be offered annually, beginning at age 50, to men who have a life expectancy of at least 10 years. Men at high risk (African American men and men with a strong family history of 1 or more first-degree relatives diagnosed with prostate cancer at an early age) should begin testing at age 45. For both men at average risk and high risk, information should be provided about what is known and what is uncertain about the benefits and limitations of early detection and treatment of prostate cancer so that they can make an informed decision about testing.</p>
<b>Uterus</b>	<p><b>Cervix:</b> Screening should begin approximately 3 years after a woman begins having vaginal intercourse, but no later than 21 years of age. Screening should be done every year with regular Pap tests or every 2 years using liquid-based tests. At or after age 30, women who have had 3 normal test results in a row may get screened every 2 to 3 years. Alternatively, cervical cancer screening with HPV DNA testing and conventional or liquid-based cytology could be performed every 3 years. However, doctors may suggest a woman get screened more often if she has certain risk factors, such as HIV infection or a weak immune system. Women 70 years and older who have had 3 or more consecutive normal Pap tests in the last 10 years may choose to stop cervical cancer screening. Screening after total hysterectomy (with removal of the cervix) is not necessary unless the surgery was done as a treatment for cervical cancer.</p> <p><b>Endometrium:</b> The American Cancer Society recommends that at the time of menopause all women should be informed about the risks and symptoms of endometrial cancer, and strongly encouraged to report any unexpected bleeding or spotting to their physicians. Annual screening for endometrial cancer with endometrial biopsy beginning at age 35 should be offered to women with or at risk for hereditary nonpolyposis colon cancer (HNPCC).</p>
<b>Cancer-related checkup</b>	<p>For individuals undergoing periodic health examinations, a cancer-related checkup should include health counseling, and, depending on a person's age and gender, might include examinations for cancers of the thyroid, oral cavity, skin, lymph nodes, testes, and ovaries, as well as for some nonmalignant diseases.</p>

American Cancer Society guidelines for early cancer detection are assessed annually in order to identify whether there is new scientific evidence sufficient to warrant a reevaluation of current recommendations. If evidence is sufficiently compelling to consider a change or clarification in a current guideline or the development of a new guideline, a formal procedure is initiated. Guidelines are formally evaluated every 5 years regardless of whether new evidence suggests a change in the existing recommendations. There are 9 steps in this procedure, and these "guidelines for guideline development" were formally established to provide a specific methodology for science and expert judgment to form the underpinnings of specific statements and recommendations from the Society. These procedures constitute a deliberate process to ensure that all Society recommendations have the same methodological and evidence-based process at their core. This process also employs a system for rating strength and consistency of evidence that is similar to that employed by the Agency for Health Care Research and Quality (AHCQR) and the US Preventive Services Task Force (USPSTF).

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to be less effective.<sup>217</sup> The American Cancer Society recommends yearly mammograms for women starting at age 40; the 2003 NHIS survey found that only 54.9% of women reported having a mammogram within the past year.

According to data collected in 2004 (Table 3B), the percentage of women aged 40 and older who reported having a mammogram in the last year ranged from 47.7% in Idaho to 69.7% in Delaware. Utah, the only state for which state law does not take steps to improve private insurance coverage for mammography screening, had the second lowest prevalence of mammography use (48.9%).<sup>218</sup> For a recent mammogram and clinical breast exam, the screening participation rates were 3.8 to 11.0 percentage points lower, ranging from 42.9% in Utah to 63.9% in Delaware. 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 3B).

### 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 pre-cancerous lesions.<sup>219</sup> The Society played a critical role in promoting the use of the Pap test. Cervical cancer is now one of the most successfully treated cancers.<sup>219</sup>

The primary cause of cervical cancer is infection with certain types of human papillomavirus (HPV), which are extremely common, although the majority of infections do not persist or progress to cervical cancer. Two types of HPV virus (HPV-16 and HPV-18) are associated with 70% of all cervical cancers.<sup>220</sup> In the US and other developed countries, HPV testing may be used in addition to cytologic testing for cervical cancer screening. Such

testing may also provide an alternative to cytologic screening in countries with more limited resources. Vaccines have been developed against HPV-16 and HPV-18, and recent clinical trials show that these are effective in preventing persistent, new infections.<sup>220,221</sup> With sufficient evidence from clinical trials that these vaccines are both beneficial and safe, they may be recommended for young adolescents to prevent HPV infection before the onset of sexual activity.<sup>222</sup>

In 1987, approximately three-quarters (73%) of women aged 25 years old and older had a Pap test within the past three years, and by 2000, the proportion had increased to 82%.<sup>216</sup> In 2003, among women 18 years and older whose hysterectomy status was not determined, prevalence of Pap test use was 79.3%. Not surprisingly, the lowest prevalence of cervical cancer screening was among women with no health insurance (61.0%). The prevalence of cervical cancer screening varied by race and ethnicity: Asian (68.4%), Hispanics (74.7%), non-Hispanic white (80.2%), non-Hispanic African American (82.5%), and American Indian/Alaska Native (86.0%) (Table 3C). Across the states surveyed by the Behavioral Risk Factor Surveillance System in 2004 (Table 3D), the recent Pap test percentage among women aged 18 and older, was 85.2%, ranging from 77.4% in Utah to 89.8% in New Hampshire.

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

- The CDC's National Breast and Cervical Cancer Early Detection Program (NBCCEDP) helps low-income, uninsured, and underserved women gain access to screening exams for early detection of breast and cervical cancers. The program is currently implemented in all 50 states, the District of Columbia, four US territories, and 13 American Indian/Alaska Native organizations.<sup>223</sup> Since about 15% of the US population is without health insurance, the NBCCEDP program likely has contributed to the 18% increase in mammography use among women over age 50 since the program's inception in 1991. About 50% of the women screened have been from racial/ethnic minority groups. Nearly 5.8 million screening tests have diagnosed about 22,878 breast cancers, 76,921 precancerous cervical lesions, and 1,502 cases of invasive cervical cancer.<sup>223</sup> The CDC estimates that the program is currently reaching approximately 20% of eligible women, aged 50 to 64. Figure 3A shows the growth in numbers of low-income women served from 1991 to 2004. Since 2001, the program has consistently

**Table 3B. Mammography and Clinical Breast Exam, Women 40 and Older, by State, US, 2004**

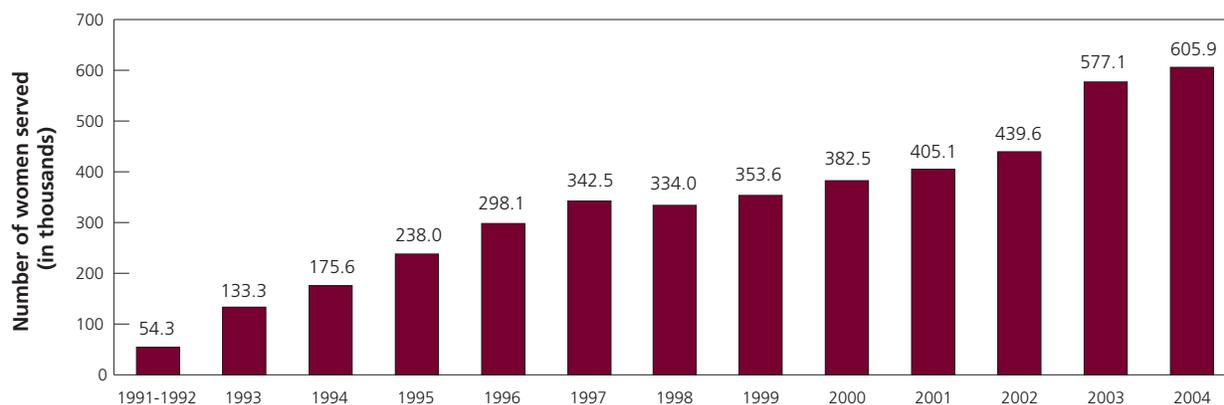
	% Recent Mammogram*					% Recent Mammogram and Clinical Breast Exam†				
	40 years and older	40 to 64 years	65 years and older	No usual source of medical care‡	No health insurance§	40 years and older	40 to 64 years	65 years and older	No usual source of medical care‡	No health insurance§
Alabama	60.3	58.6	64.1	36.4	34.2	52.7	53.7	50.4	29.9	27.4
Alaska	50.7	50.4	52.8	30.4	28.6	46.9	47.1	46.0	24.5	25.8
Arizona	56.7	52.4	65.4	27.3	35.9	48.9	46.8	53.3	19.9	30.2
Arkansas	51.0	50.6	51.9	27.3	29.0	44.4	44.8	43.4	21.4	25.4
California	57.8	55.0	64.5	34.4	34.9	46.8	46.4	47.8	22.2	31.2
Colorado	56.1	53.5	63.8	30.1	28.5	50.0	50.2	49.5	26.7	26.1
Connecticut	66.7	67.7	64.6	43.3	47.7	59.7	62.1	54.5	40.4	44.0
Delaware	69.7	68.8	71.8	33.4	46.4	63.9	64.9	61.8	28.1	40.3
Dist. of Columbia	63.0	62.6	63.9	39.9	41.3	56.3	58.3	51.9	30.6	36.0
Florida	60.5	56.0	68.3	28.9	27.7	53.6	52.0	56.3	25.7	23.2
Georgia	59.2	58.7	60.6	30.8	38.8	52.7	53.8	49.6	25.6	31.0
Hawaii	¶	¶	¶	¶	¶	¶	¶	¶	¶	¶
Idaho	47.7	45.4	53.1	22.3	21.7	43.0	42.6	44.1	18.4	20.2
Illinois	60.0	60.1	59.9	38.1	39.4	53.1	54.6	49.6	30.6	30.3
Indiana	52.8	52.4	53.6	25.6	30.0	45.2	47.1	40.9	21.4	28.1
Iowa	60.7	61.0	60.1	34.6	36.9	55.2	57.3	51.1	32.9	36.4
Kansas	63.1	62.3	64.7	33.1	30.5	57.1	58.2	54.7	29.7	28.3
Kentucky	59.8	61.4	56.0	36.7	32.3	52.6	55.1	46.3	31.4	29.7
Louisiana	60.0	59.5	61.5	38.4	39.2	51.8	52.8	48.9	33.2	33.5
Maine	64.1	63.8	64.8	32.6	40.9	58.8	59.2	57.8	26.4	34.1
Maryland	63.3	60.9	69.9	50.1	40.1	57.4	56.7	59.3	43.2	30.1
Massachusetts	68.4	69.5	66.3	33.3	51.8	61.4	64.4	55.2	29.7	47.4
Michigan	62.8	61.9	64.9	29.8	32.8	55.9	56.3	55.0	25.3	26.1
Minnesota	64.8	63.4	68.2	36.1	32.7	59.5	59.2	60.2	32.8	29.5
Mississippi	50.3	49.9	51.0	27.9	30.2	44.3	45.7	41.0	22.6	27.8
Missouri	52.3	50.3	56.5	21.3	21.2	45.4	45.9	44.2	16.2	15.9
Montana	56.4	53.0	64.2	28.4	32.7	50.1	48.5	53.7	23.5	29.3
Nebraska	62.2	62.3	62.0	39.1	41.8	55.5	58.1	50.2	34.8	35.8
Nevada	52.0	50.3	56.4	31.4	31.9	45.2	45.6	44.1	26.6	27.6
New Hampshire	64.8	63.7	67.4	28.5	33.7	58.5	60.0	54.8	23.8	30.9
New Jersey	60.2	60.3	60.0	31.4	35.7	53.2	55.5	48.3	27.7	32.7
New Mexico	53.0	51.8	56.2	25.1	25.3	46.0	46.2	45.6	21.9	22.4
New York	58.9	58.3	60.1	30.1	34.8	52.0	53.1	49.6	22.6	29.3
North Carolina	62.5	62.2	63.1	35.3	36.8	56.5	57.2	54.8	28.8	32.0
North Dakota	57.1	55.7	59.7	24.3	22.4	50.3	50.8	49.4	19.8	20.2
Ohio	58.5	55.3	65.3	28.5	33.7	51.3	49.8	54.8	25.8	31.1
Oklahoma	51.3	49.1	56.1	25.1	23.9	44.3	43.8	45.5	22.2	21.8
Oregon	57.3	55.9	60.4	22.8	25.4	49.0	49.8	47.2	18.8	22.9
Pennsylvania	55.5	56.0	54.5	23.3	34.8	47.7	50.2	42.9	17.6	23.5
Rhode Island	66.4	64.4	70.2	34.1	39.8	58.0	58.5	57.0	29.5	28.6
South Carolina	56.1	55.8	56.9	32.9	37.4	49.2	50.4	46.5	26.3	30.3
South Dakota	61.8	59.3	66.5	38.5	28.7	55.3	55.7	54.5	35.0	24.6
Tennessee	63.2	62.7	64.4	30.6	34.1	57.6	58.1	56.5	28.1	28.7
Texas	49.8	47.5	55.7	23.1	29.3	43.1	42.5	44.6	18.8	23.8
Utah	48.9	46.7	54.7	26.8	25.9	42.9	41.7	46.2	22.8	23.6
Vermont	59.2	59.6	58.4	26.9	40.2	51.8	53.6	47.3	22.6	34.0
Virginia	59.5	58.0	63.4	32.0	36.5	53.0	52.8	53.6	25.5	28.7
Washington	55.4	53.3	60.8	24.2	22.1	48.5	48.3	48.9	21.1	18.5
West Virginia	58.1	57.6	59.2	30.4	31.7	51.1	52.0	49.1	25.2	28.6
Wisconsin	59.4	55.9	66.7	34.4	42.1	54.4	53.4	56.7	29.1	40.3
Wyoming	51.6	48.8	58.8	27.5	25.9	45.3	45.5	44.9	22.8	22.0
United States#	58.3	56.8	61.7	30.7	32.9	51.1	51.4	50.3	24.7	28.0
Range	47.7-69.7	45.4-69.5	51.0-71.8	21.3-50.1	21.2-51.8	42.9-63.9	41.7-64.9	40.9-61.8	16.2-43.2	15.9-47.4

\*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. ¶Estimate not available as state did not participate in the 2004 survey. #See Statistical Notes for definition.

**Source:** Behavioral Risk Factor Surveillance System Public Use Data Tape 2004, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2005.

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**Figure 3A. Number of Women Served\* in the National Breast and Cervical Cancer Early Detection Program (NBCCEDP), 1991-2004†**



\*Served is defined as receiving at least one Program Pap test, mammogram, or clinical breast exam in the fiscal year. †In Fiscal Years.

Source: Minimum Data Elements through 06/30/2003 paid with NBCCEDP funds, National Breast and Cervical Cancer Early Detection Program, Centers for Disease Control and Prevention.

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served over 400,000 low-income women across the US. The Society has advocated for additional funding from Congress for the NBCCEDP to help expand its reach and increase access to breast and cervical cancer screenings and tests for low-income, uninsured, and underinsured women. The Society is also partnering with state health departments and other key organizations to drive best practices that will strengthen the NBCCEDP.

- The passage of the Breast and Cervical Cancer Prevention and Treatment Act, effective October 1, 2000, gave states the option to provide Medicaid coverage of medical assistance and follow-up treatment for women diagnosed with cancer through the NBCCEDP. Today, all 50 states and the District of Columbia have elected to provide this coverage.<sup>223</sup> Currently, the Society is working to ensure that state dollars supporting the treatment program are protected. Furthermore, the Society has begun collecting stories about women's real life experiences with this program through the National Cancer Information Center. By better understanding the needs of women in the community, barriers could be removed and the aims of this program achieved.
- On June 29, 2005, President George W. Bush, signed into law the Patient Navigator, Outreach, and Chronic Disease Prevention Act of 2005 (HR 1812/S 898). The American Cancer Society was the lead organization working with members of Congress and 20 national organizations for more

**Table 3C. Pap Test\*, Women 18 and Older, US, 2003**

Characteristic	%†
<b>Age (years)</b>	
18 to 20	63.7
21 to 29	83.9
30 to 39	87.3
40 to 49	86.1
50 to 59	81.1
60 to 64	75.7
65 to 85	61.0
<b>Race/ethnicity</b>	
White (non-Hispanic)	80.2
African American (non-Hispanic)	82.5
Hispanic/Latina	74.7
American Indian/Alaskan Native	86.0
Asian‡	68.4
<b>Education (years)§</b>	
11 or fewer	67.7
12	77.5
13-15	82.7
16 or more	87.3
<b>Health insurance coverage</b>	
Yes	82.2
No	61.0
<b>Immigration¶</b>	
Born in US	80.8
Born in US Territory	74.7
In US less than 10 yrs	63.7
In US 10+ years	73.3
<b>Total</b>	<b>79.3</b>

\*A Pap test within the past three years for all women over 18, irrespective of hysterectomy status. †Percentages are age-adjusted to the 2000 U.S. standard population. See Statistical Notes for more information. ‡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, 2003, National Center for Health Statistics, Centers for Disease Control and Prevention, 2005.

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**Table 3D. Pap Test, Women 18 and Older, by State, US, 2004**

	% 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	87.2	89.3	72.7	79.6	85.2
Alaska	88.7	89.5	75.6	74.5	79.1
Arizona	84.7	86.0	75.4	76.5	71.9
Arkansas	81.4	84.2	65.3	70.0	71.8
California	84.4	85.7	73.1	75.4	78.4
Colorado	87.8	89.7	69.6	81.9	76.4
Connecticut	87.7	90.5	72.8	81.4	86.3
Delaware	85.6	90.0	77.0	49.4	§
Dist. of Columbia	88.2	90.3	73.0	74.1	68.9
Florida	83.8	85.8	74.4	71.1	73.1
Georgia	87.5	89.4	68.9	80.7	78.5
Hawaii	¶	¶	¶	¶	¶
Idaho	78.1	80.3	58.4	70.3	72.1
Illinois	87.2	89.2	74.1	71.2	83.5
Indiana	82.1	85.2	62.0	71.0	73.6
Iowa	85.7	88.6	70.3	70.4	72.1
Kansas	86.1	88.9	70.0	76.2	75.4
Kentucky	84.4	87.1	66.8	75.3	77.0
Louisiana	85.0	86.9	66.6	73.5	78.2
Maine	88.6	90.8	75.4	68.2	77.5
Maryland	88.8	89.9	78.7	79.2	72.4
Massachusetts	89.1	91.5	76.3	71.3	78.5
Michigan	86.3	88.0	74.5	67.4	80.5
Minnesota	87.4	89.7	73.8	71.9	73.4
Mississippi	83.9	86.8	61.4	76.4	79.2
Missouri	84.3	87.7	64.4	69.2	75.1
Montana	86.0	87.4	76.9	79.7	79.2
Nebraska	85.7	88.4	68.2	77.2	81.1
Nevada	84.9	86.5	68.9	79.9	79.2
New Hampshire	89.8	91.9	74.8	81.2	78.9
New Jersey	84.3	87.5	66.6	77.3	77.2
New Mexico	84.3	86.1	70.8	70.4	73.3
New York	85.3	88.2	69.1	72.8	76.2
North Carolina	88.2	89.7	76.9	76.9	79.4
North Dakota	82.8	85.5	68.4	70.9	74.5
Ohio	86.1	88.4	73.3	77.6	78.2
Oklahoma	82.5	84.9	64.4	73.5	74.6
Oregon	83.4	85.7	67.4	71.8	70.4
Pennsylvania	84.1	87.3	67.5	71.4	73.2
Rhode Island	88.9	91.4	76.1	72.9	74.7
South Carolina	86.9	89.1	71.0	77.5	84.1
South Dakota	86.8	89.7	71.7	74.1	77.4
Tennessee	86.9	89.3	69.5	72.9	76.6
Texas	81.8	82.9	71.8	73.4	76.4
Utah	77.4	78.2	68.2	61.5	65.3
Vermont	87.4	91.0	66.0	74.6	78.3
Virginia	87.1	88.5	76.5	77.7	81.8
Washington	85.1	87.1	67.8	71.9	74.5
West Virginia	82.2	85.6	64.6	73.8	76.9
Wisconsin	85.5	88.1	69.4	73.0	75.1
Wyoming	85.4	87.8	68.0	76.1	78.3
United States#	85.2	87.3	71.2	74.2	76.9
Range	77.4-89.8	78.2-91.9	58.4-78.7	49.4-81.9	65.3-86.3

\*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. ¶Estimate not available as state did not participate in 2004 survey. #See Statistical Notes for definition.

Source: Behavioral Risk Factor Surveillance System Public Use Data Tape 2004, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2005.

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than three years on this critical piece of legislation. The bill will provide grants to set up navigator programs to help alleviate the barriers to quality health care that millions of medically underserved individuals often face. This law will improve access to prevention screenings and other services, such as breast and cervical cancer screening, diagnosis, and treatment, and will encourage increased screening participation of women who lack a usual source of care or who otherwise have difficulty navigating the health care system.

### Colon and Rectum Cancer Screening

Promoting colorectal cancer screening is a major strategy for the American Cancer Society because it can reduce death from colorectal cancer by detecting the disease at early, more treatable stages. There is a 90% chance of survival five years beyond diagnosis if a patient is diagnosed at the earliest, most treatable stage.<sup>1</sup> However, only 39% of cases are diagnosed at an early stage.<sup>1</sup> Colorectal cancer is one of the few cancers that can also be prevented through screening because it can identify precancerous polyps, from which colon cancers often develop, and they can be removed.<sup>214,224</sup> Of the 55,170 people expected to die of colorectal cancer in 2006, appropriate testing could save more than half.<sup>225</sup>

Several available screening tests (i.e., the fecal occult blood home-test kit [FOBT], endoscopy procedures such as the flexible sigmoidoscopy or colonoscopy, and radiological imaging with double-contrast barium enema) can be effective in detecting colorectal cancer and adenomatous polyps.<sup>214,224</sup> Despite the availability of these screening methods and their lifesaving potential, colorectal cancer screening is underutilized.<sup>226,227</sup> From 1987 to 2000, the use of a colorectal cancer screening test (either a FOBT within the last year or a colorectal endoscopic procedure within the last three years) by US adults aged 50 and older increased by 12% (from 27% to 39%).<sup>216</sup> Data from the CDC's Behavioral Risk Factor Surveillance System indicate

some increases in the use of colorectal cancer screening tests from 1997 to 2001.<sup>228</sup> While FOBT rates decreased slightly between 1999 and 2004 (from 20% to 18.5%), most of the increase in screening has been in the use of endoscopic procedures, which has increased by 12.1 percentage points in the same time period (from 33% to 45.1%).<sup>228</sup>

Current data show that 42.2% of US adults aged 50 years and older had either a home-test FOBT within the past year or a colorectal endoscopic procedure within the last five years (Table 3E). The prevalence in the use of specific tests for colorectal cancer screening among this population vary by gender, race, education, health insurance coverage, and immigration status. Utilization is lowest among those without health insurance, recent immigrants, those with less than a high school education, Hispanics, and immigrants who have been in the US for more than 10 years.

Across the states surveyed in 2004, the recent FOBT percentages for adults aged 50 and older ranged from 10.1% in Alaska to 28.5% in North Carolina (Table 3F). Recent (within the past 5 years) screening with sigmoidoscopy or colonoscopy ranged from 35.7% in Oklahoma to 56.9% in Minnesota. In general, adults aged 65 years and older were more likely to have had a colorectal cancer screening test compared to those between the ages of 50 and 64. The prevalence of colorectal cancer screening was even lower for adults 50 years of age and older who lack a usual source of care or who were uninsured. An American Cancer Society study confirmed that lack of access to a usual source of care, as well as other socioeconomic factors such as low educational attainment and lack of health insurance, were associated with under-utilization of colorectal cancer screening.<sup>227</sup>

As part of the goal to lower cancer incidence and mortality among minority and other medically underserved populations, the Society successfully advocated for federal legislation to fund a CDC pilot program for colorectal cancer screening and treatment in medically underserved communities. The first 5 pilot sites were recently selected. Grantees will have the flexibility to explore new ways of delivering screening

and treatment that meet the needs of their communities. Similar programs are being explored at the state level. New York and Maryland have implemented colorectal cancer screening programs for the uninsured and underserved that are improving access to needed services.

Lack of insurance coverage for the full range of colorectal cancer screening tests may contribute to low utilization of these tests. It is very difficult to determine the extent to which insurers are covering screening tests according to American Cancer Society guidelines, because plans often consider such information proprietary. There can also be confusion about which specific tests are covered; whether coverage is available for true screening or limited to diagnostic purposes; or whether the full range of tests is available to those at average risk or limited to those at high risk. Limited data currently available

**Table 3E. Colon and Rectum Cancer Screening, Adults 50 and Older, US, 2003**

Characteristic	% Fecal Occult Blood Test*§	% Endoscopy†§	% Combined Endoscopy/FOBT*§
<b>Gender</b>			
Male	16.6	39.1	45.2
Female	15.5	33.2	39.9
<b>Race/ethnicity</b>			
White (non-Hispanic)	16.3	37.5	44.2
African American (non-Hispanic)	16.4	32.6	38.9
Hispanic/Latino	11.9	25.1	29.9
American Indian/Alaskan Native¶	14.4	24.7	30.0
Asian#	14.4	24.8	29.7
<b>Education (years)</b>			
11 or fewer	11.3	25.2	30.3
12	15.1	33.5	40.2
13 to 15	17.9	38.6	45.7
16 or more	20.3	47.1	54.0
<b>Health insurance coverage</b>			
Yes	16.7	37.3	44.0
No	5.1	13.9	17.1
<b>Immigration**</b>			
Born in US	16.4	36.6	43.3
Born in US Territory	14.6	35.4	38.9
In US less than 10 years	10.3	19.8	26.3
In US 10 years or more	12.7	30.9	35.4
<b>Total</b>	<b>15.9</b>	<b>35.8</b>	<b>42.2</b>

\*A fecal occult blood test within the past year. †An endoscopy (tests include sigmoidoscopy, colonoscopy, or proctoscopy) within the past five years. ‡Either a fecal occult blood test within the past year or an endoscopy within the past five 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 samples 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.

**Note:** Preliminary estimates subject to adjustment based on official statistics released by NCHS.

**Source:** National Health Interview Survey Public Use Data File, 2003, National Center for Health Statistics, Centers for Disease Control and Prevention, 2005.

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**Table 3F. Colon and Rectum Cancer Screening, Adults 50 and Older, by State, US, 2004**

	% Recent Fecal Occult Blood Stool Test*					% Recent Sigmoidoscopy or Colonoscopy†					2004 Combined FOBT/ Endoscopy**
	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	17.4	16.5	18.5	9.6	10.5	42.3	36.4	49.8	23.5	23.1	48.4
Alaska	10.1	9.1	13.1	6.4	2.8	40.9	36.0	55.6	25.1	15.2	44.3
Arizona	22.0	18.3	26.4	10.7	13.5	42.2	33.1	53.1	17.5	23.5	51.4
Arkansas	16.5	11.9	22.1	9.4	8.5	37.4	28.9	47.8	15.4	18.6	44.1
California	14.7	10.5	20.4	4.8	1.8	43.0	36.8	51.6	19.3	11.4	48.3
Colorado	22.7	17.8	31.0	5.4	13.2	41.3	36.1	50.0	16.2	12.0	50.8
Connecticut	21.8	18.6	25.8	6.3	7.5	55.7	50.4	62.4	26.2	27.7	61.5
Delaware	18.2	14.7	22.7	9.2	12.7	53.7	47.4	62.0	24.8	22.2	58.6
Dist. of Columbia	27.3	26.8	28.0	18.0	15.2	54.8	49.3	62.3	32.5	17.4	60.8
Florida	22.3	17.6	26.9	9.4	15.1	49.3	39.9	58.7	19.9	23.6	56.5
Georgia	18.2	17.5	19.3	13.1	13.5	43.9	40.6	49.4	17.0	32.1	50.5
Hawaii	¶	¶	¶	¶	¶	¶	¶	¶	¶	¶	¶
Idaho	13.3	12.4	14.5	2.8	10.8	37.8	30.9	47.9	14.4	10.1	43.3
Illinois	17.3	15.3	19.9	2.6	9.3	39.2	35.1	44.5	9.8	18.2	46.5
Indiana	16.3	14.8	18.3	3.7	7.9	39.9	34.6	47.1	13.6	15.6	46.8
Iowa	21.2	18.7	24.1	7.1	3.0	44.0	38.5	50.6	19.4	12.2	53.1
Kansas	21.8	18.7	25.5	10.0	11.0	41.6	38.1	46.0	19.4	24.9	51.0
Kentucky	17.7	15.7	20.6	9.6	13.2	40.3	35.7	46.8	18.1	15.8	46.9
Louisiana	20.5	18.4	24.0	15.0	10.8	38.4	32.6	47.6	21.3	18.1	47.5
Maine	28.3	23.5	34.6	21.0	17.1	50.6	44.6	58.5	20.9	19.9	61.8
Maryland	21.7	17.6	28.6	6.2	7.9	54.5	49.4	63.1	19.5	18.2	60.3
Massachusetts	23.7	21.5	26.5	8.7	13.7	54.1	51.4	57.5	15.0	28.2	61.4
Michigan	20.2	17.6	23.7	7.0	5.2	50.5	44.6	58.3	18.5	22.6	57.0
Minnesota	17.0	14.1	21.0	6.9	8.2	56.9	52.0	63.5	30.2	19.1	61.2
Mississippi	14.1	13.2	15.3	9.7	12.6	37.2	33.9	41.7	17.5	16.8	42.5
Missouri	15.1	11.8	19.4	8.5	7.5	43.1	38.4	49.0	17.5	23.0	49.6
Montana	18.8	16.3	22.2	10.8	10.7	41.8	33.4	53.3	19.1	16.4	49.5
Nebraska	20.3	16.4	25.1	11.1	14.6	37.1	32.8	42.3	21.4	25.0	46.7
Nevada	16.5	12.7	21.9	2.7	1.5	36.7	31.1	44.6	17.2	22.3	44.4
New Hampshire	24.6	22.6	27.6	10.8	9.8	53.2	49.9	58.0	22.6	26.4	61.9
New Jersey	17.4	15.5	19.8	8.1	10.2	49.1	45.1	54.2	23.3	26.8	53.9
New Mexico	18.3	16.1	21.5	8.9	6.9	41.3	36.7	47.7	17.7	19.0	49.1
New York	18.0	15.7	20.9	8.6	11.6	47.6	42.2	54.7	17.3	19.7	53.6
North Carolina	28.5	26.1	31.8	14.7	12.7	48.7	43.0	56.5	23.0	20.1	57.7
North Dakota	12.9	12.1	13.8	4.7	5.5	43.2	35.0	52.3	17.1	20.4	47.4
Ohio	16.5	15.6	17.6	5.5	13.6	45.1	38.3	53.8	22.4	12.9	50.3
Oklahoma	17.2	14.3	21.0	7.1	6.8	35.7	29.8	43.4	15.5	11.2	43.2
Oregon	19.9	17.4	23.4	4.8	5.5	44.4	38.9	52.0	14.5	15.7	51.4
Pennsylvania	16.6	12.6	20.9	7.4	7.7	44.4	39.7	49.7	15.1	13.8	51.0
Rhode Island	22.6	17.9	28.2	14.1	13.1	56.0	52.4	60.3	18.7	24.1	64.6
South Carolina	17.0	14.7	20.2	6.9	12.5	46.8	43.0	52.2	17.5	18.9	52.3
South Dakota	18.4	16.2	21.0	12.1	8.6	42.8	33.7	53.6	22.1	14.6	50.6
Tennessee	20.7	18.5	23.8	9.1	8.1	44.9	38.0	54.6	20.2	18.7	52.3
Texas	15.4	12.4	20.1	6.7	5.4	38.9	34.0	46.4	19.6	13.5	45.1
Utah	15.1	12.0	20.0	7.4	8.7	44.5	39.3	52.6	18.9	18.7	50.1
Vermont	19.3	16.7	23.0	5.6	9.3	49.6	46.6	54.0	15.8	22.8	57.4
Virginia	18.3	17.0	20.2	6.8	14.0	51.5	48.0	56.9	25.3	32.9	57.3
Washington	22.5	19.9	26.5	7.4	10.3	47.1	41.1	56.4	17.9	23.2	54.5
West Virginia	19.8	18.7	21.2	8.9	12.2	37.3	34.6	40.7	16.2	18.9	46.6
Wisconsin	19.5	13.3	27.1	9.7	12.2	50.3	42.2	60.3	20.5	30.8	56.1
Wyoming	12.5	11.3	14.4	5.5	8.6	37.1	30.9	47.0	16.6	17.9	43.1
United States#	18.5	15.7	22.4	7.7	9.1	45.1	39.5	52.6	19.1	18.6	51.8
Range	10.1-28.5	9.1-26.8	13.1-34.6	2.6-21.0	1.5-17.1	35.7-56.9	28.9-52.4	40.7-63.5	9.8-32.5	10.1-32.9	42.5-64.6

\*A fecal occult blood test within the last year. †A sigmoidoscopy or colonoscopy within the preceding five years. ‡Adults 50 and older who reported that they did not have a personal doctor or health care provider. §Adults 50 to 64 who reported that they did not have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare. ¶Estimate not available as state did not participate in 2004 survey. #See Statistical Notes for definition. \*\*A fecal occult blood test within the last year or a sigmoidoscopy or colonoscopy within the preceding five years. Note: The colorectal cancer screening prevalence estimates do not distinguish between examinations for screening or diagnosis.

Source: Behavioral Risk Factor Surveillance System Public Use Data Tape 2004, National Center for Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2005.

American Cancer Society, Surveillance Research

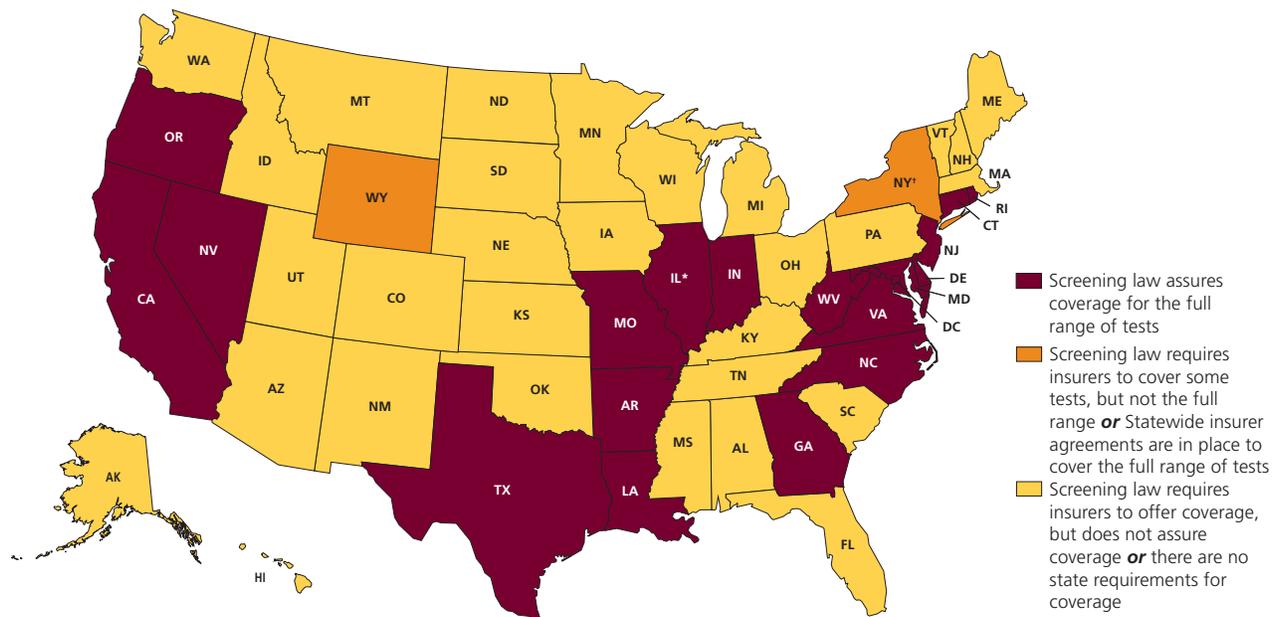
suggests that many plans do not cover the full range of screening tests, and many do not cover screening colonoscopy for those at average risk.<sup>229,230</sup> In addition, very few health plans have all three essential CRC screening delivery components – coverage, guidelines and tracking systems – in place.<sup>230</sup>

Improving insurance coverage for colorectal cancer screening is a high priority for the American Cancer Society. The Society has advocated at both state and federal levels for legislation to ensure that private health insurance plans cover the full range of screening methods available which can be done for little or no additional cost.<sup>231</sup> To date, these efforts have been successful in 18 states and the District of Columbia (Figure 3B). Unfortunately, there have been attempts to pass legislation that will allow insurers to circumvent these laws, which the Society actively opposes.

In addition, the Society has worked with the federal Office of Personnel Management to increase the proportion of health plans offered to federal employees that cover the full range of colorectal cancer screening tests. Currently, almost 80% of these health plans indicate that they do offer such coverage, which means that over 8 million federal enrollees and their dependents have access to these lifesaving tests.

The American Cancer Society is also collaborating with the Centers for Medicare & Medicaid Services (CMS) to help CMS improve colorectal cancer screening among the 40 million Medicare beneficiaries. As a result of the Society’s efforts, CMS has designated colorectal cancer screening as a “breakthrough priority.” With 69% of newly diagnosed cases of colorectal cancer occurring in persons aged 65 and older, Medicare has a substantial opportunity to slow the toll of this disease. CMS will be leveraging resources across the agency to promote a wide range of interventions, including communicating with beneficiaries who are due for screening; informing physicians about Medicare colorectal cancer screening coverage; and considering colorectal cancer screening quality measures. Since 2001, Medicare has covered all Society-recommended colorectal cancer screening options. Furthermore, since January 1, 2005, Medicare has covered an initial preventive physical exam for all new Medicare beneficiaries within 6 months of enrolling in Medicare. The “Welcome to Medicare” exam includes measurements of height, weight, and blood pressure, in addition to referrals for prevention and early detection services already covered under Medicare, such as colorectal cancer screening.

**Figure 3B. Colon and Rectum Cancer Screening Coverage Legislation, by State, US, 2005**

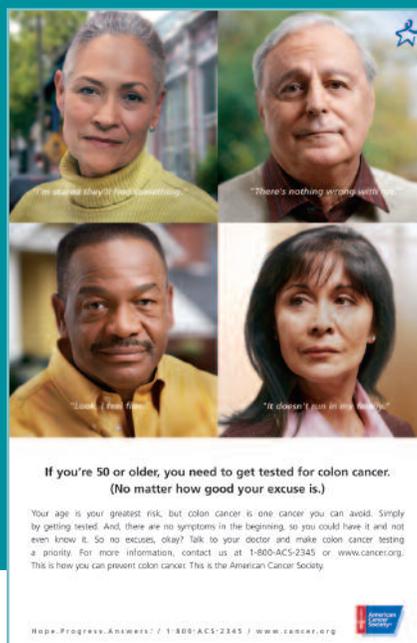


\*In 2003, Illinois expanded its 1998 law to cover the full range. †The New York Health Plan Association, which serves 6 million New Yorkers, covers the full range of colorectal cancer screening tests, as a part of a voluntary collaborative with the Society.

**Sources:** Health Policy Tracking Service & Individual state bill tracking services. Provided by National Government Relations Department, American Cancer Society. November 2005.

Also of note are recent strategies by the federal government, private nonprofit organizations, and the American Cancer Society that aim to raise awareness of colorectal cancer screening and to remove existing obstacles to early detection.

- The American Cancer Society is conducting a nationwide advertising campaign encouraging people 50 and older to talk to their doctor about colorectal cancer testing and to call the Society for a free colorectal cancer information kit, which includes a list of questions to ask a doctor and a video that discusses different testing options.
- The CDC's *Screen for Life* awareness campaign helps educate the public and health care providers about the importance of colon cancer screening.<sup>232</sup> In addition, the CDC conducts research on nationwide capacity for colorectal cancer screening, strategies to increase use of colorectal cancer screening rates and works with its national partners (including the Society) to raise colorectal cancer awareness.
- The National Colorectal Cancer Roundtable (NCCRT) is a national coalition of public, private, and voluntary organizations co-founded by the American Cancer Society and the CDC, whose mission is to advance colorectal cancer control efforts by improving communication, coordination, and collaboration among health agencies, medical-professional organizations, and the public. The roundtable has been conducting research to answer key policy questions surrounding colorectal cancer issues that will ultimately help us promote colorectal cancer screening in more effective and strategic ways.
- In 2000-2001, the American Cancer Society funded colorectal cancer screening interventions in 185 primary care practices in three states (New Hampshire, Massachusetts, and Connecticut). In the intervention model, clinics adopted office-based systems to facilitate routine monitoring of patients' colorectal screening and used trained facilitators, who were American Cancer Society volunteers, to assist medical providers in educating and promoting patients' compliance with screening tests through the use of educational tool kits. This intervention proved that it is possible to improve colorectal cancer screening rates in primary care practices. Findings showed that at baseline, just 20.5% of physicians displayed posters or brochures about colorectal screening in the waiting or examination rooms. By the end of the intervention, however, 69.3% did. At baseline, only 15% of providers actively distrib-



American Cancer Society "No Excuses" print advertisement encouraging people 50 or older to get tested for colorectal cancer.

uted educational brochures to patients; at follow up, that number had increased to 43.3%. While nearly all clinicians (96%) said they discussed colorectal screening with patients at baseline, the intervention increased the number of staff members who also had this discussion with patients, from 20.5% to 36.2%. The percentage of clinicians who advised asymptomatic patients to use a home FOBT increased from 85% to 89%, and the percentage of those who monitored compliance with FOBT increased from 26.5% to 52%. The researchers attributed this latter improvement directly to the intervention, as the ACS facilitators helped offices set up effective manual tracking systems.<sup>233</sup>

- The American Cancer Society has also launched an aggressive outreach effort aimed at physicians and other health care providers to educate them about their crucial role in getting patients screened for colorectal cancer. This health care provider outreach includes advertisements in medical journals, a direct email campaign, physician office detailing (in select markets), and working with health plans to reach their contracted providers. A variety of patient education tools have been developed and will be available through the Society to assist physicians in their efforts to increase screening in their practices. Information on activities of the American Cancer Society to foster greater participation in colorectal cancer screening can be found in the recently released *Colorectal Cancer Facts & Figures, Special Edition 2005* (available at [http://www.cancer.org/docroot/STT/content/STT\\_1x\\_Colorectal\\_Cancer\\_Facts\\_and\\_Figures\\_-\\_Special\\_Edition\\_2005.asp](http://www.cancer.org/docroot/STT/content/STT_1x_Colorectal_Cancer_Facts_and_Figures_-_Special_Edition_2005.asp))

## 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. Although declining mortality trends for prostate cancer suggest a benefit from testing for early detection, most experts agree that the evidence currently is insufficient to recommend for or against screening for prostate cancer with the prostate-specific antigen (PSA) blood test or the digital rectal exam (DRE).<sup>214</sup> The US Preventive Services Task Force, the American Cancer Society, the American Academy of Family Physicians, the American College of Physicians-American Society of Internal Medicine, the American Medical Association, and the American Urological Association recommend that for men age 50 and older and men at higher risk of prostate cancer, clinicians discuss with patients the potential benefits and possible harm of PSA screening, consider patient preferences, and individualize the decision to screen.<sup>214,234,235</sup> The American Cancer Society recommends that the PSA test and the DRE be offered annually to men over age 50, and that prior to testing, they should be informed about the benefits and limitations of testing for early prostate cancer detection. Men at high risk, including men of African descent and men with a first-degree relative diagnosed with prostate cancer at a young age, should begin screening at age 45 and should also be informed about the benefits and limitations of testing before being tested.

In 2003, the prevalence of PSA screening in men aged 50 and older within the past year was 57.6% (Table 3G), compared to 41.0% in 2000.<sup>216</sup> Men least likely to be tested were those who had no usual source of care or health insurance (33.7%), followed by those with less than a high school education (49.6%). Among screened men, in 2000, 66.5% of elderly men and 67% of men aged 50 to 74 years old reported having a discussion about the advantages and disadvantages of the test with their doctor before PSA testing.<sup>236</sup> The same detailed questions around informed decision-making on PSA testing are not available on the Behavioral Risk Factor Surveillance System. Across states (Table 3H), the recent PSA test percentages in 2004 for men aged 50 and older ranged from 42.8% in Oregon to 61.2% in Florida. The recent DRE percentages in 2004 for men aged 50 and older ranged from 33.5% in Wyoming to 62.9% in Connecticut. Unlike the PSA percentages, there was little variability in these proportions by age. Across all states, men aged 50 years and older who lack a usual source of

**Table 3G. Prostate Cancer Screening, Men 50 and Older, US, 2003**

Characteristic	% PSA in the past year**
<b>Race/ethnicity</b>	
White (non-Hispanic)	58.0
African American (non-Hispanic)	55.6
Hispanic/Latino	52.7
American Indian/Alaskan Native†	78.2
Asian§	51.3
<b>Education (years)</b>	
11 or fewer	49.6
12	54.5
13 to 15	59.4
16 or more	63.5
<b>Health insurance coverage</b>	
Yes	58.7
No	33.7
<b>Immigration**</b>	
Born in US	57.6
Born in US Territory†	68.7
In US less than 10 yrs‡	55.3
In US 10+ years	56.4
<b>Total</b>	<b>57.6</b>

\*Percentages are age-adjusted to 2000 U.S. standard population. See Statistical Notes for more information. †A prostate-specific antigen test within the last year for men 50 and older who did not report that they had ever been diagnosed with prostate cancer. ‡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. Individuals born in a US territory have been in the US for any length of time.

**Note:** Preliminary estimates subject to adjustment based on official statistics released by NCHS.

**Source:** National Health Interview Survey Public Use Data File 2003, National Center for Health Statistics, Centers for Disease Control and Prevention, 2005.

American Cancer Society, Surveillance Research

care and uninsured men, aged 50-64 years, were significantly less likely to have had a recent PSA or DRE.

## Barriers and Opportunities to Improve Cancer Screening

Studies document that people who lack health care insurance have reduced access to preventive care and are less likely to get timely cancer screening examinations.<sup>237</sup> In persons aged 65 and older, health insurance coverage is nearly universal because of the Medicare program.<sup>238</sup> However, among adults under age 65 in 2004, 21% had no health insurance coverage, only 7% had Medicaid coverage, and 69% had employer-sponsored coverage.<sup>239</sup> The uninsured were more likely to be at or below the poverty level, be Hispanic or African-American and report lower education.<sup>237</sup> Changes in employment status can also affect health care coverage.<sup>238</sup> Despite recent

**Table 3H. Prostate Cancer Screening, Men 50 and Older, by State, US, 2004**

	% 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	50.9	50.4	51.7	25.3	¶	45.6	44.1	48.3	19.0	¶
Alaska	45.2	44.8	46.4	28.2	9.6	45.4	42.7	54.7	31.4	27.6
Arizona	49.6	42.0	60.6	18.5	10.2	48.0	44.9	52.5	20.4	15.0
Arkansas	48.2	44.4	54.3	21.7	23.9	41.9	36.0	51.9	17.7	19.1
California	49.9	42.9	62.4	19.4	18.2	43.2	38.2	52.3	15.6	13.4
Colorado	52.0	46.3	64.8	18.3	21.2	52.4	47.1	64.2	18.8	26.1
Connecticut	57.5	51.3	67.7	31.6	32.5	62.9	58.1	70.8	33.3	27.4
Delaware	59.5	52.2	71.0	12.3	¶	53.1	48.1	60.9	15.7	¶
Dist. of Columbia	52.8	50.7	56.7	18.6	¶	53.6	52.7	55.2	21.9	¶
Florida	61.2	53.1	71.0	23.2	36.2	55.2	48.9	62.6	22.1	20.6
Georgia	57.3	55.0	62.6	30.8	45.1	53.5	53.1	54.4	33.7	37.4
Hawaii	#	#	#	#	#	#	#	#	#	#
Idaho	44.5	38.2	55.9	18.6	18.9	40.8	36.9	47.7	16.2	19.0
Illinois	51.4	46.6	59.7	18.4	¶	48.4	44.7	54.5	7.2	¶
Indiana	48.0	42.6	58.0	14.7	22.2	44.5	39.3	54.0	14.6	21.6
Iowa	56.2	48.7	67.5	24.4	¶	50.9	46.7	57.4	24.1	¶
Kansas	53.7	48.2	62.5	20.1	25.6	49.4	45.1	56.2	18.7	25.7
Kentucky	52.2	44.5	66.5	22.2	35.4	47.5	40.7	60.1	22.3	32.0
Louisiana	53.9	48.1	65.0	23.0	26.3	46.2	41.5	55.3	21.5	20.5
Maine	46.8	41.9	55.0	22.9	13.1	60.0	57.8	63.6	26.7	30.8
Maryland	54.4	51.0	61.4	29.1	¶	57.1	54.3	62.8	24.4	¶
Massachusetts	54.3	50.7	60.5	14.5	34.5	62.3	59.8	66.4	21.9	35.4
Michigan	56.5	51.9	64.8	21.6	¶	53.5	52.1	56.1	22.4	¶
Minnesota	45.0	38.1	57.3	19.6	¶	48.6	43.7	57.2	27.6	¶
Mississippi	49.2	43.1	60.1	28.8	28.5	42.1	40.2	45.4	25.6	24.7
Missouri	47.1	38.6	61.1	13.0	26.8	40.3	34.7	49.8	10.9	24.9
Montana	56.2	51.5	64.6	37.2	35.9	53.5	48.4	62.5	28.3	34.1
Nebraska	51.4	45.3	61.6	24.4	35.1	44.6	41.0	50.7	17.6	26.0
Nevada	48.9	43.3	58.5	18.0	16.6	38.4	33.6	46.7	10.1	12.9
New Hampshire	52.0	48.0	59.8	16.4	21.2	59.2	56.5	64.5	16.7	19.0
New Jersey	57.4	52.6	65.4	26.6	23.5	53.1	49.9	58.6	23.7	17.8
New Mexico	49.6	43.5	60.1	17.2	21.9	51.4	45.9	60.8	15.0	20.4
New York	52.8	48.0	61.1	26.3	30.0	50.3	47.4	55.3	19.2	26.5
North Carolina	57.4	51.7	67.7	29.2	24.4	54.5	50.7	61.5	25.6	23.3
North Dakota	44.2	38.9	52.1	15.0	¶	43.5	40.7	47.9	14.5	¶
Ohio	52.7	45.6	64.2	21.2	29.5	52.1	47.8	59.3	22.7	25.0
Oklahoma	48.8	42.7	60.0	19.2	14.5	43.9	40.2	50.6	17.7	16.7
Oregon	42.8	38.2	50.8	11.8	15.5	43.3	36.7	55.0	16.5	20.2
Pennsylvania	50.3	42.7	61.4	16.3	21.1	46.0	41.1	53.3	16.6	18.0
Rhode Island	56.5	52.0	63.5	21.2	¶	62.1	61.1	63.6	16.1	44.3
South Carolina	52.8	49.5	59.1	28.4	27.7	51.2	51.3	51.0	28.4	32.9
South Dakota	53.0	45.6	64.1	24.6	24.2	49.6	43.4	58.8	21.6	24.8
Tennessee	53.1	47.6	63.3	34.1	¶	51.7	48.4	57.7	19.9	¶
Texas	51.1	46.1	60.7	20.3	13.3	45.1	41.7	51.7	17.3	15.2
Utah	49.3	42.0	63.3	29.5	43.1	44.6	41.6	50.4	26.2	34.6
Vermont	43.8	38.2	54.2	11.2	26.3	48.8	44.6	56.6	13.0	27.5
Virginia	54.3	50.9	60.7	20.7	40.1	56.3	53.6	61.4	31.1	46.4
Washington	45.3	41.1	53.6	20.2	25.4	50.0	47.5	55.1	22.1	29.2
West Virginia	53.3	49.2	60.3	23.4	¶	49.6	44.6	58.1	19.9	¶
Wisconsin	45.6	40.7	54.0	11.9	¶	51.2	48.2	56.4	25.4	¶
Wyoming	55.3	53.2	59.5	42.9	33.6	33.5	30.6	39.6	20.7	18.7
United States**	52.3	46.7	62.1	21.7	24.9	49.5	45.6	56.2	20.0	22.2
Range	42.8-61.2	38.1-55.0	46.4-71.0	11.2-42.9	9.6-45.1	33.5-62.9	30.6-61.1	39.6-70.8	7.2-33.7	12.9-46.4

\*A prostate-specific antigen test within the last year for men 50 and older who reported they were not told by a doctor, nurse, or other health professional they had prostate cancer. †A digital rectal exam within the last year for men 50 and older who reported they were not told by a doctor, nurse, or other health professional 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. #Estimate not available as state did not participate in 2004 survey.\*\*See Statistical Notes for definition.

**Source:** Behavioral Risk Factor Surveillance System Public Use Data Tape 2004, National Center for Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2005.

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efforts to expand coverage, the number of uninsured Americans has continued to grow, reaching 45.8 million in 2004, up 4.9 million from 2001.<sup>240,241</sup> Millions more face erosion in their coverage, higher deductibles, and periods without insurance.<sup>241</sup> According to a recent report, higher wage workers are more likely than their lower paid counterparts to have health insurance and health-related benefits, such as paid sick leave and preventive care services. Low-wage workers and uninsured persons are much more likely to delay or forgo needed health care because of cost and to report problems paying medical bills.<sup>175,242,243</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>175,244</sup> For example, studies have shown that people who received a clinician's recommendation for cancer screening are more likely to be screened than those who did not receive a recommendation.<sup>175</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, and organizational support systems to help manage referrals and follow up of cancer screening tests.<sup>175,245</sup> In addition, multiple interventions directed at patients (strategies to raise awareness about the importance of cancer screening), physicians (strategies to assist them in their cancer screening counseling and follow up), and



health care systems (strategies to ensure the delivery of high-quality and timely cancer screening) may provide the best approaches to improving rates of cancer screening.<sup>246,247</sup> Further, multipartner efforts between the American Cancer Society and government agencies are under way to implement interventions, integrate screening into routine care, and address health disparities. Visit [www.cdc.gov/nccdphp/aag/aag\\_reach.htm](http://www.cdc.gov/nccdphp/aag/aag_reach.htm) for more information.

The American Cancer Society continues to advocate for state and federal policy initiatives to promote and increase cancer screening among the uninsured. As more and more states develop innovative models to provide screenings and treatment for the uninsured, the American Cancer Society will play a larger role in advocating for and helping to replicate these programs.

# Statistical Notes

## Sample Surveys

In measuring the **prevalence** of certain behaviors in a **population**, it is usually costly and unfeasible to survey every person. Hence, most **population-based surveys** are conducted by choosing a randomly selected **sample** of people to estimate the true prevalence in a population. Such surveys are considered to have high external validity, and, therefore, results are considered applicable to the entire population that the sample represents. All of the adult 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 Floridian women aged 40 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 BRFSS data targets adults 18 and older, and the YRBSS data 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 the nation, a state, or a city.

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

**Weighted data:** Data that are representative of an entire city, state, or nation. Once the sample of the population

has completed the survey, statistical analyses are conducted to extrapolate the surveyed group's responses to the entire population (city, state, or nation). For example, BRFSS data in this publication is representative of all noninstitutionalized, civilian adults with telephones. The YRBSS data in this publication are representative of all public and private high school students in grades 9 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 0.8% and 2.4%. The narrowest confidence interval is around the percentage for Washington (19.2%±0.8%) or (18.4, 20.0), and the percentage for Alaska has the widest range of possible values (24.9%±2.4%) or (22.5, 27.3).

**Correlation:** Correlation quantifies the extent to which two independent quantities (variable X and Y) “go together.” When high values of X are associated with high values of Y, a positive correlation is said to exist. When high values of X are associated with low values of Y, a negative correlation is said to exist. The strength of a correlation between two variables, X and Y, is evaluated by using a statistical measure called the correlation coefficient. The p-value measures the likelihood that the observed association occurred by chance alone; p-values less than 0.05 are considered statistically significant (but unlikely that the association occurred by chance).

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

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

Table	Description	95% CI Range
1A	Current cigarette smoking, high school students, total	±1.8% to 6.2%
1B	At risk for becoming overweight, high school students, total	±0.7% to 2.4%
	Overweight, high school students, total	±1.4% to 3.5%
	Moderate physical activity, high school students, total	±1.6% to 3.9%
	Vigorous physical activity, high school students, total	±1.9% to 4.9%
	Five or more fruits and vegetables a day, high school students, total	±1.6% to 3.4%
2B	Current cigarette smoking, adults 18 and older	±0.8% to 2.4%
	Current cigarette smoking, men 18 and older	±1.2% to 3.8%
	Current cigarette smoking, women 18 and older	±0.9% to 3.0%
2C	Clinical overweight, adults 18 and older	±0.9% to 2.8%
	Clinical obese, adults 18 and older	±0.8% to 2.4%
	No leisure time physical activity, adults 18 and older	±0.7% to 2.5%
	Moderate physical activity, adults 18 and older	±0.9% to 2.9%
	Vigorous physical activity, adults 18 and older	±0.9% to 2.8%
	Five or more fruits and vegetables a day, adults 18 and older	±0.8% to 2.5%
3B	Recent mammogram, women 40 and older	±1.4% to 4.7%
	Recent mammogram, women 65 and older	±2.4% to 10.4%
3D	Recent Pap test, women 18 and older	±1.3% to 3.4%
	Recent Pap test, women 65 and older	±3.0% to 13.0%
3F	Recent fecal occult blood test, adults 50 and older	±1.1% to 3.1%
	Recent sigmoidoscopy or colonoscopy, adults 50 and older	±1.3% to 4.4%
3G	Recent prostate-specific antigen test, men 50 and older	2.2% to 6.9%
	Recent digital rectal examination, men 50 and older	±2.2% to 6.7%

**US definition for state tables:** The state-based BRFSS data were aggregated to represent the United States. Thus, the median BRFSS values for all US states/territories published by the 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 NHIS.

## Survey Sources

The statistics reported in this publication are compiled from several different publicly available surveys designed to provide prevalence estimates of health-related behaviors and practices for a city, state, or nation. The survey 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 (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 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 [www.cdc.gov/brfss](http://www.cdc.gov/brfss).

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

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

**National Youth Tobacco Survey (NYTS).** The NYTS is a survey of the CDC Foundation funded by the American Legacy Foundation. The survey is designed to provide national data for public and private students in grades 6 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 is conducted every other year.

**Youth Risk Behavior Surveillance System (YRBSS).** The YRBSS is a survey of the CDC, National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP). The survey is designed to provide national, state, and local prevalence estimates on health risk behaviors, such as tobacco use, unhealthy dietary behaviors, physical inactivity, and others, among youth and young adults who attend public and private high schools. Different statistical methods are used to choose the representative sample for the national, state, and local prevalence estimates (see Statistical Notes, page 46). 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 9 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 does 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 [www.cdc.gov/HealthyYouth/yrbs/index.htm](http://www.cdc.gov/HealthyYouth/yrbs/index.htm).

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