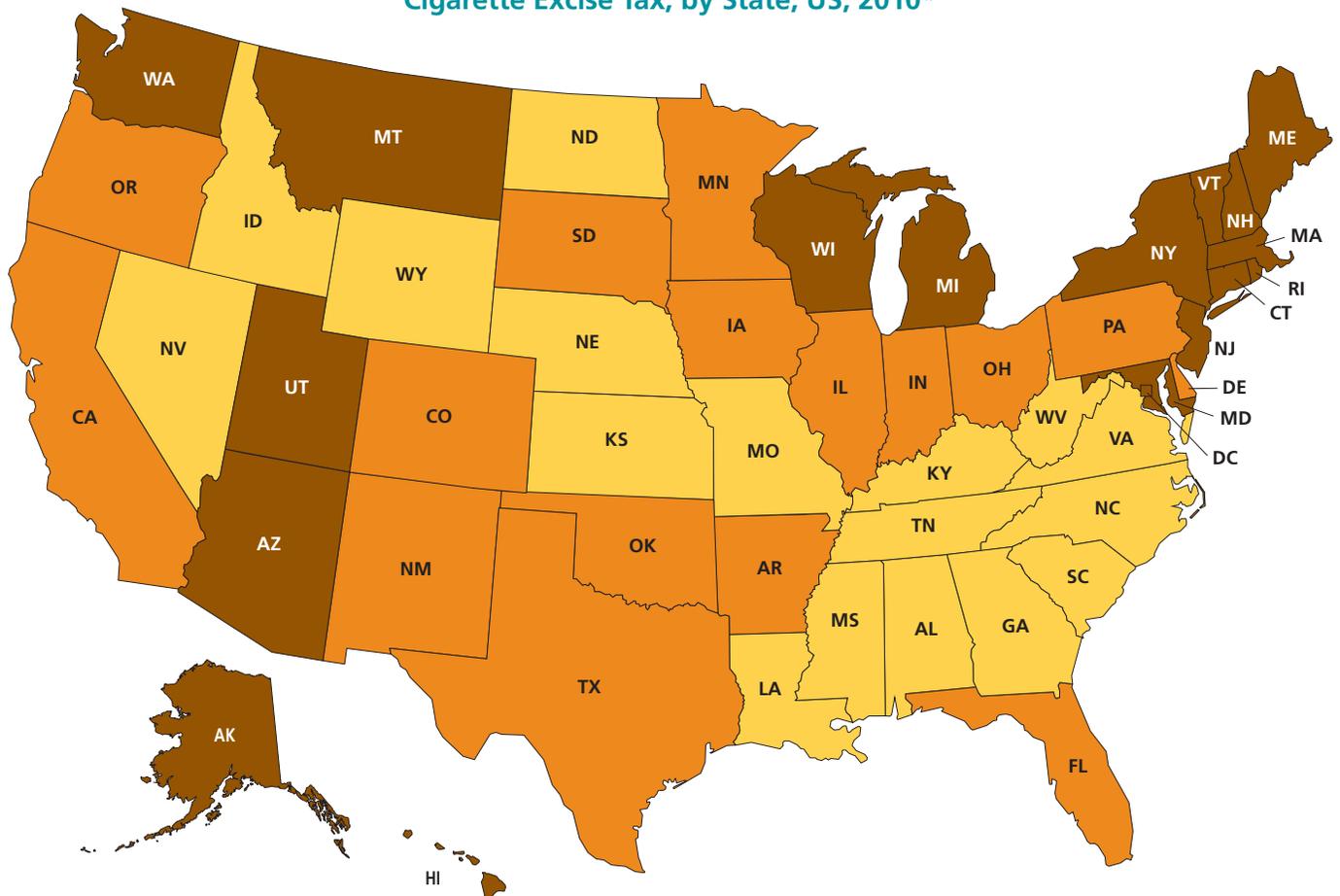


Cancer Prevention & Early Detection

Facts & Figures

2010

Cigarette Excise Tax, by State, US, 2010*

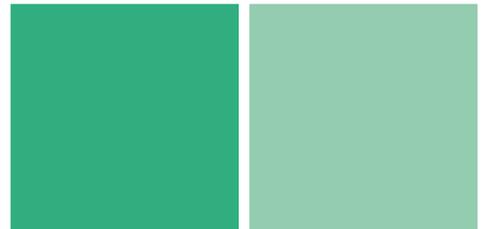
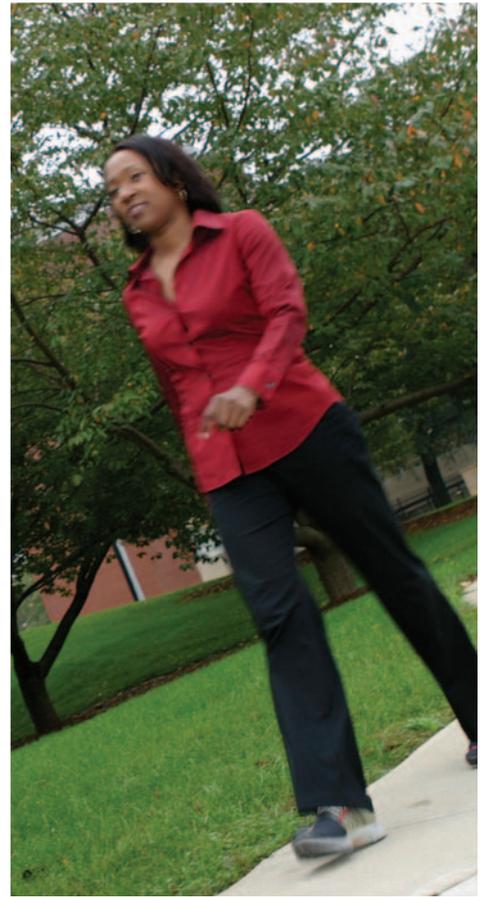


*Taxes in effect or increases passed, reported as of May 2010.
Source: American Cancer Society Cancer Action Network.

- Top third (greater than or equal to \$1.70)
- Middle third (between 82 cents and \$1.70)
- Bottom third (below 82 cents)

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*This publication attempts to summarize current scientific information about cancer.
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Preface

Much of the suffering and death from cancer could be prevented by more systematic efforts to reduce tobacco use, improve diet and physical activity, reduce obesity, and expand the use of established screening tests. The American Cancer Society estimates that in 2010 about 171,000 cancer deaths will be caused by tobacco use alone. In addition, approximately one-third (188,000) of the 569,490 cancer deaths expected to occur in 2010 are attributed to poor nutrition, physical inactivity, overweight, and obesity.¹⁻³ Regular use of some established screening tests can prevent the development of cancer through identification and removal or treatment of premalignant abnormalities; screening tests can also improve survival and decrease mortality by detecting cancer at an early stage when treatment is more effective.

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

Highlights, CPED 2010

Tobacco Use

- Even though adult smoking rates declined significantly in the past two decades, especially among non-Hispanic African Americans and Hispanics, socioeconomic disparities persisted.
- Smoking rates among adults have remained unchanged in the past 5 years (2008: 20.6%). Among youth, smoking prevalence did not change significantly between 2003 and 2007 (20%) among high school students, but smokeless products' use is increasing in some groups.
- Federal initiatives to control tobacco can help bolster state efforts. Recent federal initiatives, including FDA federal regulation of tobacco products, excise tax increases, and increases in federal funding for tobacco control, all hold promise for reducing tobacco use in the US.
- States' allocation for tobacco control fell by 15% between 2009 and 2010, including cuts in 32 states and the District of Columbia.
- Smokers in racial/ethnic minority groups and those without a regular source of medical care have disproportionately lower access to effective cessation treatments.

Overweight and Obesity, Physical Activity, and Nutrition

- The *American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention* highlight the importance of individual nutritional and physical activity choices for cancer prevention and community efforts to facilitate such choices.

- Currently, an estimated 18.1% of adolescents and 34.3% of adults are obese. Increasing rates of obesity observed since the early 1980s appear to have slowed in the past decade, particularly among women and girls.
- In 2008, the prevalence of obesity among adults exceeded 20% in all states except Colorado (19.3%).

HPV Vaccination for Cervical Cancer Prevention

- To prevent cervical cancer, vaccination against certain types of human papillomavirus (HPV) is recommended for adolescent girls. The initiation of the HPV vaccination series among US females aged 13 to 17 increased from 25% in 2007 to 37% in 2008, but fewer than one in four completed the entire series.

Cancer Screening

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

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

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

American Cancer Society Challenge Goals and Nationwide Objectives

2015 Challenge Goals

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

2015 Nationwide Objectives

Adult Tobacco Use

- Reduce to 12% the proportion of adults (18 and older) who are current cigarette smokers.
- Reduce to 0.4% the proportion of adults (18 and older) who are current users of smokeless tobacco.

Youth Tobacco Use

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

Nutrition & Physical Activity

- The trend of increasing prevalence of overweight and obesity among US adults and youth will have been reversed, and the prevalence of overweight and obesity will be no higher than it was in 2005.
- Increase to 70% the proportion of adults and youth who follow American Cancer Society guidelines with respect to the appropriate level of physical activity, as published in the *American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention*.

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

Comprehensive School Health Education

- Increase to 50% the proportion of school districts that provide a comprehensive or coordinated school health education program.

Sun Protection

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

Breast Cancer Early Detection

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

Colorectal Cancer Early Detection

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

Prostate Cancer Early Detection

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

Tobacco Use

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

Youth Tobacco Use

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

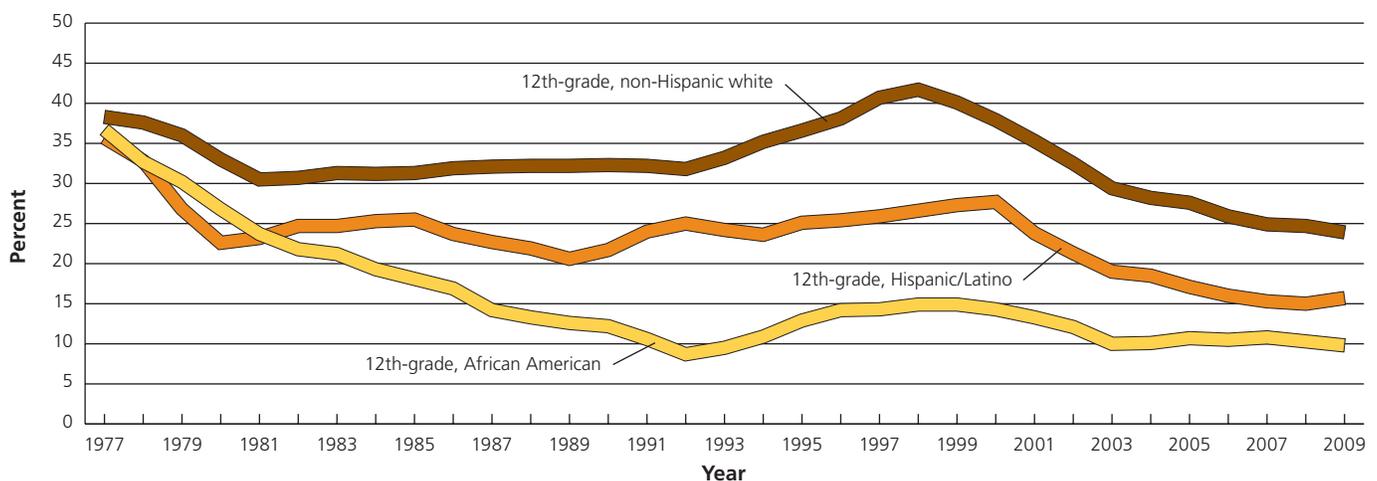
Current Patterns and Trends in Cigarette Smoking

- In 2007, data from the Youth Risk Behavior Survey (YRBS) showed that 20% of high school students reported current cigarette smoking (smoking on at least one day in the past 30 days) and 8.1% reported frequent smoking (smoking on 20 or more of the past 30 days) (Table 1A).⁷

- Although the percentage of high school students who reported current cigarette smoking decreased from 1997 to 2003, the prevalence did not change significantly between 2003 and 2007.⁸ Other surveys have also generally found slowing or stalling smoking declines among youth.^{9, 10} Smoking rates were stable for all gender and racial/ethnic groups except for African American females, who have shown a continuous decline since 1999.⁷
- According to the Monitoring the Future survey, cigarette smoking varies by race/ethnicity among 12th-graders, with prevalence being highest among non-Hispanic whites, followed by among Hispanics/Latinos, and the lowest among African Americans (Figure 1A).
- Of the 39 states surveyed in 2007, Utah had the lowest youth smoking prevalence (7.9%) and West Virginia had the highest rate (27.6%) (Table 1A).

The decrease in smoking among high school students between 1997 and 2003 has been attributed – at least in part – to increased cigarette excise taxes, restrictions on smoking in public places, and counter-advertising campaigns. The recent stall in the rate of decline may be related to increases in tobacco industry expenditures on marketing and promotions, declines in funding for comprehensive tobacco control programs, and a lack of substantial increases in retail cigarette price, due to extensive industry price discounting.⁸

Figure 1A. Current Cigarette Smoking*, 12th-graders, by Race/Ethnicity, US, 1977-2009†



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

Source: Monitoring the Future survey, 1975-2009, University of Michigan.

American Cancer Society, Surveillance and Health Policy Research, 2010

Table 1A. Tobacco Use, High School Students, by State and City, US, 2007

Location	% Current cigarette smoking*	Rank [†]	% Frequent cigarette smoking [‡]	% Current cigar use [§]	% Current smokeless tobacco use [¶]
United States	20.0		8.1	13.6	7.9
State					
Alaska	17.8	10	7.4	10.1	10.4
Arizona (Including Charter Schools)	22.2	30	6.9	N/A	N/A
Arkansas	20.7	24	8.7	17.4	11.2
Connecticut	21.1	26	8.9	N/A	N/A
Delaware	20.2	21	8.5	12.5	5.2
Florida	15.9	7	6.8	12.0	6.1
Georgia	18.6	14	6.9	16.1	8.4
Hawaii	12.8	2	4.5	N/A	N/A
Idaho	20.0	19	8.2	14.5	11.8
Illinois	19.9	18	9.3	13.3	4.9
Indiana	22.5	31	10.8	17.7	10.7
Iowa	18.9	15	8.1	11.7	8.1
Kansas	20.6	23	9.4	14.4	9.4
Kentucky	26.0	38	13.4	15.5	15.8
Maine	14.0	5	5.9	13.8	6.2
Maryland	16.8	8	7.4	11.0	4.2
Massachusetts	17.7	9	8.1	14.6	6.7
Michigan	18.0	12	8.1	14.7	8.9
Mississippi	19.2	17	7.3	14.9	7.8
Missouri	23.8	34	11.5	15.0	9.1
Montana	20.0	20	8.1	15.5	12.9
Nevada	13.6	3	5.0	N/A	4.5
New Hampshire	19.0	16	8.9	17.2	7.2
New Mexico	24.2	35	6.7	18.9	11.8
New York	13.8	4	6.0	9.0	5.1
North Carolina	22.5	32	9.3	N/A	N/A
North Dakota	21.1	27	9.9	11.4	11.7
Ohio	21.6	29	10.3	N/A	9.8
Oklahoma	23.2	33	9.4	15.0	13.7
Rhode Island	15.1	6	6.2	12.9	6.5
South Carolina	17.8	11	8.1	12.7	7.9
South Dakota	24.7	36	11.8	N/A	11.2
Tennessee	25.5	37	12.1	16.4	12.9
Texas	21.1	28	7.1	15.2	7.9
Utah	7.9	1	2.5	7.0	4.9
Vermont	18.2	13	7.9	N/A	8.6
West Virginia	27.6	39	14.4	14.5	14.8
Wisconsin	20.5	22	9.4	15.8	7.7
Wyoming	20.8	25	9.9	N/A	14.7
City					
Baltimore, MD	9.2	7	3.9	8.6	1.4
Boston, MA	7.5	2	2.1	8.2	3.9
Broward County, FL	14.0	19	5.3	10.9	3.5
Charlotte-Mecklenburg, NC	15.3	22	5.8	N/A	N/A
Chicago, IL	13.2	17	3.2	11.9	3.0
Dallas, TX	15.0	21	2.8	16.9	4.2
DeKalb County, GA	8.5	4	2.8	11.4	2.3
Detroit, MI	6.2	1	1.8	9.1	2.9
District of Columbia	10.6	8	3.1	10.1	5.6
Hillsborough County, FL	13.8	18	5.6	13.8	7.2
Houston, TX	11.7	12	2.4	13.2	4.0
Los Angeles, CA	12.8	15	2.8	9.8	3.4
Memphis, TN	8.8	6	2.9	12.5	1.0
Miami-Dade County, FL	11.2	11	3.1	8.0	3.1
Milwaukee, WI	12.3	14	5.3	13.2	2.2
New York City, NY	8.5	5	2.7	4.5	2.2
Orange County, FL	13.1	16	4.2	10.8	4.0
Palm Beach County, FL	14.4	20	4.4	10.2	4.7
Philadelphia, PA	10.7	9	3.9	6.8	3.0
San Bernardino, CA	11.7	13	2.5	7.2	2.0
San Diego, CA	11.0	10	3.6	9.9	3.3
San Francisco, CA	8.0	3	1.9	N/A	N/A

*Smoked cigarettes on one or more of the 30 days preceding the survey. †Rank is based on % current cigarette smoking. ‡Smoked cigarettes on 20 or more of the 30 days preceding the survey. §Smoked cigars, cigarillos, or little cigars on one or more of the 30 days preceding the survey. ¶Used chewing tobacco or snuff on one or more of the 30 days preceding the survey. N/A = Data not available. **Note:** Data are not available for all states since participation in the Youth Risk Behavior Surveillance System is a voluntary collaboration between a state's departments of health and education.

Source: Youth Risk Behavior Surveillance System, 2007, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention. *MMWR Morb Mortal Wkly Rep.* 2008;57(SS-4)

American Cancer Society, Surveillance and Health Policy Research, 2010

Other Tobacco Products

While cigarettes remain the primary tobacco product used by youth, cigars, smokeless tobacco products, and hookahs (tobacco water pipes) have grown in popularity. Table 1A provides data from the YRBS on current cigar and smokeless tobacco use among high school students in states and cities for which these data were available for 2007.

- About 26% of high school students reported current use of any tobacco product.¹¹ Of these products, cigarettes (20%) were most commonly used, followed by cigars (13.6%) and smokeless tobacco products (7.9%).¹²
- Male and female students were equally likely to smoke cigarettes. By comparison, males were six times more likely to use smokeless tobacco products and three times more likely to smoke cigars than females.¹²
- Non-Hispanic white and Hispanic/Latino students predominantly smoke cigarettes, while non-Hispanic African Americans are equally likely to smoke cigarettes and cigars.¹²
- YRBS data show that while smokeless tobacco among high school boys declined significantly from 19.2% in 1993 to 11% in 2003, this decline seems to have stalled (2007: 13.4%). Other national surveys indicate significant increasing trends in current use and initiation among boys in this age group.^{9, 13} Use among high school girls remains low and has changed little in this time period (1.3% to 2.3%).¹²

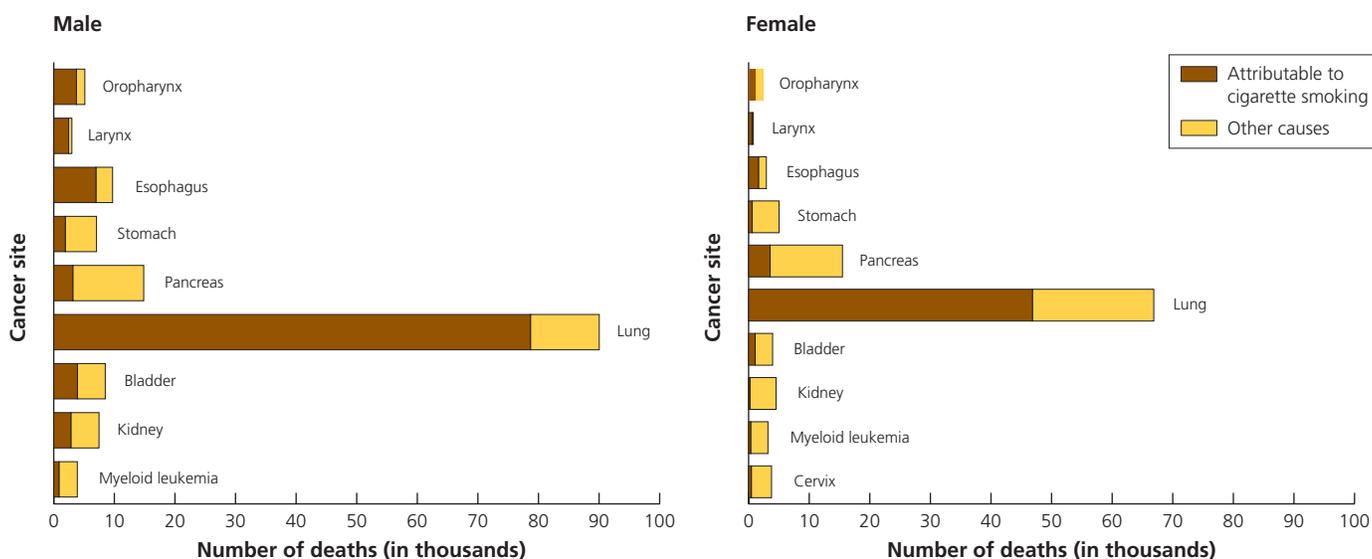
- Of the states with data available, cigar use was lowest in Utah (7%) and highest in New Mexico (18.9%), whereas smokeless tobacco use was lowest in Maryland (4.2%) and highest in Kentucky (15.8%) (Table 1A).
- An emerging trend among adolescent and young adult smokers is the use of tobacco water pipes or hookahs. Current use estimates range from 10% to 20% among college students and 11% to 17% among adolescents.^{14, 15}

Use of tobacco in any form may induce nicotine dependence and harm health. Prevention and cessation programs should address other tobacco products in addition to cigarettes. Apart from tobacco control strategies outlined in the following sections, the US Surgeon General recommends that school-based tobacco prevention programs that begin by sixth grade can be an effective part of comprehensive tobacco control programs.¹⁶

Adult Tobacco Use

Tobacco use increases the risk of cancers of the lung, mouth, nasal cavities, larynx, pharynx, esophagus, stomach, colorectum, liver, pancreas, kidney, bladder, uterine cervix, ovary (mucinous), and myeloid leukemia.^{17, 18} The International Agency for Research on Cancer (IARC) recently concluded that there is limited evidence that tobacco smoking causes female breast cancer.¹⁸ Exposure to secondhand smoke increases the risk of lung cancer.^{19, 20} Thirty percent of cancer deaths, including 87%

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



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

American Cancer Society, Surveillance and Health Policy Research, 2010

of lung cancer deaths, can be attributed to tobacco^{2, 17, 20} (Figure 1B). The overall mortality that is attributable to smoking varies across states, ranging from 138 per 100,000 in Utah to 371 per 100,000 in Kentucky (Table 1C).

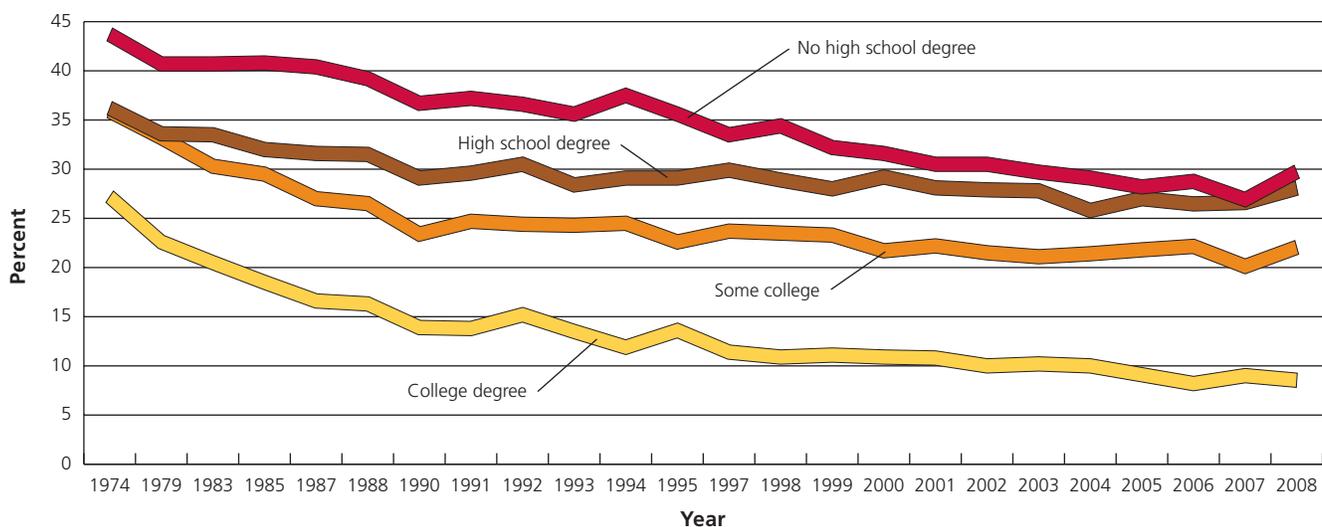
Current Patterns and Trends in Cigarette Smoking

- According to the National Health Interview Survey (NHIS), 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. Between 2004 and 2008, smoking rates were steady between 2004 and 2006, declined in 2007, and remained unchanged between 2007 and 2008 (men: 23.1%, women: 18.3%). Currently, an estimated 79.8% (36.7 million) of smokers smoke cigarettes daily.²¹
- The largest disparities in smoking prevalence are by socioeconomic status (SES), race/ethnicity, and state of residence.
- Adults without a high school degree are three times more likely to be current smokers than those with a college degree (Table 1B).
- The prevalence of smoking among American Indian/Alaska Native adults is the highest among all racial/ethnic groups and is almost three times that of Asian American adults (Table 1B).
- According to the 2008 Behavioral Risk Factor Surveillance System (BRFSS), the state with the highest smoking prevalence (West Virginia, 26.6%) has a rate that is almost three times that of the state with the lowest prevalence (Utah, 9.2%) (Table 1C).

Socioeconomic and geographic differences in smoking trends

A recent study by American Cancer Society researchers showed that between 1992-1993 and 2006-2007, smoking rates among adults declined significantly among all race and ethnic groups, but more quickly among non-Hispanic African Americans and Hispanics than among non-Hispanic whites.²² Progress, however, was related strongly to SES and disparities by educational level persisted during this time period; the greatest decline among most race/ethnic groups was among college-educated adults and the lowest for those with less than a high school degree. In addition, between 1997 and 2007, annual smoking prevalence declined significantly in men in 37 states and in women in 38 states. Among women, nine of the 13 states with no change in smoking rates during this time are located in the South and the remaining are in the Midwest, whereas among men such states were concentrated in the South and the West.²² These state-level variations in smoking trends have implications with respect to lung cancer; for example, most states with increasing lung cancer death rates among women between 1996 and 2005 are in the South and Midwest, areas of the country where significant declines in smoking have not been observed.

Figure 1C. Current* Cigarette Smoking, Adults 25 and Older, by Education†, US, 1974-2008



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

Source: 1974-2006: National Center for Health Statistics, Health, United States, 2006, 2007. With Chartbook on Trends in the Health of Americans. Hyattsville, Maryland, 2006, 2007. 2007, 2008: National Health Interview Survey Public Use Data File, 2007, 2008 National Center for Health Statistics, Centers for Disease Control and Prevention, 2008.

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Other Tobacco Products

Despite evidence that cigars and smokeless tobacco products have substantial health risks, the use of some of these products has continued to increase. A recent study found that while cigarette sales decreased by 18% between 2000 and 2007, sales of other tobacco products (in cigarette-pack equivalents), including small cigars, roll-your-own tobacco, and moist snuff, increased by 115%, 91%, and 33%, respectively, during the same time period.²³ This increase in other tobacco product sales offset declines in cigarette sales by approximately 30%.²³

Cigar Smoking

Cigar smoking increases the risk of cancers of the lung, oral cavity, larynx, esophagus, and probably pancreas. Cigar smokers are four to 10 times more likely to die from laryngeal, oral, or esophageal cancers than nonsmokers.²⁴

- According to the National Survey on Drug Use and Health (NSDUH), in 2008, 5.4% of adults – 9.4% of men and 1.7% of women aged 18 years and older – had smoked cigars in the past month.²⁵
- According to the Tobacco Use Supplements to the Current Population Survey (CPS-TUS), Alaska had the highest cigar-smoking prevalence (5.4%) and Hawaii had the lowest (2.2%) (Table 1C).
- As a percent of the cigar market, sales of little cigars and cigarillos increased from 62% to 79% between 1993 and 2006, while contemporaneous sales of large cigars fell from 37% to 22%.²⁶

Smokeless Tobacco

Smokeless tobacco products, including chewing tobacco and snuff, are not safe substitutes for smoking cigarettes or cigars. These products increase the risk of oral, pancreatic, and esophageal cancer, as well as noncancerous oral conditions, and are a major source of carcinogenic nitrosamines.²⁷ Compared to quitting completely, switching to any smokeless product as a substitute for smoking has also been shown to be harmful.²⁸

- In 2008, according to data from the NSDUH, 3.6% of adults 18 and older, 7.1% of men and 0.3% of women, used smokeless products in the past month.
- American Indian/Alaska Natives (5.7%) and whites (4.6%) were more likely to use smokeless tobacco than Hispanic/Latinos (1.2%), Asians (1.2%), or African Americans (1.6%).²⁹
- Among states, the smokeless tobacco use was highest among South and North-Central US states, including Wyoming (7.9%), West Virginia (5.9%), and Arkansas (5%), and lowest among Northeastern states such as Massachusetts (0.3%) and New Jersey (0.3%) (Table 1C).

Table 1B. Current Cigarette Smoking*, Adults 18 and Older, US, 2008

Characteristic	% Men	% Women	% Total
Age group (years)			
18 to 24	23.7	19.0	21.4
25 to 44	26.4	21.1	23.7
45 to 64	24.8	20.5	22.6
65 or older	10.6	8.4	9.3
Race/ethnicity			
White (non-Hispanic)	23.5	20.6	22.0
African American (non-Hispanic)	25.6	17.8	21.3
Hispanic/Latino	20.7	10.7	15.8
American Indian/Alaska Native (non-Hispanic) [†]	42.3	22.4	32.4
Asian (non-Hispanic) [‡]	15.7	4.7	9.9
Education (years)[§]			
8 or fewer	24.2	13.0	19.0
9 to 11	38.1	33.6	35.7
12 (no diploma)	33.8	19.0	26.4
GED diploma [¶]	45.2	37.5	41.3
High school graduate	30.0	21.5	25.5
Associate degree	21.8	17.3	19.3
Some college	25.5	20.4	22.7
Undergraduate degree	11.5	9.7	10.6
Graduate degree	5.6	5.9	5.7
Total	23.1	18.3	20.6

*Persons who reported having smoked at least 100 cigarettes or more and who reported now smoking every day or some days. †Estimates should be interpreted with caution because of the small sample sizes. ‡Does not include Native Hawaiians and other Pacific Islanders. §Persons aged 25 years or older. ¶General Educational Development.

Source: National Health Interview Survey, 2008, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention. Cigarette smoking among adults and trends in smoking cessation – United States, 2009. *MMWR Morb Mortal Wkly Rep.* 2009;58(44):1227-1232.

American Cancer Society, Surveillance and Health Policy Research, 2010

The tobacco industry continues to market smokeless products as supplemental sources of nicotine in smoke-free settings or misleadingly as a low-risk option for smokers who are unable to quit.³⁰⁻³² Among the new products introduced by the tobacco industry in the US is snus, a “spitless,” low-nitrosamine moist powder tobacco pouch placed between the user’s cheek and gum. In addition to snus, R.J. Reynolds is test marketing a new, dissolvable tobacco product called Camel Orbs in Portland, Oregon; Columbus, Ohio; and Indianapolis, Indiana. These dissolvable tobacco products are finely ground tobacco in mint-sized pellet shapes and are meant to dissolve in the mouth in three to 30 minutes. These products are especially troubling because of their appeal to children – they look and dissolve like candy; the packaging is brightly colored and resembles the size

Table 1C. Smoking Attributable Mortality Rate and Tobacco Use, Adults, by State, US, 2006-2007, 2008

	2000-2004	2008				2006-2007		
	Smoking attributable mortality rate*	18 and older	Rank [†]	Men 18 and older	Women 18 and older	Low education [§]	% Current cigar use [¶] (%)	% Current smokeless tobacco use [#] (%)
Alabama	318	22.2	42	25.2	19.4	35.3	2.9	3.9
Alaska	270	21.7	41	23.9	19.3	50.4	5.4	3.6
Arizona	247	15.9	7	18.2	13.7	24.3	3.2	1.2
Arkansas	324	22.4	44	24.4	20.4	31.2	4.1	5.0
California	235	14.0	2	17.8	10.3	16.5	2.9	0.6
Colorado	238	17.6	21	19.8	15.5	32.1	3.3	2.1
Connecticut	238	16.0	8	17.3	14.8	21.1	3.7	0.4
Delaware	281	17.8	22	20.4	15.4	31.9	2.5	0.7
District of Columbia	250	16.4	11	19.4	13.8	26.9	4.6	0.2
Florida	259	17.5	18	18.7	16.4	25.7	3.2	0.9
Georgia	299	19.5	32	21.7	17.4	35.7	3.2	2.0
Hawaii	168	15.4	5	18.2	12.7	25.1	2.2	0.5
Idaho	237	16.9	15	18.4	15.4	37.1	3.3	2.7
Illinois	263	21.3	39	25.4	17.5	32.7	3.3	1.0
Indiana	309	26.1	50	28.5	23.9	42.8	3.4	1.7
Iowa	248	18.8	29	21.0	16.7	33.0	4.4	3.0
Kansas	263	17.9	23	19.8	16.1	34.1	4.5	3.5
Kentucky	371	25.3	49	26.3	24.3	45.1	4.1	3.8
Louisiana	300	20.5	37	23.4	17.7	29.6	2.8	2.5
Maine	290	18.2	25	21.6	15.0	33.6	4.0	1.3
Maryland	262	14.9	4	16.1	13.9	28.0	3.5	0.7
Massachusetts	249	16.1	9	16.9	15.4	26.8	2.7	0.3
Michigan	282	20.4	36	22.5	18.4	43.5	4.1	1.5
Minnesota	215	17.6	19	19.3	15.8	23.5	4.4	2.4
Mississippi	334	22.7	45	25.4	20.3	32.9	3.8	4.3
Missouri	308	25.0	48	27.3	22.9	50.5	4.0	2.5
Montana	276	18.5	27	18.7	18.4	33.9	4.0	4.5
Nebraska	236	18.4	26	20.1	16.8	30.7	3.9	3.7
Nevada	344	22.3	43	24.5	20.0	24.8	2.8	1.0
New Hampshire	272	17.0	16	18.1	16.0	36.8	3.7	0.6
New Jersey	240	14.8	3	17.4	12.4	21.7	3.3	0.3
New Mexico	234	19.4	30	22.0	16.9	26.0	3.9	2.5
New York	246	16.8	14	17.9	15.8	26.2	2.8	0.5
North Carolina	298	20.9	38	23.7	18.3	28.9	3.1	3.1
North Dakota	226	18.2	24	20.4	15.9	23.9	3.1	3.9
Ohio	299	20.2	35	21.5	19.0	35.6	4.5	2.5
Oklahoma	332	24.8	47	26.5	23.1	35.0	3.5	4.9
Oregon	263	16.3	10	17.4	15.3	27.9	3.3	2.7
Pennsylvania	259	21.4	40	23.4	19.6	33.4	4.0	2.5
Rhode Island	267	17.4	17	17.9	16.9	27.9	4.1	0.3
South Carolina	293	20.1	34	21.6	18.7	31.0	3.4	2.2
South Dakota	239	17.6	20	19.0	16.2	25.7	3.0	4.0
Tennessee	325	23.2	46	26.7	20.0	43.0	3.5	3.3
Texas	273	18.6	28	22.5	14.9	23.2	3.5	2.2
Utah	138	9.2	1	10.6	7.9	23.1	2.4	2.3
Vermont	248	16.8	13	18.4	15.2	37.9	3.7	1.5
Virginia	267	16.5	12	17.1	15.9	29.7	3.5	2.0
Washington	261	15.7	6	17.0	14.4	28.7	3.7	2.7
West Virginia	344	26.6	51	26.1	27.1	36.5	2.6	5.9
Wisconsin	244	19.9	33	21.7	18.2	35.3	3.6	2.1
Wyoming	283	19.4	31	20.0	18.9	31.2	3.8	7.2
United States**	263	18.5		20.8	16.4	27.4	3.9	1.8
Range	138-371	9.2-26.6		10.6-28.5	7.9-27.1	16.5-50.5	2.2-5.4	0.2-7.2

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

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

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and shape of mint tins or cellphones; and the use and packaging of the products are easily concealed from teachers and parents. Although such products may be perceived as having lower risk, they may actually provide a gateway to smoking among non-smokers, especially children, and may increase overall tobacco use by encouraging dual use of cigarettes and other tobacco products.^{33,34} The products also may discourage use of evidence-based cessation therapies among those who want to quit. Therefore, it is important to regulate the marketing of smokeless tobacco products and to counteract claims of their potential benefits as a safer alternative to smoking.

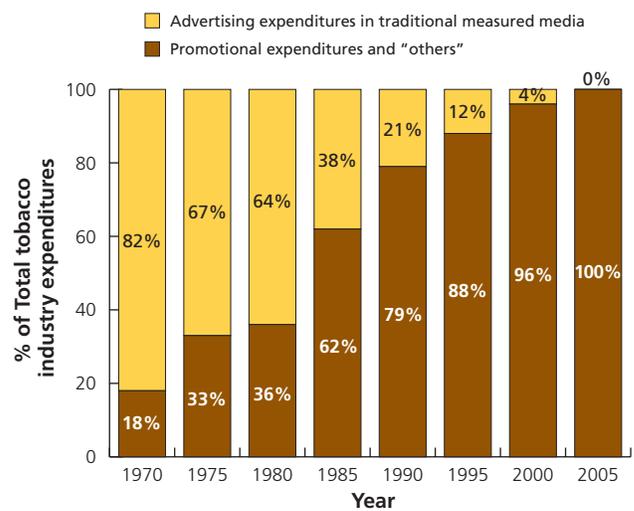
Comprehensive Tobacco Control Programs

Comprehensive tobacco control programs aim to reduce tobacco use and disease, disability, and death associated with tobacco use by applying an optimal mix of evidence-based economic, policy, regulatory, educational, social, and clinical strategies.^{16, 35} Interventions that effectively reduce tobacco use include increases in excise taxes, restrictions on smoking in public places, prevention and cessation programs, and effective anti-tobacco media campaigns.¹⁶

In 2007, the Centers for Disease Control and Prevention (CDC) updated its recommendations on *Best Practices for Comprehensive Tobacco Control Programs*.³⁵ According to these guidelines, effective state-based comprehensive tobacco control programs must include the following components:

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

Figure 1D. Cigarette Advertising* vs. Promotional Expenditures† as a Percent of Total Tobacco Industry Expenditures‡, US, 1970-2005



*Advertising expenditures in traditional measured media include newspapers, magazines, outdoor, and transit. †Promotional expenditures and "others" include point of sale, promotional allowances, sampling distribution, specialty item distribution, public entertainment, direct mail, endorsements/testimonials, Internet, coupons, retail value added, and all others. ‡Adjusted to 2006 dollars, using the consumer price index.

Source: The Role of the Media in Promoting and Reducing Tobacco Use. Tobacco Control Monograph No.19. Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute; June 2008. Original data: Federal Trade Commission, Federal Trade Commission Cigarette Report for 2004 & 2005, Washington, DC, 2007.

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Evidence for these recommendations stems in part from states that have documented the benefits of implementing comprehensive tobacco control programs.¹⁶ For example, as a result of its long-standing comprehensive tobacco control program, which included excise taxes increases, California has experienced greater reductions in cigarette consumption among daily smokers 35 years or older and cessation rates among adult smokers 35 years or younger than have other states with high cigarette prices but no comprehensive tobacco control programs, or low cigarette prices and no comprehensive tobacco control programs.^{36,37} As a result,

According to the US Surgeon General, the goals of comprehensive tobacco control include:¹⁶

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

these reductions in smoking have led to reductions in tobacco-related cancers. Lung cancer incidence in California has declined more rapidly after the implementation of its comprehensive tobacco control program than would have been predicted from prior trends in the state.³⁸ Additionally, the California program's estimated impact in reducing personal health care expenditures was \$86 billion.³⁹

Federal initiatives in tobacco control

While states have been at the forefront of tobacco control efforts, the importance of the federal government's role was emphasized in 2007 by the Institute of Medicine.⁴⁰ Some recent federal tobacco control initiatives include:

Regulation of tobacco products: On June 22, 2009, President Obama signed into law the Family Smoking Prevention and Tobacco Control Act, which for the first time grants the US Food and Drug Administration (FDA) the authority to regulate the manufacturing, marketing, and sale of tobacco products.⁴¹ The new law creates the Center for Tobacco Products at the FDA, which has the authority to require changes to tobacco products, such as the removal of harmful ingredients; to require the reduction of nicotine levels to make them less addictive; to require larger, more effective warning labels on tobacco products; and to prohibit unsubstantiated and false health claims made by the industry about their products. The law outlines specific implementation dates for several key provisions; by July 2010, restrictions on the marketing and sales of tobacco products to youth take effect, the use of misleading descriptors such as "light," "low," and "mild" is banned, and new, larger, more effective warning labels are required on smokeless tobacco products. To date, fruit and candy flavorings in cigarettes have been banned and the tobacco industry is required to disclose the ingredients of their products to the FDA. In addition, the law grants states and localities the authority to further restrict tobacco industry marketing and promotions.

Federal tobacco taxes: In 2009, a new federal law expanded the State Children's Health Insurance Program, which is funded by an increase in the federal tobacco tax rate, including an increase in cigarette taxes from \$0.39 per pack to slightly more than \$1 per pack and other tobacco products (cigars, snuff, and chewing, pipe, and roll-your-own). This and other future federal tobacco tax increases will prevent smoking initiation, reduce consumption, and promote quitting. In addition, such increases can also form an important revenue source for federally funded cessation and other tobacco control programs.

Federal funding: As part of a federal stimulus legislation called the American Recovery and Reinvestment Act of 2009, the federal government created the Communities Putting Prevention to Work initiative, which makes nearly \$450 million in community grants and \$120 million available to states and territories toward

prevention programs, including evidence-based tobacco control efforts such as tobacco quitlines and media campaigns.

Other initiatives that would bolster the national tobacco control infrastructure include the ratification of the World Health Organization Framework Convention on Tobacco Control (FCTC), a global health treaty developed to curtail the tobacco epidemic,⁴² and passage of federal legislation to institute health system changes to promote coverage and access to effective tobacco dependence treatments through government health programs, including Medicaid and Medicare, and private health insurance plans.

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

Tobacco Excise Taxes

The price of cigarettes is inversely and predictably related to consumption: A 10% increase in price reduces overall cigarette consumption by 3%-5%.¹⁶ Young people who smoke are up to three times more responsive to price increases than adults.⁴³ Raising cigarette prices by increasing excise taxes reduces tobacco consumption, especially among children. It also prevents tobacco use among adolescents and young adults and increases cessation among adults.³³ Increased excise taxes also raise governmental revenue, which can be used for tobacco control.^{16, 40} In addition, cigarette price increases through taxation could potentially reduce socio-economic disparities, given that low-income smokers and certain lower SES occupational groups are more responsive to tax increases than higher SES groups.^{44, 45}

- Cigarette taxes can be levied at the federal, state, and local levels. Currently, the federal excise tax is \$1.066 per pack. There is wide variation in state cigarette excise taxes, ranging from 17 cents per pack in Missouri to \$3.46 per pack in Rhode Island (Table 1D).
- Currently, four states (Rhode Island, Washington, Connecticut, and Hawaii) and Guam have cigarette tax rates of \$3 or more; 14 states, the District of Columbia, and Guam have tax rates of \$2 or more per pack; and 29 states, the District of Columbia, Puerto Rico, the Northern Marianas, and Guam have tax rates of \$1 or more per pack.⁴⁶ States that have tax rates of less than \$1 per pack of cigarettes are mostly concentrated in the Southeast and central US, and include several tobacco-growing states. (See cover, Table 1D.)
- Although 47 states and the District of Columbia have increased their cigarette taxes since 2000, only 24 states have laws requiring that a portion of their excise taxes be dedicated to health, cancer control, or tobacco control programs (Table 1D).^{46, 47}

Table 1D. Comprehensive Tobacco Control Measures, by State, US, 2010

	Cigarette tax per pack(\$)*	100% smoke-free laws in workplaces and/or restaurants and/or bars†	Fiscal year per capita tobacco control funding (\$)	Tobacco control funding as a % of tobacco revenue‡
Alabama	0.425		0.47	0.8
Alaska	2.00†		13.72	8.2
Arizona	2.00†	W, R, B	4.56	4.9
Arkansas	1.15†		7.41	7.2
California	0.87†	R, B	2.33	4.5
Colorado	0.84†	R, B	2.88	4.1
Connecticut	3.00†	R, B	2.11	1.5
Delaware	1.60	W, R, B	13.78	6.4
District of Columbia	2.50	W, R, B	2.45	1.6
Florida	1.339†	W, R	4.24	4.4
Georgia	0.37		0.39	0.8
Hawaii	3.00†	W, R, B	7.26	5.2
Idaho	0.57†	R	1.78	3.0
Illinois	0.98	W, R, B	0.78	1.1
Indiana	0.995†		1.94	1.9
Iowa	1.36	W, R, B	3.79	3.7
Kansas	0.79	W, R, B	0.86	1.3
Kentucky	0.60†		0.96	1.0
Louisiana	0.36†	W, R	1.99	3.0
Maine	2.00	W, R, B	9.26	6.0
Maryland	2.00	W, R, B	1.26	1.2
Massachusetts	2.51	W, R, B	0.96	0.7
Michigan	2.00†	W, R, B	0.43	0.3
Minnesota	1.560†	W, R, B	4.37	3.8
Mississippi	0.68		4.11	4.6
Missouri	0.17		0.43	0.9
Montana	1.70	W, R, B	10.42	7.8
Nebraska	0.64†	W, R, B	2.45	3.9
Nevada	0.80	W, R	1.90	2.4
New Hampshire	1.78	R, B	0.81	0.4
New Jersey	2.70†	W, R, B	1.06	0.9
New Mexico	1.66†	R, B	5.83	10.2
New York	2.75†	W, R, B	4.32	3.9
North Carolina	0.45†	R, B	2.48	4.7
North Dakota	0.44	W	14.64	16.1
Ohio	1.25	W, R, B	0.65	0.6
Oklahoma	1.03†		6.11	5.4
Oregon	1.18†	W, R, B	2.25	2.4
Pennsylvania	1.60	W	1.55	1.3
Rhode Island	3.46	W, R, B	1.81	1.0
South Carolina	0.57		0.80	2.8
South Dakota	1.53†	W	7.95	6.6
Tennessee	0.62		0.26	0.3
Texas	1.41		0.64	0.7
Utah	1.70†	W, R, B	3.72	8.6
Vermont	2.24	W, R, B	9.69	6.9
Virginia	0.30		1.89	4.3
Washington	3.025†	W, R, B	2.92	3.0
West Virginia	0.55		3.82	3.9
Wisconsin	2.52	W, R, B	1.51	1.0
Wyoming	0.60		11.75	12.5
United States¶	1.42		3.83	2.6
Range	0.17-3.46		0.26-14.64	0.3-16.1

*Taxes in effect or increases passed, reported as of May 2010. †States with laws that require a portion of cigarette excise tax revenues be dedicated to cancer- or tobacco-control programs. ‡Smoke-free laws passed or implemented, reported as of April 2010. Note: At the time of publication of this report, smoke-free laws in Kansas (W,R,B), Michigan (W,R,B), and Wisconsin (W,R,B) as reported here, were not yet in effect. Note: W-workplaces, R-restaurants, B-bars. §Tobacco revenue is the projected collections from tobacco taxes and payments to states from the Master Settlement agreement with the tobacco companies. ¶The United States estimate represents an average of state values (including District of Columbia) for taxes and per-capita funding.

Source: Cigarette Taxes: American Cancer Society Cancer Action Network, May 2010. Campaign for Tobacco-Free Kids, et al. State cigarette excise tax rates and rankings. National Center for Tobacco-Free Kids, 2010. Dedicated excise tax: National Cancer Institute. State Cancer Legislative Database Factsheet: Tobacco Product Excise Taxes. 2008. 100% Smoke-free laws: American Nonsmokers' Rights Foundation. Overview List – How Many Smokefree Laws? 2010. Tobacco control Funding & Tobacco control funding as a % of tobacco revenue: A Decade of Broken Promises: the 1998 Master Settlement Agreement Eleven Years Later. National Center for Tobacco-Free Kids, 2009. Per capita funding is calculated by dividing state prevention funding by 2000 US Census state population counts (census.gov).

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- With the exception of Pennsylvania, all states tax non-cigarette tobacco products to some extent. Florida does not tax cigars, but taxes other tobacco products.⁴⁸
- States differ in the taxation of non-cigarette tobacco products; they are taxed either as a percent of wholesale or retail price (recommended method) or based on weight. The national average among states that tax moist snuff as a percentage of price is 35%, with the highest tax rates in Wisconsin (100%), Washington (95%), Vermont (92%), Massachusetts (90%), Rhode Island (80%), Maine (78%), and Alaska (75%) and the lowest rates in South Carolina (5%), Tennessee (6.6%), and West Virginia (7%).⁴⁸

Even though state excise taxes have risen in the past few decades, in 2006 tobacco companies devoted approximately 92% of their marketing expenditures or about \$11.8 billion on strategies to buffer price-sensitive smokers from the shock of price increases, including cigarette price discounts, promotional allowances to retailers or wholesalers, coupons and retail-value added and others.⁴⁹ Furthermore, in most states, taxes on cigarettes and other tobacco products are not equivalent, with small cigars and roll-your-own tobacco taxed at 5%-10% the rate of cigarettes.²³ It is important to regulate other tobacco products, including small cigars, and advocate for higher excise taxes on these products that are commensurate with increases in cigarette excise taxes because such discrepancies in price may lead to young smokers substituting or taking up new tobacco products in lieu of cigarettes.^{50, 51} Excise tax increases should be conjoined with state and federally funded efforts to provide evidence-based cessation services to low SES smokers given that these groups may have fewer opportunities to access effective tobacco-dependence treatments in order to quit.^{40, 52}

Smoke-free Initiatives to Reduce Exposure to Secondhand Smoke

Exposure to secondhand smoke increases the risk of lung cancer, coronary artery disease, and heart attacks.^{19, 20, 53} As such, smoke-free initiatives (also referred to as clean indoor air laws or ordinances) implemented at the state or local level are an important component of comprehensive tobacco control. Comprehensive smoking bans reduce exposure to secondhand smoke (SHS). Nationally, exposure to SHS among nonsmokers, as measured by detectable levels of cotinine (a metabolite of nicotine), declined from 84% in 1988-1994 to 46% in 1999-2004, a likely reflection of widespread implementation of smoke-free laws and reductions in smoking prevalence.⁵⁴

State and local smoke-free legislation

- Reflecting the current success of smoke-free legislation, 74.2% of the US population is covered by a 100% smoke-free provision in workplaces, and/or restaurants, and/or bars.⁵⁶

Effectiveness of Smoke-free Laws

Smoke-free laws are effective in reducing secondhand smoke exposure, modifying smoking behavior, and reducing disease risk.^{53, 55} According to a recent landmark report by the International Agency for Research on Cancer (IARC)⁵⁵:

There is sufficient evidence that:*

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

There is strong† evidence suggesting that:

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

*Sufficient evidence indicates that the association was judged to be causal.
†Strong evidence indicates that the evidence of the association is consistent, but evidence of causality is limited.

- Seventy-five percent of indoor workers had a smoke-free policy in their workplace in 2006-2007, compared to 46.1% in 1992-1993.⁵⁷
- There are 3,117 municipalities in the country with some form of local smoke-free legislation. Currently, 379 municipalities have local laws to establish 100% smoke-free workplaces, restaurants, and bars.⁵⁶
- Thirty-five states, the District of Columbia, the Northern Mariana islands, and Puerto Rico have either implemented or enacted statewide smoking bans that prohibit smoking in workplaces, and/or restaurants, and/or bars.⁵⁶ Twenty-two of these states, the District of Columbia, and Puerto Rico, provide comprehensive smoke-free protection, meaning that all workplaces, restaurants, and bars are 100% smoke-free (Table 1D).⁵⁶ Several other states have had success enacting limited forms of smoke-free legislation.
- Fifteen states and Puerto Rico have enacted 100% smoke-free laws for all state-regulated gaming facilities.⁵⁶

- However, 13 states have enacted either partial or complete preemption laws that prohibit local governments from enacting smoke-free air laws.⁵⁸

Despite tremendous progress in reducing population exposure to secondhand smoke, disparities exist. Declines in exposure to secondhand smoke since the late 1980s have been twice as large among non-Hispanic whites, compared to non-Hispanic African Americans.⁵⁴ As a result of strong opposition to smoke-free policies in hospitality and gaming facilities (including most tribally owned casinos and bars), some occupational groups have not benefited as much as others from the adoption of workplace clean air laws. These disparities underscore the need for comprehensive smoke-free legislation that covers all segments of society.

Countering Tobacco Industry Marketing

Exposure to tobacco industry marketing significantly increases the likelihood that adolescents initiate and continue tobacco use and increases per-capita cigarette consumption in the general population.⁵⁹ In 2006, the tobacco industry spent \$12.49 billion on cigarette marketing, increasingly redirecting the majority of its marketing expenditures toward promotional activities that circumvent tobacco tax increases.^{49, 59} Between 1970 and 2005, while tobacco industry marketing expenditures on traditional advertising venues decreased from 82% to almost nothing, promotional expenditures increased from 18% to almost all of the expenditures (Figure 1D). In addition, the industry spent \$354.1 million on smokeless tobacco advertising and promotion in 2006, up from \$250.8 million in 2005.⁴⁹ Price discounts in 2006 made up 58% of all smokeless marketing expenditures and increased by 104% from 2005.⁴⁹ There is a need for both further increases in excise taxes and comprehensive restrictions on all tobacco advertising, promotion, and sponsorship to counter the tobacco industry's tactics.

Tobacco industry marketing tactics can also be countered with sustained implementation of effective mass media campaigns that highlight the negative consequences of tobacco use and expose the industry's deceptive marketing and promotional tactics.⁵⁹ The Florida "truth" antismoking campaign and the nationwide "truth" campaign developed messages that countered the perception of smoking as cool and rebellious by highlighting the tobacco industry's deceptive practices.⁵⁹ Anti-smoking media campaigns can reduce tobacco use by reducing smoking initiation among youth and promoting adult cessation.⁵⁹ States that have combined mass media campaigns with other anti-tobacco activities have seen rapid declines in youth and adult smoking prevalence.^{59, 60} Tobacco companies, on the other hand, have launched their own media campaigns that purport to discourage youth smoking and help adult smokers quit. However, recent research has shown that the industry advertisements are not effective in deterring youth smoking and may in fact have a counterproductive effect.⁶¹

Tobacco Cessation

Youth Tobacco Cessation

The opportunity to prevent diseases caused by smoking is greatest when smokers quit early.⁶² Adolescents often underestimate the strength and rapidity of tobacco dependence and generally overestimate their ability to quit smoking.^{5, 63} Most young smokers want to quit smoking and have tried to quit. In 2007, 60.9% of high school smokers made a quit attempt, but only 12.2% were successful.⁶⁴

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

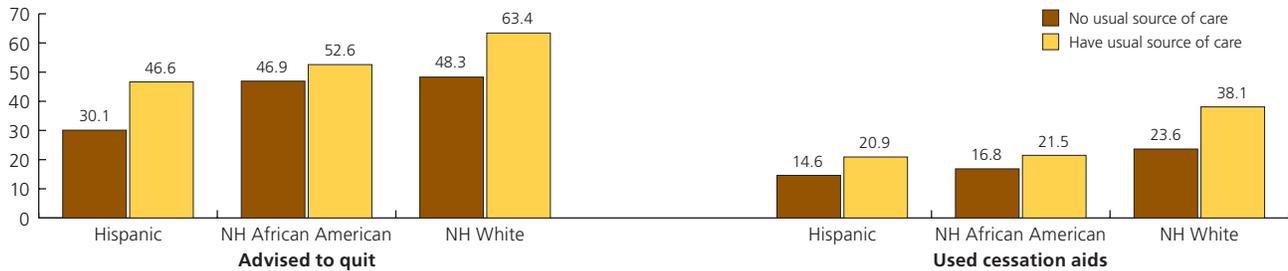
Adult Tobacco Cessation

Much of the risk of premature death from smoking could be prevented by smoking cessation. Smokers who quit can expect to live as many as 10 years longer than those who continue to smoke.^{17, 66} One study showed that those who quit smoking at age 60, 50, 40, or 30 gained about three, six, nine, or 10 years of life expectancy, respectively.⁶⁶

- Smoking cessation in the US, which is measured as the proportion of ever smokers who are former smokers, changed little between 1998 (48.7%) and 2008 (51.1%). Adults with lower levels of education, including GED graduates and those with a high school degree or less, had lower rates of cessation during this time period, while those with graduate or undergraduate degrees had the highest rates.²¹
- According to the 2008 BRFSS, in 42 states and the District of Columbia, the majority of adults (50% or more) who ever smoked have now quit smoking.⁶⁷
- According to the 2008 NHIS, of the 46 million Americans who smoke, 45.3% reported having attempted to quit for at least one day in the past year.²¹
- Reports of quit attempts in the past year among current smokers were highest in Rhode Island (66.7%) and lowest in North Dakota (52.3%), according to the 2008 BRFSS.

Tobacco dependence is a chronic disease and should be treated with effective treatments that can double or triple smokers' chances of long-term abstinence.⁶⁵ According to the latest USPHS

Figure 1E. Physician Advice to Quit* and Use of Recommended Cessation Aids†, by Race/Ethnicity and Usual Source of Care‡, Current Smokers§ 18-64 Years, US, 2005



*Advised by a medical doctor or other health professional to quit smoking or quit using other kinds of tobacco in the past 12 months among current smokers who had seen doctor in the past 12 months. Age adjusted to the 2000 US standard population. †Current smokers who used pharmacotherapy (patch, gum, nasal spray, or inhaler); antidepressant therapy (Zyban, Bupropion, or Wellbutrin); and behavioral counseling (one-on-one counseling or stop-smoking clinic or program) in a quit attempt in the past 12 months. Age adjusted to the 2000 US standard population. ‡A place to usually go to when sick or need advice about health, excluding hospital emergency room. §Current smokers are those who reported having smoked at least 100 cigarettes or more and who reported now smoking every day or some days. Source: National Health Interview Survey Public Use Data File, 2005, National Center for Health Statistics, Centers for Disease Control and Prevention, 2006.

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guidelines, these treatments include nicotine replacement treatment (NRT) products, prescription medications, or combinations of these medications and counseling (individual, group, or telephone).⁶⁵ The combined use of counseling and medication can be more effective than the individual use of any treatments.

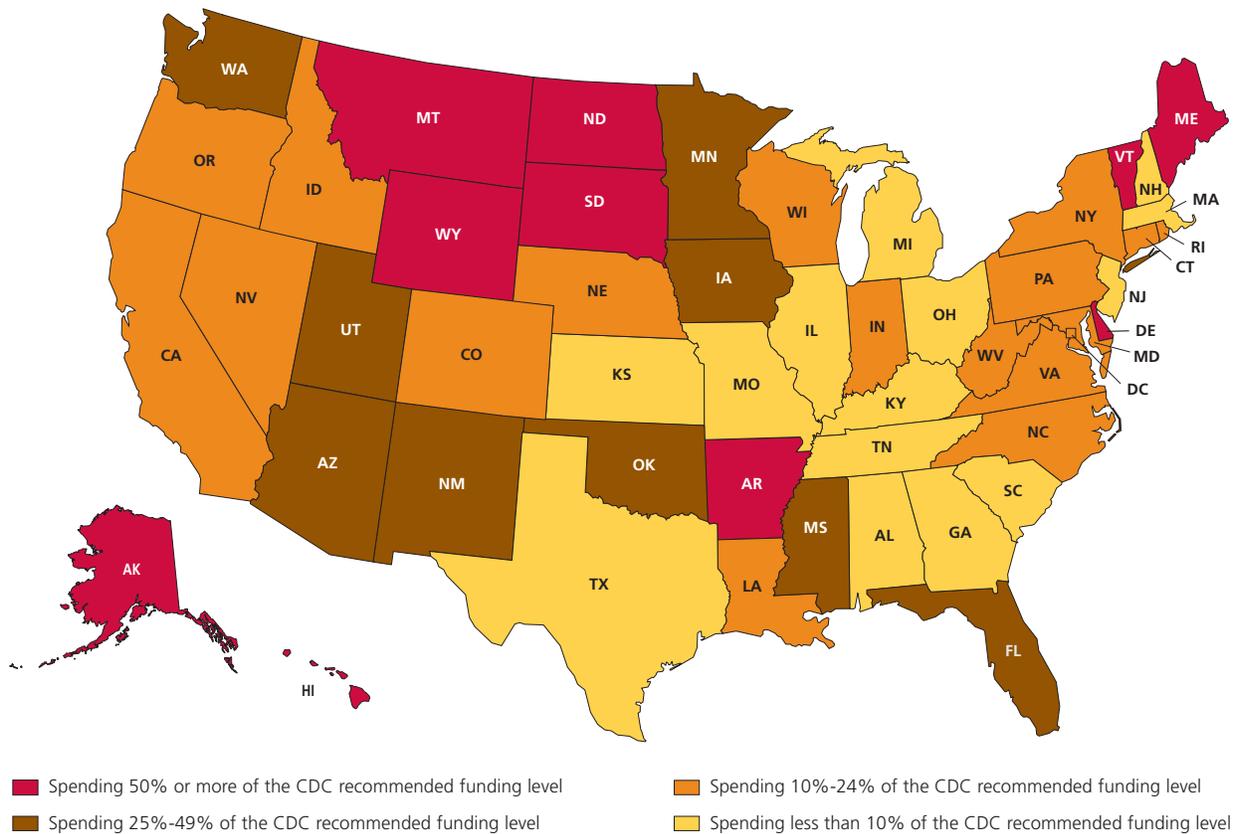
Even with such interventions, multiple attempts may be necessary before long-term quitting is achieved. Thus, it is critical for health care providers to continue to discuss tobacco cessation with their patients even if they have tried to quit and failed in the past. Health care providers can be especially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

Nationally, the receipt and use of recommended cessation services remains low. About 61% of smokers reported being advised by a physician to quit in the past year, and about 35% of smokers tried to quit using recommended tobacco dependence treatments, including pharmacotherapy and/or counseling.⁶⁸ The delivery and use of cessation services are strongly related to race/ethnicity and SES. For example, Hispanic and African American smokers are significantly less likely to receive these services, compared to non-Hispanic whites (Figure 1E). Insurance coverage and cost remain major barriers. Stable insurance coverage is associated with a regular source of health care, which increases access to cessation services. Smokers in most

race/ethnic groups without a regular source of care are significantly less likely to receive a physician’s advice to quit and use effective dependence treatments, compared to those with a regular source of care (Figure 1E). However, even insured smokers may not have access to cessation services. In some cases, coverage is extended only to certain groups of smokers. For example, Medicare only covers smoking cessation counseling and pharmacotherapy (excluding over-the-counter treatment) for seniors with illnesses caused or complicated by tobacco use, and some state Medicaid programs only cover treatments for pregnant women.^{69,70} Additionally, insured smokers may bear a significant portion of the cost of pharmacotherapy because of deductibles and co-payments, or in some cases because certain treatments are not covered at all.^{71,72}

- Among national surveys to assess health insurance coverage of any tobacco-dependence treatments, estimates range from 88% among health maintenance plans to 20% among employer-provided plans.^{73,74} State-specific estimates may be higher; in California, employer-sponsored coverage of any treatment increased from 44% in 2000 to 57% in 2005, while coverage for all forms of treatment increased from 11% to 22% in this time period.⁷⁵
- In 2007, Medicaid fee-for-service programs in 43 states covered one or more treatments for tobacco dependence (medication or counseling) for all recipients, up from 23 programs in 1998. Six states offer comprehensive coverage for all effective medication and counseling treatments. All except two of the states (New Mexico and New Jersey) providing some form of coverage had limitations on treatment coverage, including requiring co-payments, limiting duration of treatment, requiring prior authorizations, and requiring enrollment in behavioral modification to gain coverage for pharmacotherapy.⁷⁰

Figure 1F. Funding for Tobacco Prevention, by State, US, 2010



Source: Campaign For Tobacco-Free Kids, et al. A Decade of Broken Promises: The 1998 State Tobacco Settlement Eleven Years Later. 2008.

- According to the American Lung Association, in 2008 Rhode Island, New Mexico, and New Jersey required a majority of dependence treatments to be covered in all private health plans. Laws in Florida, Illinois, Indiana, and North Carolina have less stringent laws that only allow, but do not require, private plans to have cessation programs.⁷⁶
- In 2008, six states ensured that state employees received comprehensive coverage for all USPHS-recommended medication and counseling treatments, while 44 states and the District of Columbia provided coverage for any pharmacotherapy or counseling.⁷⁶

Another strategy to facilitate cessation is to integrate population-wide cessation services, including physician outreach and education, quit smoking clinics, and free distribution of nicotine replacement therapy, into comprehensive tobacco control programs. Providing such services in New York City was associated with greater utilization of cessation services and greater quit rates.⁷⁷ In addition, statewide telephone quitlines have a broad reach and can deliver effective behavioral counseling to diverse groups of tobacco users, including low-income, rural, elderly,

uninsured, and racial/ethnic subpopulations of smokers.⁶⁵ Recent studies show that integrating standard nicotine replacement therapies into state quitlines can improve quit rates and are cost effective.⁷⁸ By 2008, a national service (1-800-QUITNOW), along with all 50 states, the District of Columbia, and five territories, offered some degree of telephone cessation counseling.^{35, 79}

The American Cancer Society Quit for Life Program® (1-800-227-2345), operated and managed by Free & Clear®, has helped more than 800,000 tobacco users make a plan to quit completely. The program reaches 28 states and nearly 400 employers and health plans. For more than three decades, the Society has designated the third Thursday in November as the Great American Smoke-out®, a day to raise consciousness about the benefits of stopping smoking and for smokers nationwide to give up cigarettes for at least a day in the hope they might stop smoking completely. (For more information, refer to cancer.org/docroot/subsite/greatamericans/content/All_About_Smokeout.asp or call 1-800-227-2345.) In addition, a US Department of Health and Human Services Web site (smokefree.gov) offers online advice and downloadable information on quitting.

Funding for Tobacco Control

Since the Master Settlement Agreement (MSA) with 46 states in 1998, tobacco companies have increased their cigarette advertising and promotional expenditures by 87%, from \$6.7 billion in 1998 to \$12.49 billion in 2006, and even higher in the intervening years.⁴⁹ By comparison, states spent very little to counter these promotional efforts. Since 2000, the industry has progressively increased its promotional spending relative to tobacco control spending. In 2006, for every dollar spent in the US on tobacco control efforts, the industry spent about \$23 to promote its products, up from a \$14-to-\$1 ratio in 2000.

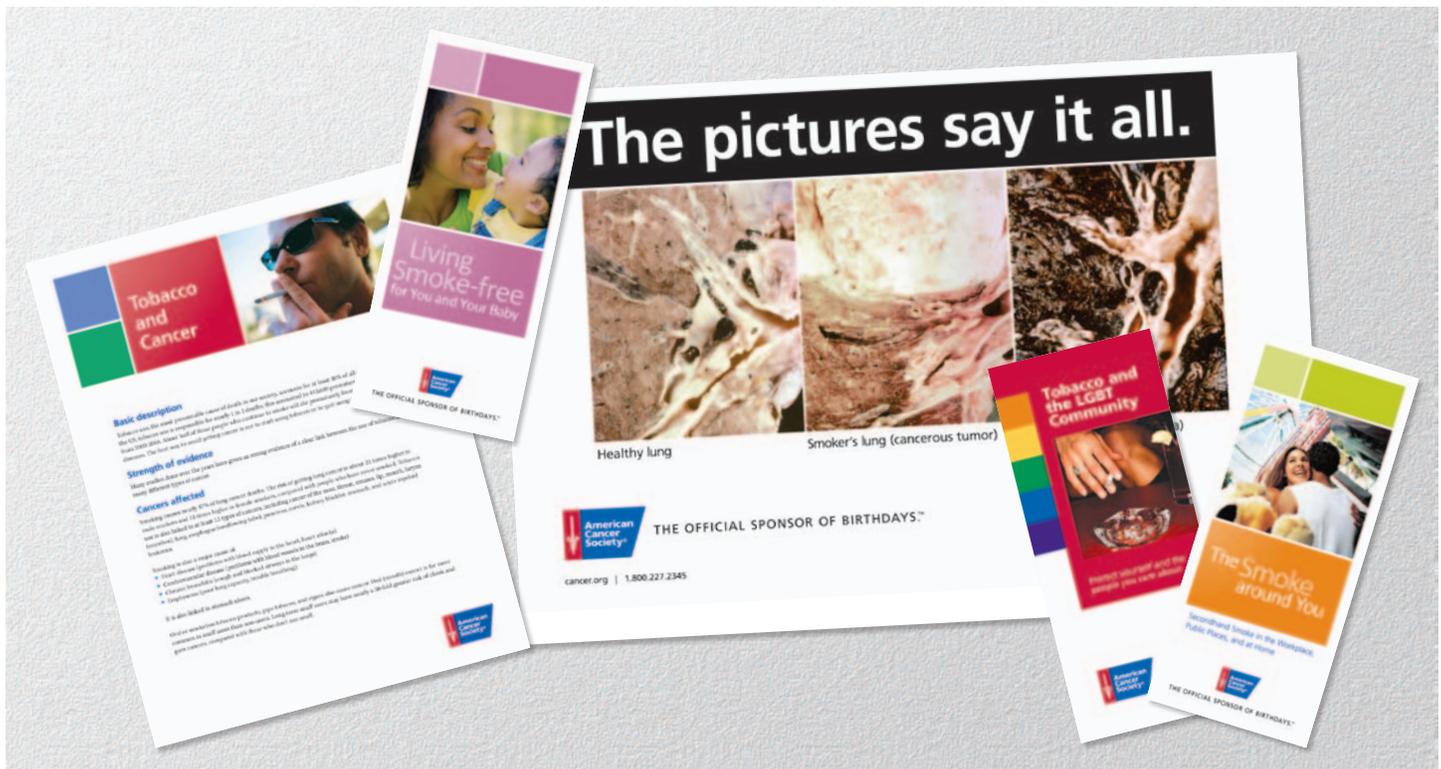
Recent research indicates that increased spending on tobacco control by states is associated with lower youth and adult smoking prevalence.^{80, 81} However, several of the most effective comprehensive tobacco control programs in the nation have now been jeopardized by severe budget cuts as a result of state budget deficits and other political pressures. States that have experienced funding cuts have seen increases in adolescent susceptibility to smoking, smoking intentions, and increases in the illegal sales of tobacco products to minors.^{82, 83}

One of the recommendations of the Institute of Medicine report in 2007 was support for the creation and sustainability of state-level comprehensive tobacco control programs funded at levels recommended by the Centers for Disease Control and Prevention (CDC) and commensurate with the state's population, demog-

raphy, and tobacco use prevalence.⁴⁰ The CDC-recommended funding levels for state tobacco control programs range from \$9.23 to \$18.02 per capita across all 50 states and the District of Columbia.³⁵ Funding all state tobacco control programs at levels recommended by the CDC for five years could result in an estimated 5 million fewer smokers in the US.³⁵

- In 2010, states allocated \$642.3 million for tobacco control programs.⁸⁴ This amount represents a drop of 15.4% from the amount spent in 2009, including cuts to funding in 34 states and the District of Columbia.
- The amount allocated in 2010 constitutes just 17% of the CDC recommendation for the minimum level of tobacco control funding. Only North Dakota met its minimum CDC-recommended funding level. Nine other states fund tobacco control programs at least half their minimum recommended levels while the remaining 40 states and the District of Columbia fund at less than half their minimum recommended amount (Figure 1F).⁸⁴
- In 2010, states' revenue from tobacco taxes and the MSA with the tobacco companies is projected to be \$25.1 billion.⁸⁴ However, only 2.6% of this amount has been allocated for tobacco control funding. Among states' allocation of revenue to tobacco control, Michigan and Tennessee ranked the lowest (0.3%) and North Dakota ranked the highest (16.1 %) (Table 1D).

Tobacco control materials available from the American Cancer Society



Overweight and Obesity, Physical Activity, and Nutrition

Obesity, physical inactivity, and poor nutrition are major risk factors for cancer, second only to tobacco use.⁸⁵ Approximately one-third of the more than 500,000 cancer deaths in the US this year can be attributed to poor diet and physical inactivity, while another third is caused by use of tobacco products. Although genetic inheritance plays a role in the risk of some individuals developing cancer, non-inherited factors have a larger impact on cancer risk for the population as a whole. Avoiding the use of tobacco products, exposure to secondhand smoke, maintaining a healthy weight, staying physically active throughout life, and consuming a healthy diet can substantially reduce a person's lifetime risk of developing cancer (as well as cardiovascular disease).⁸⁶

Based upon a comprehensive review of current evidence, the American Cancer Society has published guidelines on nutrition and physical activity for cancer prevention.⁸⁷ These guidelines contain recommendations regarding individual choices related to weight control, physical activity, and diet, as well as community action to create a physical and social environment that promotes healthy behaviors.

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

Individual choices

Maintain a healthy weight throughout life.

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

Adopt a physically active lifestyle.

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

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

Individual Choices

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

1. Maintain a healthy weight throughout life.

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

Body Weight and Cancer Risk

In the US, overweight and obesity contribute to 14%-20% of all cancer-related deaths. (For definitions of overweight, obesity, and extreme obesity see sidebar, page 18.) Overweight and obesity are clearly associated with an increased risk for developing many cancers, including cancer of the breast (postmenopausal), colon, endometrium, esophagus, and kidney. In addition, observational studies show that obesity increases the risk for cancers of the pancreas, gallbladder, thyroid, ovary, and cervix, and for multiple myeloma, Hodgkin lymphoma, and aggressive prostate cancer.⁸⁸ The link between body weight and cancer risk is believed to stem from multiple effects on fat and sugar metabolism, immune function, level of hormones (including insulin and estradiol), and cell growth.⁸⁸ Although knowledge about the relationship between weight loss and cancer risk is still limited, recent studies suggest

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

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

If you drink alcoholic beverages, limit consumption.

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

Community Action

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

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

Defining Body Mass Index

For adults, this sidebar relates body mass index (BMI) to pounds and inches. For example, a 5-foot-4-inch woman is considered overweight if she weighs between 145 and 173 pounds. She is considered obese if she weighs 174 pounds or more. A 5-foot-10-inch man is considered overweight if he weighs between 174 and 206 pounds and obese if he weighs 207 pounds or more.

Height (feet, inches)	Body weight (pounds)		
	Overweight*	Obese†	Extremely Obese‡
6'4"	205	246	328
6'3"	200	240	319
6'2"	194	233	311
6'1"	189	227	302
6'0"	184	221	294
5'11"	179	215	286
5'10"	174	207	278
5'9"	169	203	270
5'8"	164	197	262
5'7"	159	191	255
5'6"	155	186	247
5'5"	150	180	240
5'4"	145	174	232
5'3"	141	169	225
5'2"	136	164	218
5'1"	132	158	211
5'0"	128	153	204
4'11"	124	148	198
4'10"	119	143	191

*Overweight is defined as BMI of 25-29.9 kg/m².

†Obesity is defined as BMI of 30 kg/m² or greater.

‡Extreme obesity is defined as BMI of 40 kg/m² or greater.

For children two years and older, BMI values are used as a screening tool for determining overweight and obesity and identifying possible weight problems. After a BMI value is calculated for a child based on his or her weight and height, the BMI number is plotted on the Centers for Disease Control and Prevention's (CDC) BMI for age- and gender-specific growth charts to obtain a percentile ranking.⁹³ The percentile indicates the relative position of the child's BMI number among children of the same sex and age. According to the CDC definitions, obesity in children is defined as a BMI at or above the sex- and age-specific 95th percentile BMI cutoff points, and overweight is defined as between 85th to less than the 95th percentile.⁹³

that losing weight may reduce the risk of breast cancer. In addition, surgery to treat morbid obesity has been shown to improve insulin sensitivity and hormone metabolism and reduce mortality from diabetes, heart disease, and cancer.^{89,90}

Health care professionals have an important role in helping patients control their body weight. Primary care physicians

should assist patients who are overweight or obese in managing and controlling their body weight and in counseling them about safe and effective weight loss and weight maintenance programs.^{88,91} The National Heart, Lung and Blood Institute's (NHLBI) guidelines on obesity⁹² offer clinicians an easily adaptable blueprint and tools for incorporating information about weight, nutrition, and physical activity into their discussions with patients, for assessing a patient's motivation to lose weight, and enabling patients in developing and implementing strategies for self-management and behavior change.^{88,91}

Obesity Trends

- More than two-thirds of Americans are overweight or obese.⁹⁴
- Between 1976-1980 and 1999-2000, the prevalence of obesity among adolescents aged 12 to 19 tripled from 5% to 15.5%. Increases occurred across race, ethnicity, and gender; non-Hispanic African American girls have the highest rates of overweight (Figure 2A). More recently, no changes in the prevalence of obesity were observed between 1999-2000 and 2007-2008 (18.1%), except for an increase among boys aged 6 to 19 in the heaviest weight categories (BMI for age at or above the 97th percentile).⁹⁵
- The percentage of US high school students who were obese in 2007 varied widely across states; Utah had the lowest proportion of obese adolescents (8.7%), and Mississippi the highest (17.9%).¹² (Table 2A provides additional overweight measures in certain cities.)
- The percent of obese adults aged 20 to 74 varied little from 1960-1962 to 1976-1980; in contrast, obesity rates more than doubled between 1976-1980 and 1999-2000 from 15.1% to 31%.
- In the past decade, obesity trends in women have remained relatively stable, from 33.4% in 1999-2000 to 35.5% in 2007-2008; among men, prevalence increased from 27.5% to 32.2% during this period.⁹⁶
- Non-Hispanic African American and Hispanic women have significantly higher rates of obesity than non-Hispanic white women, but such differences are not observed among men (Figure 2B).⁹⁴ These racial and ethnic disparities are generally consistent across states as well; in 2006-2008, obesity rates across states range from 23% to 45% among African Americans, 21% to 37% among Hispanics, and from 9% to 30% among whites.⁹⁷
- The increase in the rate of adults classified as extremely obese has significantly contributed to the increase in obesity rates in the past 25 years. Rates of extreme obesity among adults aged 20 to 74 years increased from 1.4% in 1976-1980 to 6.0% in 2007-2008.
- In 2008, the prevalence of obesity exceeded more than 20 percent in all states except Colorado (19.2%); the state with the highest obesity prevalence is Mississippi (33.4%) (Table 2B).

Examples of Moderate and Vigorous Physical Activity

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

Achieving and Maintaining a Healthy Weight

A healthy weight depends on a person's height. Weight recommendations are often determined by a measure known as body mass index (BMI). (See sidebar, page 18.) Cutoffs established by the World Health Organization define the healthy range of BMI to be 18.5 to 25.0 kg/m², the overweight range to be 25.0 to 29.9, and a BMI of 30.0 or higher as obese.

The best way to achieve and maintain a healthy body weight is to balance caloric intake with physical activity.^{85, 98} For individuals who are overweight, limiting consumption of foods and beverages high in calories, fat, and added sugars, as well as alcohol, can help reduce caloric intake. Eating smaller portion sizes will also help. High-calorie and low-nutrient foods should be replaced with vegetables and fruits, whole grains, beans, and lower-calorie beverages.

Healthy behavioral patterns are often established early in childhood. About half of youngsters who are overweight as children will remain overweight in adulthood; 70% of those who are overweight by adolescence will remain overweight as adults.⁹⁹ Unhealthy dietary patterns, physical inactivity, and excessive weight gain that begin during childhood often continue into adulthood and increase the risk of developing cancer, cardiovascular disease, diabetes, hypertension, and osteoporosis later in life.

2. Adopt a physically active lifestyle.

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

Benefits of Physical Activity

Physical activity acts in a variety of ways to reduce the risk of several types of cancer, including cancers of the breast, colon, prostate, and endometrium.⁸⁵ A physically active lifestyle also reduces the risk of other chronic diseases, such as heart disease, diabetes, osteoporosis, and hypertension.^{87, 100}

Types of Activity and Recommendations

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

Although the optimal intensity, duration, and frequency of physical activity needed to reduce cancer risk are unknown, evidence suggests that 45-60 minutes on 5 or more days of the week may be optimal based on studies of colon and breast cancer.⁸⁵ Other studies have shown that one hour of exercise on 5 or more days each week helps to prevent weight gain and obesity.^{87, 98} In addition to having a direct impact on reducing the risk of breast and colon cancers, physical activity may also have an indirect effect on reducing the risk of developing obesity-related cancers because of its role in helping to maintain a healthy weight.

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

However, men older than 40, women older than 50, and people with chronic illnesses and/or established cardiovascular risk factors should consult their physicians before beginning a vigorous physical activity program.

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

Current Physical Activity Level in Adolescents

- In 2007, 34.7% of US youth were physically active for at least 60 minutes on more than 5 days per week and 30.3% attended physical education classes daily (Table 2A).
- In 2007, 35.4% of US high school students reported watching three or more hours of television per day (Table 2A).

Current Physical Activity Level in Adults

- In 2008, 25.3% of adults reported no leisure-time physical activity. The percentage of adults reporting no leisure-time physical activity ranged from 18.1% in Minnesota to 32.5% in Mississippi (Table 2B).
- In 2007, 48.9% of adults reported engaging in moderate levels of activity and 27.7% in vigorous levels of physical activity (Table 2B).

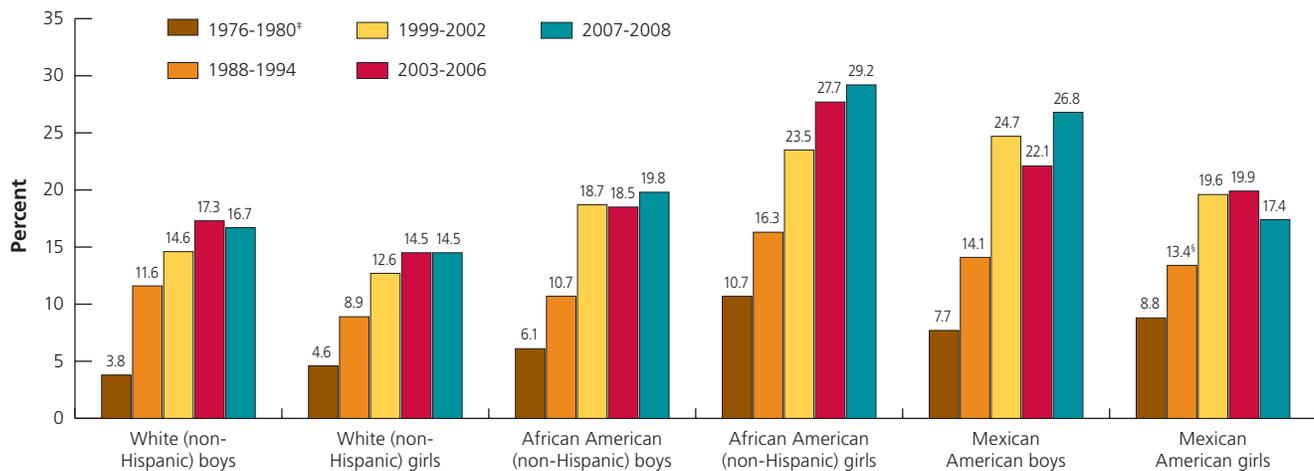
Physical activity plays an important role in the health and well-being of children and adolescents, and has important physical,

mental, and social benefits. Therefore, children and adolescents should be encouraged to be physically active at moderate to vigorous intensities for at least 60 minutes per day on 5 or more days per week.^{101, 102} The availability of routine, high-quality physical education programs is a recognized and critically important way of increasing physical activity among youth. Daily physical education and activities should be provided for children at school, and sedentary activities (e.g., watching television, playing video games) should be minimized at home.

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

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

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



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

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

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

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

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

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

Limit consumption of processed and red meats.

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

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

What Counts as a Serving

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

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

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

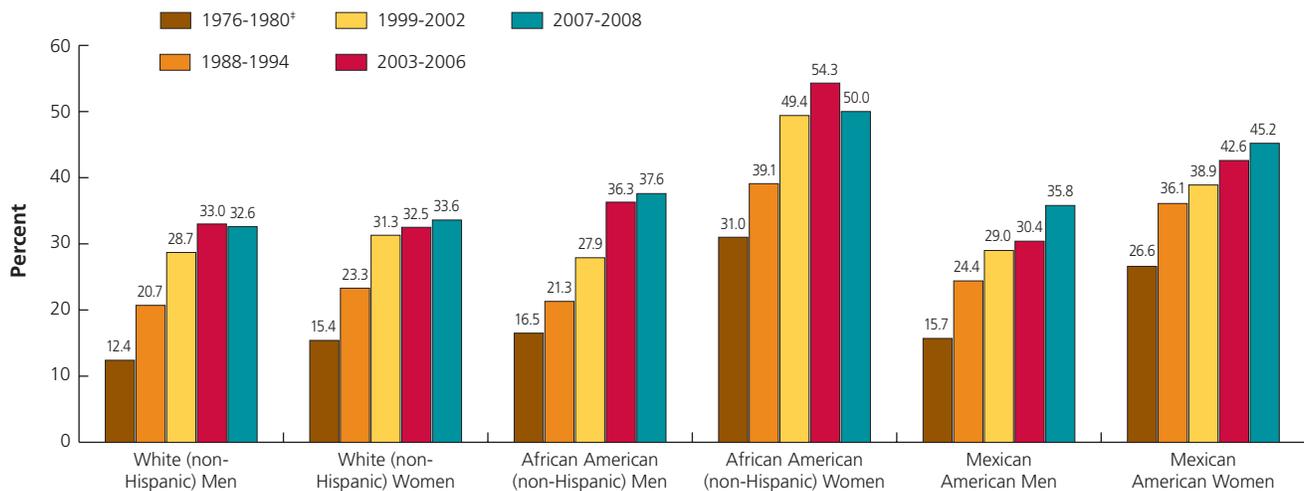
Beans and nuts: ½ cup of cooked dry beans; 2 tablespoons of peanut butter; ⅓ cup of nuts

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

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

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

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



*Body mass index of 30.0 kg/m² or greater. Age adjusted to the 2000 US standard population. †Persons of Mexican origins may be of any race. Data estimates for white (non-Hispanic) and African American (non-Hispanic) races starting in 1999 data may not be strictly comparable with estimates for earlier years because of changes in Standards for Federal Data on Race and Ethnicity. ‡Data for Mexican Americans are for 1982-84.

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

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Table 2A. Overweight, Obesity, and Related Factors, High School Students, by State and City, US, 2007

	% Overweight*	% Obese [†]	Rank [‡]	% Watched three or more hours per day of television [§]	% Met currently recommended levels of physical activity [¶]	% Attended physical education classes daily	% Played on one or more sports teams#	% Ate fruits and vegetables five or more times a day**
United States	15.8	13.0		35.4	34.7	30.3	56.3	21.4
State								
Alaska	16.2	11.1	10	23.0	42.5	17.7	61.7	15.7
Arizona (Including Charter Schools)	14.2	11.7	17	28.2	32.0	26.9	46.0	17.1
Arkansas	15.8	13.9	31	34.3	42.0	31.3	51.1	13.3
Connecticut	13.3	12.3	21	30.1	45.1	N/A	N/A	21.5
Delaware	17.5	13.3	28	39.0	40.4	28.3	55.0	N/A
Florida	15.2	11.2	15	40.2	38.4	23.0	49.8	22.1
Georgia	18.2	13.8	29	43.1	43.8	34.3	51.9	19.0
Hawaii	14.3	15.6	35	32.9	34.3	7.8	N/A	17.2
Idaho	11.7	11.1	11	22.0	46.8	32.0	57.6	17.4
Illinois	15.7	12.9	26	35.0	43.5	47.3	58.0	21.1
Indiana	15.3	13.8	30	28.7	43.7	25.2	57.0	18.2
Iowa	13.5	11.3	16	24.9	49.9	20.0	65.4	18.9
Kansas	14.4	11.1	12	25.9	45.1	25.7	59.4	20.8
Kentucky	16.4	15.6	36	27.4	32.9	20.0	48.6	13.2
Maine	13.1	12.8	24	23.6	43.1	6.7	N/A	20.4
Maryland	15.2	13.1	27	41.9	30.6	15.6	54.3	19.0
Massachusetts	14.6	11.1	13	28.4	41.0	18.2	59.5	N/A
Michigan	16.5	12.4	22	32.6	44.0	29.8	N/A	17.0
Mississippi	17.9	17.9	39	47.4	36.1	23.4	53.4	19.4
Missouri	14.3	12.0	20	29.6	43.5	24.1	56.5	18.1
Montana	13.3	10.1	5	22.2	44.9	32.8	59.6	17.1
Nevada	14.5	11.0	9	35.1	46.2	N/A	N/A	19.0
New Hampshire	14.4	11.7	18	25.1	46.9	17.2	57.1	22.3
New Mexico	13.5	10.9	7	27.9	43.6	29.8	N/A	17.9
New York	16.3	10.9	8	35.3	38.0	13.1	55.3	N/A
North Carolina	17.1	12.8	25	35.3	44.3	29.0	N/A	14.8
North Dakota	13.7	10.0	4	25.0	47.8	N/A	N/A	16.6
Ohio	15.0	12.4	23	32.0	44.7	26.2	56.7	15.5
Oklahoma	15.2	14.7	33	33.3	49.6	34.3	58.6	15.7
Rhode Island	16.2	10.7	6	27.4	41.9	23.1	N/A	19.0
South Carolina	17.1	14.4	32	38.6	38.0	23.1	49.7	17.1
South Dakota	14.5	9.1	2	23.8	44.0	14.5	63.1	16.0
Tennessee	18.1	16.9	38	38.3	42.0	30.4	51.9	18.3
Texas	15.6	15.9	37	38.5	45.2	40.5	57.7	17.4
Utah	11.7	8.7	1	18.2	47.5	29.9	67.1	17.7
Vermont	14.5	11.8	19	N/A	48.0	18.6	N/A	23.8
West Virginia	17.0	14.7	34	32.0	42.8	25.5	51.8	19.8
Wisconsin	14.0	11.1	14	25.4	38.3	N/A	N/A	17.9
Wyoming	11.4	9.3	3	20.8	48.2	21.9	59.8	17.3
City								
Baltimore, MD	19.9	18.5	21	59.5	33.4	20.8	46.1	22.5
Boston, MA	18.5	14.5	11	40.1	29.7	6.5	49.9	N/A
Broward County, FL	15.4	8.4	1	40.7	32.8	21.6	49.3	23.1
Charlotte-Mecklenburg, NC	16.5	9.8	4	37.2	43.2	21.8	N/A	N/A
Chicago, IL	18.7	15.8	14	45.2	28.8	43.6	51.6	20.4
Dallas, TX	19.0	19.3	22	50.8	33.4	25.9	49.6	17.9
DeKalb County, GA	16.3	13.1	10	52.3	35.7	28.2	52.8	21.0
Detroit, MI	21.3	18.4	20	60.0	30.4	30.8	N/A	16.9
District of Columbia	17.8	17.7	18	52.5	30.2	16.3	50.3	19.3
Hillsborough County, FL	13.6	11.5	5	34.2	34.4	21.1	47.7	18.4
Houston, TX	17.7	16.7	17	42.8	28.9	14.4	52.5	17.1
Los Angeles, CA	22.2	16.5	16	43.8	42.1	50.5	50.9	27.4
Memphis, TN	19.7	16.2	15	60.5	36.1	32.4	53.2	21.8
Miami-Dade County, FL	15.0	13.0	9	45.4	32.4	10.8	46.0	23.6
Milwaukee, WI	19.0	17.7	19	49.4	28.1	27.7	N/A	21.6
New York City, NY	16.3	11.5	6	48.4	39.2	42.3	42.1	N/A
Orange County, FL	14.4	12.6	8	41.0	35.6	16.1	47.5	20.9
Palm Beach County, FL	12.5	8.5	2	37.8	36.4	18.6	48.9	22.8
Philadelphia, PA	18.4	15.2	13	50.6	31.1	23.8	44.3	18.0
San Bernardino, CA	18.3	15.0	12	46.3	48.5	54.0	52.8	28.8
San Diego, CA	15.1	12.3	7	37.9	46.2	41.3	54.5	20.4
San Francisco, CA	12.5	8.5	3	33.2	33.8	36.0	41.7	N/A

*Body mass index at or above the 85th percentile but below the 95th percentile of growth chart for age and sex. Previous CPED reports used the term "at risk for overweight" to describe youth in this BMI category. †Body mass index at or above the 95th percentile of growth chart for age and sex. Previous CPED reports used the term "overweight" to describe youth in this BMI category. ‡Rank is based on % Obese. §During an average school day. ¶Were physically active doing any kind of physical activity that increased their heart rate and made them breathe hard some of the time for a total of at least 60 minutes/day on >5 of the 7 days preceding the survey. #During the 12 months preceding the survey. **Had consumed 100% fruit juice, fruit, green salad, potatoes (excluding French fries, fried potatoes, or potato chips), carrots, or other vegetables >5 times/day during the seven days preceding the survey. N/A = Data not available. **Note:** Data are not available for all states since participation in the Youth Risk Behavior Surveillance System is a voluntary collaboration between a state's departments of health and education.

Source: Youth Risk Behavior Surveillance System, 2007, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention. *MMWR Morb Mortal Wkly Rep.* 2008;57(SS-4).

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Control portion size to achieve and maintain a healthy weight.

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

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

Vegetables and Fruits

Vegetables (including legumes) and fruits contain numerous vitamins, minerals, fiber, carotenoids, and other bioactive substances that may help prevent cancer. Greater consumption of vegetables and fruits is associated with decreased risk of lung, esophageal, stomach, and colorectal cancer.¹⁰³ Limited data are currently available for other types of cancers, although research is ongoing. The potential benefits of vegetable and fruit consumption may also stem from their replacement of other, more calorie-dense foods and associated maintenance of a healthy weight.

For these reasons, consumption of low-calorie, whole vegetables and fruits has been encouraged by a number of health organizations.^{98, 100} However, intake of these foods remains low among American adults and children, perhaps due to reasons such as lack of access to affordable produce, preparation time, and taste preferences. Recommendations for cancer risk reduction are to consume at least 5 servings of a variety of vegetables and fruits each day; however, for overall health, the American Cancer Society supports the recommendation to consume higher levels, depending on calorie needs, as stated in the US Department of Health and Human Services' *Dietary Guidelines for Americans*.⁹⁸

Current Prevalence of Consuming Vegetables and Fruits in Adults and Adolescents

- About one in five (21.4 %) US high school students ate vegetables and fruits 5 or more times per day in 2007 (Table 2A).
- Only 24.7% of adults reported eating 5 or more servings of vegetables or fruit daily in 2007. Across states, prevalence of consuming 5 or more servings of vegetables or fruit ranged from 16.3% in Oklahoma to 32.5% in the District of Columbia (Table 2B).

Whole Grains

Grains such as wheat, rice, oats, and barley, and the foods made from them, are an important part of a healthful diet. Whole-grain foods (made from the entire grain seed) are relatively low in caloric density and higher in fiber, certain vitamins, and minerals than processed (refined) flour products.⁹⁸ Although the association between whole-grain foods and different types of cancer has been inconsistent, consumption of high-fiber foods is associated with a lower risk of several chronic diseases (e.g., diabetes, cardiovascular disease) and is therefore recommended for the benefit of overall health.⁹⁸

Processed and Red Meats

Numerous studies have examined the relationship between cancer and the consumption of red meats (beef, pork, or lamb) and processed meats (cold cuts, bacon, hot dogs, etc.), and current evidence supports an increased risk of cancers of the colon and/or rectum and prostate.⁸⁶ Although meats are good sources of high-quality protein and can supply many important vitamins and minerals, they remain major contributors of total fat, saturated fat, and cholesterol in the American diet. Additionally, heavy meat consumption may lead to the exposure to certain substances that could increase the risk of cancer. In particular, meat that has been fried and/or charcoal-grilled at a very high temperature can produce carcinogenic substances (heterocyclic amines). Substances such as nitrates or nitrites used in processed meats can also contribute to the formation of nitrosamines, which are involved in carcinogenesis.

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

4. If you drink alcoholic beverages, limit consumption.

People who drink alcohol should limit their intake to no more than two drinks per day for men and one drink a day for women.⁹⁸ The recommended limit is lower for women because of their smaller body size and slower metabolism of alcohol. A drink of alcohol is defined as 12 ounces of beer, five ounces of wine, or 1.5 ounces of 80-proof distilled spirits.

Alcohol consumption is an established cause of cancers of the mouth, pharynx, larynx, esophagus, and liver.^{86, 104} For each of these cancers, risk increases substantially with the intake of more than two drinks per day.^{86, 104} Alcohol consumption combined with tobacco use increases the risk of cancers of the mouth, larynx, and esophagus far more than the independent effect of either drinking or smoking.⁸⁶ Extensive evidence also implicates alcohol consumption as a cause of cancer of the breast, and probably colon and rectum cancer.⁸⁶ Reducing alco-

Table 2B. Overweight, Obesity, and Related Factors, Adults 18 and Older, by State, US, 2007, 2008

	2008				2007			
	% Clinical overweight (25.0-29.9 kg/m ²)	% Clinical obese (30.0 kg/m ² or greater)	% Overweight or obese (25.0 kg/m ² or greater)	Rank*	% No leisure-time physical activity	% Vigorous physical activity [†]	% Moderate physical activity [‡]	% Eating five or more fruit or vegetable servings a day
Alabama	35.7	32.3	68.0	49	29.5	21.7	41.7	20.6
Alaska	38.2	27.2	65.4	38	24.1	39.5	60.9	24.3
Arizona	35.8	25.7	61.5	13	23.1	29.6	52.5	28.3
Arkansas	36.1	29.6	65.8	42	29.7	24.4	46.0	21.8
California	37.1	24.3	61.4	12	23.3	31.3	50.2	28.9
Colorado	36.2	19.2	55.4	2	18.9	33.0	54.7	25.8
Connecticut	38.4	21.6	59.9	7	22.5	30.4	52.5	28.4
Delaware	36.1	27.7	63.8	31	24.1	26.8	48.0	21.4
District of Columbia	32.9	22.3	55.2	1	21.2	30.8	53.9	32.5
Florida	35.0	25.2	60.3	10	25.9	26.0	47.3	26.2
Georgia	36.9	27.9	64.8	36	23.1	28.2	48.3	25.0
Hawaii	34.3	23.2	57.5	3	19.5	30.5	51.1	28.6
Idaho	37.0	25.2	62.2	21	21.1	33.4	55.7	22.2
Illinois	36.4	26.9	63.2	25	28.0	28.3	48.7	24.6
Indiana	36.8	26.9	63.7	29	27.7	26.5	47.7	22.8
Iowa	37.6	26.7	64.3	33	25.1	25.1	48.5	19.9
Kansas	37.5	28.1	65.6	40	25.5	25.8	48.5	18.8
Kentucky	36.5	30.4	66.8	46	30.5	21.8	44.3	18.3
Louisiana	34.8	29.0	63.8	30	29.8	20.5	38.6	19.6
Maine	35.9	25.9	61.9	17	22.8	31.9	56.0	28.6
Maryland	36.7	26.7	63.4	27	24.0	27.9	48.3	26.4
Massachusetts	36.6	21.5	58.1	4	22.1	29.8	51.5	27.5
Michigan	35.2	29.6	64.7	35	25.1	29.6	50.7	21.3
Minnesota	37.6	25.2	62.8	23	18.1	22.8	48.9	19.4
Mississippi	34.1	33.4	67.5	48	32.5	19.7	39.6	18.0
Missouri	36.4	29.1	65.5	39	27.6	25.4	48.8	20.1
Montana	37.4	24.3	61.7	16	23.1	32.7	57.9	25.2
Nebraska	36.9	27.2	64.1	32	24.7	30.6	52.0	24.1
Nevada	37.0	25.8	62.7	22	27.6	28.3	48.9	21.9
New Hampshire	38.2	24.9	63.1	24	21.5	31.2	54.1	28.5
New Jersey	38.5	23.7	62.1	19	27.0	27.5	48.2	27.4
New Mexico	34.2	25.7	60.0	8	23.9	29.2	53.3	22.4
New York	35.2	25.2	60.4	11	26.3	27.5	48.9	27.6
North Carolina	36.2	29.6	65.8	41	24.7	23.4	44.1	21.6
North Dakota	39.6	27.8	67.4	47	25.5	28.8	52.7	21.9
Ohio	34.1	29.3	63.4	26	26.0	28.1	49.9	20.7
Oklahoma	35.5	31.0	66.5	45	31.5	24.9	45.4	16.3
Oregon	36.7	25.0	61.6	14	19.0	31.5	56.3	27.0
Pennsylvania	36.0	28.4	64.4	34	25.8	28.6	50.4	25.4
Rhode Island	37.9	22.1	60.0	9	24.3	27.7	49.9	25.6
South Carolina	35.2	30.7	65.9	43	27.2	25.4	46.5	18.6
South Dakota	36.8	28.2	65.0	37	26.8	25.4	47.9	18.5
Tennessee	36.8	31.3	68.1	50	28.9	18.5	38.8	26.3
Texas	37.2	29.0	66.1	44	28.5	25.5	46.4	25.1
Utah	35.1	23.1	58.2	5	19.8	35.9	56.2	22.8
Vermont	35.3	23.2	58.5	6	19.4	33.2	57.6	30.0
Virginia	35.8	25.8	61.6	15	23.6	30.1	49.6	26.3
Washington	35.8	26.1	61.9	18	19.3	30.8	53.7	26.0
West Virginia	36.9	31.9	68.8	51	31.1	19.2	45.9	19.7
Wisconsin	37.5	26.1	63.6	28	22.0	32.2	55.1	24.3
Wyoming	37.0	25.2	62.2	20	24.3	32.7	56.8	24.4
United States [§]	36.3	26.7	63.0		25.3	27.7	48.9	24.7
Range	32.9-39.6	19.2-33.4	55.2-68.8		18.1-32.5	18.5-39.5	38.6-60.9	16.3-32.5

*Rank based on % overweight (25kg/m² 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.

Source: Behavioral Risk Factor Surveillance System Public Use Data Tape 2007, 2008, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2008, 2009.

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hol consumption may be an important way for many women to reduce their risk of breast cancer; in particular, women with a low intake of folate may be susceptible to the increase in breast cancer risk from alcohol. Overall, the evidence seems to indicate that total alcohol consumption is the important factor, not the type of alcoholic beverage consumed.

Complicating the recommendation for alcohol and cancer risk reduction is the fact that low to moderate intake of alcoholic beverages has been associated with decreased risk of coronary heart disease.¹⁰⁵ There is no compelling reason for adults who currently do not consume alcoholic beverages to start consuming alcohol to reduce their risk for heart disease because cardiovascular risk can be reduced by other means, such as not smoking, consuming a diet low in saturated and trans fats, maintaining a healthy weight, staying physically active, and controlling blood pressure and lipids. Some groups of people should not drink alcoholic beverages at all, including children and adolescents and individuals of any age who cannot restrict their drinking to moderate levels or who have a family history of alcoholism.

Community Action

The dramatic rise in obesity levels in the US in the past several decades has serious implications for public health and the economy.¹⁰⁰

In 2008, the medical costs for overweight and obesity were estimated to be \$147 billion (or 9.1% of US health care expenditures), with half these costs paid for publicly through the Medicare and Medicaid programs.¹⁰⁶ Experiences in tobacco control and other public health initiatives have shown that public policies and strategies may be powerful tools to effect structural change to alter population-level behavior.

Policies and programs that support healthy behaviors throughout the life cycle are needed to address the unsupportive socio-environmental factors contributing to increased obesity by reducing the individuals' opportunities to eat well and be physically active.^{87, 100, 101} Such socio-environmental factors include lack of access to full-service grocery stores, relatively high costs of healthy foods compared to processed foods, and lack of access to safe places to play and exercise.¹⁰⁰ Historical changes that likely contributed to the obesity epidemic include reduced leisure time for physical activity, shifts from using walking as a mode of transportation to increased reliance on automobiles, shifts to more mechanized or sedentary work, more meals eaten away from home, increased marketing and availability of cheap but energy-dense processed foods, and increased consumption of larger portion sizes.^{87, 100, 101}

Schools and child care facilities, workplaces, and health care facilities are important settings for the implementation of policies and programmatic initiatives. The appeal of setting-based

approaches includes the ability to implement effective strategies to target populations (i.e., students, employees, or patients) and to also influence social norms within the setting, with possible transfer to behavior outside of the setting through linkage with community-based prevention programs.¹⁰⁰ Evidence of promising setting-oriented strategies can be identified.⁸⁸ A specific evidence-based example is the Clinic Community Intervention Project, instituted by the Center of Excellence in Obesity at Thomas Jefferson University.⁸⁸ This exemplary programmatic initiative uses the Chronic Care Model in the management of obesity in adults. In the application of this model, the effective clinical management of obesity requires that clinical practices be organized to facilitate provider compliance with clinical care guidelines and to assist participants in developing and implementing strategies for behavior changes. In addition, the patient support component includes a clinic-based lifestyle counselor with links to community-based programs designed to assist patients to develop healthy lifestyles through improvements in diet, physical activity, and planned exercise.⁸⁸

Many experts and governmental and nongovernmental organizations recognize that obesity is a complex problem that requires a broad range of effective approaches.^{87, 100, 101} The American Cancer Society believes that while educating the public about healthy behaviors is important to help them stay well, creating environments that make it easier for people to make healthy choices is critical if widespread changes are to be seen at a population level.¹⁰⁷ Thus, the Society's nutrition and physical activity guidelines call attention to community action strategies that can increase access to healthy food or provide safe, enjoyable, and accessible environments for physical activity in all community settings (e.g., schools, workplaces). (See sidebar, page 26.)

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

Community Action Strategies

There are multiple ways that public and private organizations at the local, state, and national levels can develop policies and allocate or expand resources to facilitate necessary changes. Schools can ensure that students participate in physical activity programs and promote the availability of healthful food and beverages. Employers can implement worksite health promotion programs. Health care professionals can advise and assist their patients on effective weight loss programs. At the state and local level, community leaders, in particular, can promote policy changes that may include regulation of the school food environment, zoning changes, and tax incentives that bring

food stores into poor neighborhoods, and the creation of safe spaces that promote physical activity. A growing number and variety of policies are being implemented at the local and state levels of government that are intended to promote healthy eating and active living; many of these policies have targeted the food environment and activity requirements in schools.¹⁰⁷ The Centers for Disease Control and Prevention (CDC) and several nongovernmental organizations recently developed the Common Community Measures for Obesity Prevention Project (the Measures Project). The project team developed 26 measures and a web-based tool that local governments can use to plan and measure their progress toward implementing and monitoring their local obesity prevention initiatives.¹⁰⁷

The CDC,¹⁰⁸ the Institute of Medicine,¹⁰¹ the World Health Organization,¹⁰⁵ and others⁸⁶ have outlined a variety of evidenced-based approaches in schools, worksites, and communities to halt and ultimately reverse obesity trends. The following are some specific approaches that have been proposed.^{99, 101, 107, 108} (See sidebar, below.)

On February 9, 2010, First Lady Michelle Obama announced a new nationwide campaign to improve the health of children by promoting healthier diets and more physical activity. The Let's Move campaign will take a comprehensive approach by engaging the public and private sectors and will include four core areas – healthy choices, healthier schools, physical activity, and accessible and affordable healthy food.

Through recent efforts, the federal government has allocated funds for community prevention programs. On September 17, 2009, the US Department of Health and Human Services announced cornerstone funding of \$373 million from the American Recovery and Reinvestment Act's Community Prevention and Wellness Initiative. Led by the CDC, the Communities Putting Prevention to Work initiative will award grants to communities for comprehensive public health initiatives. The cooperative agreements will support evidence-based prevention strategies and programs for youth and adults. The goal of Communities Putting Prevention to Work is to change systems and environments – for example, improving access to healthy foods and opportunities for physical activity – and to establish policies, such as smoke-free air laws, that will promote the health of all Americans.

To find out more about the Communities Putting Prevention to Work public health initiative, visit hhs.gov/recovery/programs/cdc/chronicdisease.html.

The CDC provides many resources that help states and communities make changes through policy and environmental approaches for healthy eating and physical activity. As of 2009, 23 states were funded through the CDC's Nutrition and Physical Activity and Obesity Program to coordinate statewide efforts with multiple partners to address obesity. The program's focus is on policy and environmental change initiatives directed toward promoting healthful eating and physical activity; for an example of such a program, see sidebar, page 27.

Strategies to Promote the Availability of Affordable, Healthy Food and Beverages

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

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

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

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

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

Strategies to Encourage Communities to Organize for Change

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

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

The Society works in many ways to increase awareness of the importance of weight control, physically active lifestyles, and healthy diets to reduce the risk of cancer and other chronic diseases, as well as to help facilitate changes in schools, worksites, and communities that make it easier for people to make healthier choices.⁸⁷

Building Healthy Communities Project

Michigan's Building Healthy Communities Project is designed to improve the environment and change policies to make it easier for residents to be healthy. The project expanded from an initial state-funded competitive grant to seven local public health departments to a wider partnership that now includes 16 local public health departments. Multidisciplinary coalitions were formed from new and existing local partners representing transportation, farmers, residents, public officials, zoning and planning, city engineers, law enforcement, YMCA, hospitals, universities, nonprofit organizations (including the American Cancer Society Great Lakes Division), and news media outlets.

Communities determined their needs utilizing assessment tools found at mihealthtools.org, which included the Healthy Communities Checklist, the Promoting Active Communities (PAC) Assessment, the Nutritional Environmental Assessment Tool (NEAT), and Smoke-Free Community Assessment Tool (SFCAT). Multiple evidence-based strategies and promising practices were implemented in communities to support physical activity and healthy eating. As a result, the Building Healthy Communities Project created and enhanced places for people in Michigan to enjoy healthy lifestyles. Examples of policy and built-environment changes for the project include:¹⁰⁹

- Eleven trails covering 58.6 miles were created or enhanced with benches, lighting, and signage.
- Seven parks were enhanced with amenities such as new equipment, benches, and lighting.
- Fourteen thousand walking maps were provided to residents
- One hundred twenty-nine community fitness classes were conducted.
- Five new farmers market locations opened. All markets have the ability to process electronic benefits transfer (EBT) transactions for food stamp recipients.
- Seven new school and community gardens were created.
- Five thousand senior project FRESH coupon books were distributed to low-income seniors to redeem for fresh fruits and vegetables.

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

- The American Cancer Society Great American Health Challenge (cancer.org/greatamericans) is a year-round campaign that provides tips, tools, and resources to help motivate and enable people to make better decisions about their daily eating and exercise habits.
- Through its Corporate Initiative, the Society works with companies throughout the country to improve their wellness offerings to employees, including initiatives that promote physical activity and healthy eating, as well as those that enable employers to create a healthier workplace environment.
- To promote healthy lifestyles among youth, the Society works with partners to increase the capacity of school systems to address K-12 health education, which includes increasing student knowledge and skills related to good nutrition, lifelong physical activity, and tobacco avoidance. The Society publishes the National Health Education Standards (NHES) and has been a leader in professional development to advance the implementation of NHES by states and local school districts.
- The Society advocates improving school nutrition standards and promoting physical education requirements in schools. Together with the American Diabetes Association and the American Heart Association, the Society released statements of support for policy changes at state and local levels that promote quality health education and physical education in schools.
- ACS CAN currently collaborates with the National Alliance on Nutrition and Activity Campaign to End Obesity, Safe Routes to School National Partnership, and Preventive Health Partnership (the American Cancer Society, American Heart Association, and the American Diabetes Association) among others, to advance state and local policies to improve access to healthy nutritional options and more opportunities for physical activity.
- The Society also advocates and supports efforts that provide consumers with the information they need to make informed decisions about what they eat. Restaurant menus and menu boards in restaurant chains offer a significant opportunity to inform consumers and promote awareness for making healthy eating choices. Thus, ACS CAN advocates for providing nutritional information on menus and menu boards (including drive-thru menu boards or food-tag items). At a minimum, the nutritional information should provide calorie information for consumers to see when ordering their food or drinks and a statement explaining average daily calorie intake. Calorie information should be displayed next to the item in the same size and typeface as the name and price of the item.

Ultraviolet Radiation and Skin Cancer

The vast majority of skin cancers are caused by unprotected exposure to excessive ultraviolet radiation (UVR), primarily from the sun.^{110, 111} Stratospheric ozone depletion has exacerbated these health effects by allowing increased UVR to reach the Earth's surface.¹¹² While UVR exposure is associated with a small percentage of all cancer deaths,^{110, 113} 68,130 new cases of melanoma will be diagnosed this year and more than 2 million basal cell and squamous cell skin cancers are diagnosed annually.¹ Most skin cancer deaths are due to melanoma (8,700 deaths expected in 2010). Melanoma is primarily a disease that afflicts whites; rates are more than 10 times higher in whites than in African Americans. The incidence of melanoma in the US has been increasing for at least 30 years.¹ It is widely thought that the increase in skin cancer over the past few decades is the consequence of changes in behavior that have resulted in increased exposure to solar UVR and use of indoor tanning booths by white young adult women.^{113, 114}

Everyone is exposed to naturally occurring solar UVR, although much of this exposure can be controlled. The extent of an individual's exposure to sunlight is determined by personal behaviors, particularly intentional exposure aimed at getting a tan (e.g., sunbathing). Environmental factors such as time of day, season, geographic location, altitude, temperature, and other weather conditions can also affect the amount of solar radiation individuals receive.¹¹⁵ A second source of exposure is artificial UVR emitted by devices (indoor tanning booths or lamps) that are increasingly available for cosmetic use and heavily promoted by the indoor tanning industry.¹¹⁶ The International Agency for Research on Cancer listed UV-emitting indoor tanning devices as carcinogenic to humans. Studies show that use of indoor tanning devices is a risk factor for skin cancer.^{114, 117, 118} An international comprehensive review reported that indoor tanning has no positive effect on health and found a 75% increase in melanoma risk among those who used indoor tanning booths in their teens and 20s.¹¹⁹ Thus, additional exposure to artificial UVR from indoor tanning is likely to enhance the well-known detrimental consequences of excessive solar UVR exposure.¹¹⁹

The negative effects of UVR are cumulative over a lifetime. The immediate adverse effects of excessive UVR exposure include sunburn, eye damage, and suppression of the immune system, while the long-term effects include premature aging of the skin, wrinkles, and skin cancer. Exposure to the sun or to other sources of UVR encompasses a large variety of individual behaviors; these behavioral patterns of UVR exposure generally have been grouped into two broad categories: intentional sun exposure and non-intentional sun exposure. Epidemiological studies show that cutaneous melanoma occurrence is more associated

with intentional sun exposure, which is motivated by the desire to acquire a tan by exposing significant portions of the trunk, shoulders, and limbs. Squamous cell carcinoma occurrence has been associated with non-intentional sun exposure situations, where individuals engaging in daily activities are in sunny outdoor environments but are not willingly acquiring a tan or intentionally spending a long time in the sun. Basal cell carcinoma occurrence has been associated with both types of sun exposure.¹²⁰

A small amount of solar UVR exposure is necessary for the production of vitamin D, which is essential for bone health.^{121, 122} There are two other ways to obtain vitamin D – dietary sources (particularly fortified milk and some cereals, oily fish, and eggs) and supplementation. The current national recommended daily intake of vitamin D is 200 IU to 600 IU.¹²³ Research is under way to improve the understanding of vitamin D levels and its health effects including the development of some cancers.¹²¹ More information about vitamin D and health is available online at cancer.org/docroot/ETO/content/ETO_5_3X_Vitamin_D.asp?sitearea=ETO.

Sunburns

Sunburns typically occur as a result of excessive sun exposure on unprotected or poorly protected skin.^{113, 115} They are characterized by skin redness (erythema), which occurs three to five hours after UVR exposure. Depending on the extent of UVR exposure, sunburns can range from mild to blistering and painful. Sunburns during childhood and intense intermittent sun exposure increase the risk of melanoma and other skin cancers later in life.¹²⁴⁻¹²⁶ A meta-analysis of 57 studies indicated a two-fold increased risk for melanoma among persons with a history of sunburn, compared to those without sunburn history.¹²⁷ In general, individuals with light skin pigmentation who do not tan easily are more susceptible to sunburns than those with darker skin. However, everyone is at risk for other UVR-related health effects.¹¹³

The prevalence of sunburns begins to rise through childhood and reaches a peak in adolescence and early adulthood.

An American Cancer Society study in 2004¹²⁸ showed that:

- More than two-thirds (68.7%) of youth reported getting sunburned during summer months.
- Sunburn rates were higher (84.5%) in youth with the most sensitive skin type (those who do not tan easily but burn when exposed to the sun). Also, higher sunburn rates were reported by girls (71.5%) and white youth (76.3%).

According to the 2005 National Health Interview Survey¹²⁹:

- Adult men were slightly more likely to report sunburns in the past year than women: 36.2% and 32.4%, respectively. Sunburn rates were also higher in non-Hispanic white men and women (44.2% and 38.5%, respectively) than in other racial-ethnic groups of men or women (about 16%).

- Among other racial and ethnic groups, the reported occurrence of sunburns in the past year varied widely: 30.8% in American Indians/Alaska Natives, 22.4% in Hispanics, and 18.2% in Asian Americans. Non-Hispanic African Americans had the lowest prevalence of sunburns (8.3%).

The susceptibility of the skin to UVR damage, including sunburns, is higher among individuals with fair skin, a family history of skin cancer, the presence of moles and freckles, or a history of severe sunburns.^{113, 125} To minimize the harmful effects of excessive and unprotected sun exposure, sun protection behaviors should be a lifelong practice. (See sidebar, opposite.)

UVR Exposure Behaviors

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

Studies show that many adults and adolescents in the US do not regularly protect themselves when outdoors on sunny days.¹³²⁻¹³⁴

In a 2004 national survey of adolescents aged 11 to 18 years,^{128, 135} 39.4% of youth reported using sunscreen always or often during the past summer, and 21.7% protected themselves always or often by seeking the shade; 22.8% used protective clothing (long sleeves or pants) regularly. Use of indoor tanning devices in the past year was reported by 11.1% of adolescents. (Table 3A).

In a 2008 national survey of adults, 32.6% reported always or often using sunscreen when outside for an hour or more on a warm, sunny day in the past 12 months and 31.5% reported seeking shade (Table 3A), while fewer adults reported clothing protection behaviors including using hats (14.3%) or long-sleeved shirts (11.6%). The same survey showed that 15% of adults reported using an indoor tanning device at least once in the past 12 months.

While sunscreen products used appropriately can provide protection from sunburns, skin can still be damaged by prolonged stays in the sun.^{115, 136} In an effort to provide consumers better information on the value and limits of sunscreen use, the Food and Drug Administration (FDA) is in the process of issuing a final monograph that will set standards for formulating, testing, and labeling over-the-counter (OTC) sunscreen drug products with ultraviolet UVA and ultraviolet UVB protection, as both UVA and UVB rays can cause serious serious long-term skin damage and both contribute to skin cancer. For example, one of the proposed changes would modify the meaning of SPF, from sun protection factor to sunburn protection factor, to avoid the impression that high SPF sunscreens offer protection beyond that against sunburns.¹³⁷ It is important that users of sunscreen (particularly those at high risk) learn about proper selection of

Risk Factors and Prevention Measures for Melanoma and Other Skin Cancers

Risk factors for melanoma^{1, 113}

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

Risk factors for basal and squamous cell cancers¹¹³

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

Measures to prevent skin cancer^{130, 131}

- 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 indoor tanning booths and sunlamps, which provide an additional source of non-solar UVR.

sunscreen types and application techniques. Adequate amounts of sunscreen should be applied 30 minutes to one hour prior to outdoor activities and re-applied after sweating, bathing, swimming or accidental wiping away of sunscreen.¹¹⁵ For additional information, go to cancer.org/docroot/SPC/content/SPC_1_Sun_Safety_101.asp

The use of indoor tanning booths or sunlamps is particularly prevalent among young adults and women who perceive a tanned appearance as healthy and attractive.¹¹⁶ In a national sample of adolescents, 17.7% of girls and 5% of boys reported using an indoor tanning booth in the previous year (Table 3A).¹³⁵ At the state level, 21 states have enacted legislation limiting minors' access to indoor tanning facilities, including restricting access to use of tanning facilities by age or requiring parental permission.¹³⁸ Of these states, three (California, New Jersey, and New York) prohibit minors under age 14 from using tanning facilities while Wisconsin prohibits use by minors under age 16. A recent survey of indoor tanning facilities to assess compliance with minors' access laws found that, while many (87%) said they require parental consent before a teen may indoor tan, 71% of establishments would allow a teen to tan more often (every day on the first week of tanning) than the government's recommended limit of three times a week.¹³⁹ Enforcement of and

Table 3A. Ultraviolet Radiation Exposure Behaviors* (%), Adolescents (2004) and Adults (2008)

Adolescents [†]	%*	%*	%*
	Total	Male	Female
Apply sunscreen	39.4	30.0	48.6
Wear a hat	4.9	6.5	3.3
Seek the shade	21.7	20.5	23.0
Wear long-sleeved shirt or pants	22.8	21.9	23.7
Wear sunglasses	32.1	24.4	40.1
Used indoor tanning device [§]	11.1	5.0	17.7

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

*Proportion of respondents reporting always or often practicing the particular sun protection behavior. †2004 prevalence of sun protection practices when outdoors on sunny days in the summer among US adolescents 11 to 18 years. ‡2008 prevalence of sun protection practices on any warm, sunny day among US adults 18 years and older. §Used an indoor tanning booth or sunlamp at least once in the past 12 months. ¶Used an indoor tanning device, including a sunbed, sunlamp, or tanning booth at least once in the past 12 months.

Source: Adolescents: Cokkinides et al.¹²⁸; Cokkinides et al.¹³⁵ Adults: National Health Interview Survey Public Use Data File 2008, National Center for Health Statistics, Centers for Disease Control and Prevention, 2009.

American Cancer Society, Surveillance and Health Policy Research, 2010

compliance of indoor tanning facilities with minors' access laws is low.^{139, 140} Because teenagers have less spending money than adults, a new 10% tax on indoor tanning (to take effect in July 2010) may discourage some young people from being exposed to added cancer risk. Through its authority under the Tanning Accountability and Notification Act, the FDA regulates tanning devices (e.g., booths, sunbeds, or sunlamps) and enforces warning labels on indoor tanning devices to make sure consumers are effectively warned of the known dangers of indoor tanning, including the risk of skin cancer. Parents and adolescents alike need to be educated on the risks of using indoor tanning devices, and the tanning industry needs to be effectively regulated to protect public health.

Sun protection practices among adults and youth have improved little during the past decades despite efforts to educate the public about the harms from excessive sun exposure and the benefits of sun protection.^{128, 134} While education is important, more systematic efforts are needed to affect broader changes in

behavior practices to improve and enable skin cancer preventive practices.^{128, 141, 142} Since children and adolescents are an important target group for skin cancer prevention, the Centers for Disease Control and Prevention (CDC) recommends developing comprehensive programs that include school intervention components, including physical, social, and organizational environments that promote UVR protection, and educating young persons about sun safety.^{131, 141, 143} However, a CDC assessment of School Health Policies and Programs indicated low adoption of sun-safety policies (e.g. scheduling of outdoor activities during the day when the sun is not at peak intensity) in elementary, junior/middle, or senior high schools.¹⁴⁴ Moreover, the extent of adoption of school sun-safety policies may vary by geography and school grade. A 2004 national survey of adolescents aged 11 to 18 found that greater proportions of younger adolescents were aware of sun safety policies in their school, sports program, camp, or swimming pools than older youth (Figure 3A). About 50% reported receiving sun-safety information, 69.7% reported providing shade areas or pavilions to reduce sun exposure, 21.7% reported providing sunscreens, and 20.2% reported sun-safety signs. In states where UVR exposure is high year-round, parents should work with schools to develop sun-protection programs at all grade levels and to establish proper protection practices for their own children. The SunWise School Program, a cost-effective school-based education program established by the Environmental Protection Agency, can provide multiple resources to teach children and their families to protect themselves from overexposure to the sun through the use of classroom-, school-, and community-based components. (More information is available at epa.gov/sunwise/.) Health care professionals including pediatricians can also play an important role in educating their patients and parents about the importance of skin cancer prevention.¹⁴⁵

A review by the Task Force on Community Preventive Services found evidence of effective community programs in two settings: primary schools and recreation/tourism.¹⁴² The interventions evaluated in primary schools had an educational and policy emphasis and showed an increase in children's covering-up behavior specifically, wearing protective clothing and hats. The interventions in recreation/tourism, which showed an increase in adults' covering-up behavior, had multiple strategies including providing educational materials on sun safety by outdoor recreation staff and providing additional shaded areas and/or sunscreen. State and local health departments and voluntary health organizations interested in playing a role in skin cancer prevention can use the Community Guide resources available at cancercontrolplanet.cancer.gov/sun_safety.html.

Early Detection of Skin Cancer

The early signs of skin cancer include changes in the surface of a mole or new appearance of skin growths.¹⁴⁶ Suspicious growths (or lesions) or a progressive change in a lesion's appearance (size, shape, color, etc.) should be evaluated promptly by a physician. Melanomas often start as small, mole-like growths that increase in size and may change color. A simple ABCD rule outlines the warning signals of the most common type of melanoma: A is for asymmetry (one half of the mole does not match the other half); B is for border irregularity (the edges are ragged, notched, or blurred); C is for color (the pigmentation is not uniform, with variable degrees of tan, brown, or black); D is for diameter greater than six millimeters (about the size of a pencil eraser). Other types of melanoma may not have these signs, so be alert for any new or changing skin growths.

The National Cancer Institute developed an interactive tool to help clinicians identify individuals at higher risk of melanoma. (For more information, go to dceg2.cancer.gov/melanomarishtool_prvw/.) Individuals at high risk for skin cancer should undergo periodic screening by a trained provider. Screening examinations consist of a total body skin examination to look for new or changing skin lesions. Education about signs and symptoms and identification of high-risk individuals should occur during a preventive periodic visit or checkup.¹⁴⁶ (For more information about skin cancer prevention and early detection, go to cancer.org/docroot/SPC/content/SPC_1_Sun_Safety_101.asp.)

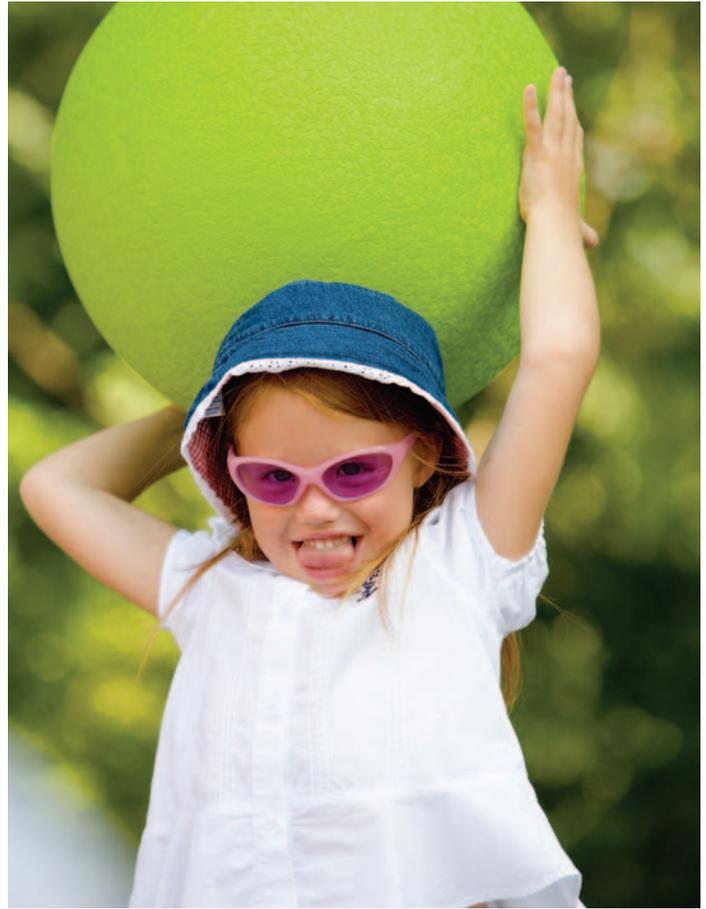
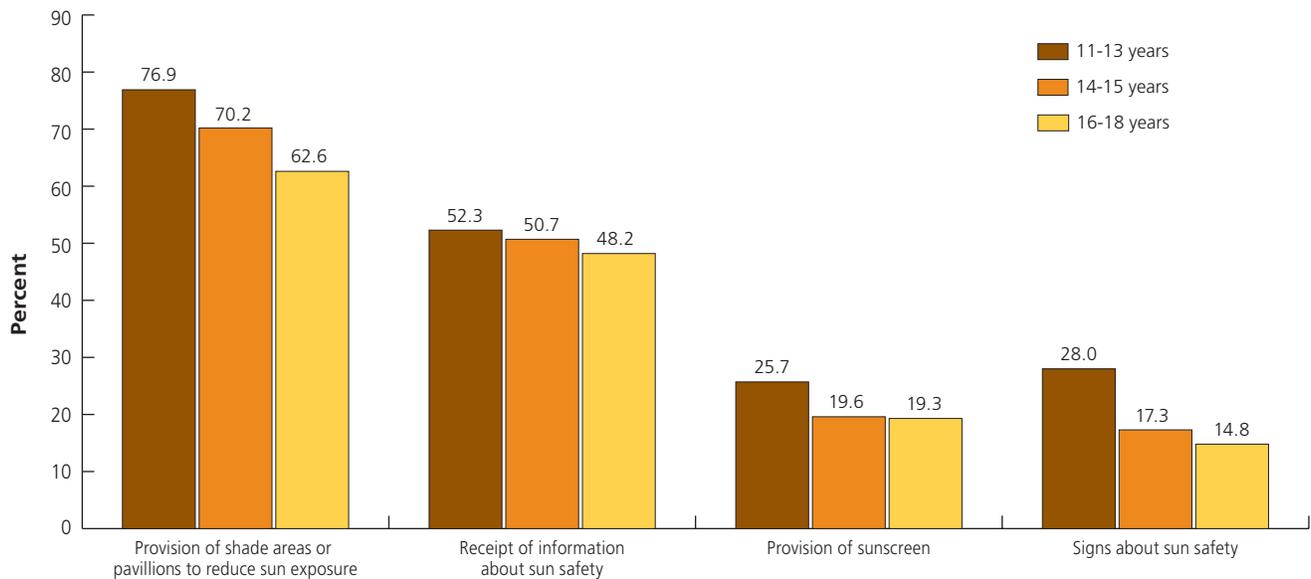


Figure 3A. Sun Safety Promotion in Schools or Sports or Recreational Settings*, by Age Group, US Adolescents, 2004



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

Source: American Cancer Society Sun Survey II, 2004.

American Cancer Society, Surveillance and Health Policy Research, 2010

Cancer Screening

Early detection of cancer through screening has been shown to reduce mortality from cancers of the colon and rectum, breast, and uterine cervix. Screening refers to testing in individuals who are asymptomatic for a particular disease (i.e., they have no symptoms that may indicate the presence of disease). In addition to detecting cancer early, screening for colorectal or cervical cancers can identify and result in the removal of precancerous abnormalities, preventing cancer altogether.¹⁴⁶ Following the recommendations for cancer screening from the American Cancer Society is an important complement to healthy behaviors that reduce the risk of both developing and dying from cancer.

The American Cancer Society screening guidelines for average-risk individuals recommend that all adults age 50 years and older be screened periodically for colorectal cancer, and that women of designated ages be screened regularly for breast and cervical cancer. At present, there is insufficient evidence to recommend for or against prostate cancer screening. The American Cancer Society recommends that asymptomatic men who have at least a 10-year life expectancy have an opportunity to make an informed decision with their health care provider about whether to be screened for prostate cancer, after receiving information about the uncertainties, risks, and potential benefits associated with prostate cancer screening.¹⁸⁷ The American Cancer Society screening guidelines for the early detection of cancer are shown on page 33.

Although cancer screening is primarily a form of secondary prevention, access to and utilization of cancer screening tests is part of the Society's cancer control prevention efforts to help people stay well. Thus, the Society and many other health care policy advocates consider health care reform a necessary step to revitalize a currently fragmented health care system that leaves many uninsured or underinsured; the 46 million individuals in the US who lack health insurance experience barriers to appropriate health care services. Achieving the American Cancer Society's mission to save lives requires improving access to quality, affordable health care. In March 2010, Congress passed and the president signed comprehensive health care reform legislation. While not a cure-all, health care reform legislation is a critical component for improving access to care. The American Cancer Society Cancer Action Network (ACS CAN) has worked diligently with multiple partners in advocating for comprehensive health reform legislation to improve access to timely, effective, and high-quality prevention, detection, and cancer treatment services. In addition, the American Cancer Society works through multiple avenues (government, medical groups, and communities) to save lives from cancer by helping people stay well and get well, by finding cures, and by fighting back.

This is an important part of the effort to meet the Society's 2015 challenge goals of reducing cancer incidence and mortality.

Breast Cancer Screening

Breast cancer screening has been shown to reduce breast cancer mortality.¹⁴⁶ In the US, death rates from breast cancer in women have been declining since 1990, due in part to early detection by mammography screening and improvements in treatment.¹ Currently, 60% of breast cancers are diagnosed at a localized stage, for which the five-year survival rate is 98%.¹⁴⁹ Further reductions in breast cancer death rates are possible by improving regular use of mammography screening and providing timely access to high-quality follow-up and treatment. The American Cancer Society played a key role in the early research to demonstrate the feasibility of mass screening for breast cancer, collaborating with the National Cancer Institute on the nationwide Breast Cancer Detection Demonstration Project. The Society also provided support to the American College of Radiology to initiate the organization's Mammography Accreditation Program to improve the quality of mammography.

Despite the relatively high prevalence of mammography screening in the US (within the past 2 years: 67.1% in 2008, Table 4A), studies suggest that many women are initiating mammography later than recommended, not having mammography at recommended intervals, or not receiving appropriate and timely follow-up of positive screening results.¹⁵⁰⁻¹⁵² These indicators of inadequate screening are associated with more advanced tumor size and stage at diagnosis. The American Cancer Society screening guidelines recommend that average-risk women aged 40 and older receive mammography screening on an annual basis. There is no specific upper age at which mammography screening should be discontinued. Rather, the decision to stop regular mammography screening should be made on an individual basis based on the potential benefits and risks of screening within the context of a patient's overall health status and estimated longevity. Also, women should be informed of the scientific evidence demonstrating the value of detecting breast cancer before symptoms develop and the importance of adhering to a schedule of regular mammograms as well as of the potential downsides associated with mammographic screening, including false-positive results and the possibility of undergoing a biopsy for abnormalities that prove to be benign.¹⁴⁶ It is the position of the American Cancer Society that the balance of benefits to possible harms strongly supports the value of breast cancer screening.

For women at high risk for breast cancer, the Society recommends annual screening using magnetic resonance imaging (MRI) in addition to mammograms beginning at age 30; the high-risk status of these women (lifetime risk approximately 20%-25% or greater) is based on the presence of mutations in the breast cancer susceptibility genes, BRCA1 and BRCA2; strong

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

Cancer Site	Population	Test or Procedure	Frequency
Breast	Women, age 20+	Breast self-examination	Beginning in their early 20s, women should be told about the benefits and limitations of breast self-examination (BSE). The importance of prompt reporting of any new breast symptoms to a health professional should be emphasized. Women who choose to do BSE should receive instruction and have their technique reviewed on the occasion of a periodic health examination. It is acceptable for women to choose not to do BSE or to do BSE irregularly.
		Clinical breast examination	For women in their 20s and 30s, it is recommended that clinical breast examination (CBE) be part of a periodic health examination, preferably at least every three years. Asymptomatic women aged 40 and over should continue to receive a clinical breast examination as part of a periodic health examination, preferably annually.
		Mammography	Begin annual mammography at age 40.*
Colorectal†	Men and women, age 50+	Tests that find polyps and cancer: Flexible sigmoidoscopy, [§] or	Every five years, starting at age 50
		Colonoscopy, or	Every 10 years, starting at age 50
		Double-contrast barium enema (DCBE), [§] or	Every five years, starting at age 50
		CT colonography (virtual colonoscopy) [§]	Every five years, starting at age 50
		Tests that mainly find cancer: Fecal occult blood test (FOBT) with at least 50% test sensitivity for cancer, or fecal immunochemical test (FIT) with at least 50% test sensitivity for cancer ^{§, ‡} or	Annual, starting at age 50
Stool DNA test (sDNA) [§]	Interval uncertain, starting at age 50		
Prostate	Men, age 50+	Prostate-specific antigen test (PSA) with or without digital rectal exam (DRE).	Asymptomatic men who have at least a 10-year life expectancy should have an opportunity to make an informed decision with their health care provider about screening for prostate cancer after receiving information about the uncertainties, risks, and potential benefits associated with screening. Men at average risk should receive this information beginning at age 50. Men at higher risk, including African American men and men with a first degree relative (father or brother) diagnosed with prostate cancer before age 65, should receive this information beginning at age 45. Men at appreciably higher risk (multiple family members diagnosed with prostate cancer before age 65) should receive this information beginning at age 40.
Cervix	Women, age 18+	Pap test	Cervical cancer screening should begin approximately three years after a woman begins having vaginal intercourse, but no later than 21 years of age. Screening should be done every year with conventional Pap tests or every two years using liquid-based Pap tests. At or after age 30, women who have had three normal test results in a row may get screened every two to three years with cervical cytology (either conventional or liquid-based Pap test) alone, or every three years with an HPV DNA test plus cervical cytology. Women 70 years of age and older who have had three or more normal Pap tests and no abnormal Pap tests in the past 10 years and women who have had a total hysterectomy may choose to stop cervical cancer screening.
Endometrial	Women, at menopause	At the time of menopause, women at average risk should be informed about risks and symptoms of endometrial cancer and strongly encouraged to report any unexpected bleeding or spotting to their physicians.	
Cancer-related checkup	Men and women, age 20+	On the occasion of a periodic health examination, the cancer-related checkup should include examination for cancers of the thyroid, testicles, ovaries, lymph nodes, oral cavity, and skin, as well as health counseling about tobacco, sun exposure, diet and nutrition, risk factors, sexual practices, and environmental and occupational exposures.	

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

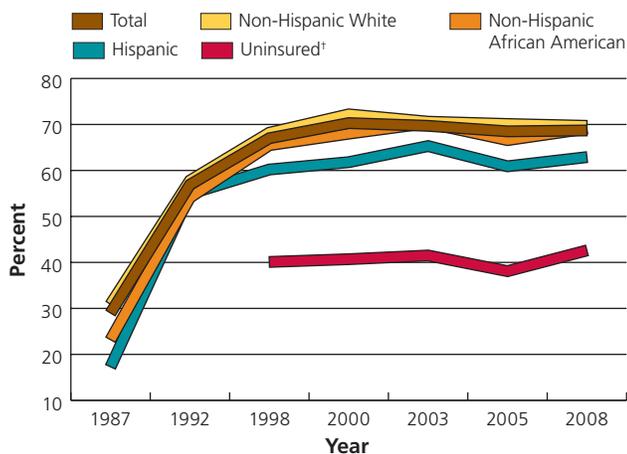
† Individuals with a personal or family history of colorectal cancer or adenomas, inflammatory bowel disease, or high-risk genetic syndromes should continue to follow the most recent recommendations for individuals at increased or high risk.

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

§ Colonoscopy should be done if test results are positive.

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

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



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

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

American Cancer Society, Surveillance and Health Policy Research, 2010

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

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

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

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

American Cancer Society, Surveillance and Health Policy Research, 2010

family history of breast and/or ovarian cancer; or prior chest radiation therapy (e.g., for Hodgkin disease).¹⁴⁸

Recent progress in breast cancer research has led to the development of chemo-preventive options for women who are at high risk for breast cancer. Currently, there are two drugs – tamoxifen and raloxifene – that have been approved by the Food and Drug Administration (FDA) for high-risk women to reduce the risk of breast cancer. Since these drugs have side effects, it is important that women who are considering taking tamoxifen or raloxifene discuss the risks and benefits with their medical providers.^{154, 155}

Mammography Screening in the US

National breast cancer screening data are available from the National Health Interview Survey (NHIS) that measure screening within the past year and past two years. The NHIS has tracked trends in mammography since 1987.¹⁵⁶

- The percentage of women aged 40 years and older who reported having a mammogram within the past two years increased from 29% in 1987 to 70% in 2000; thereafter, it has remained relatively stable (67.1% in 2008). Also, while mammography rates improved in all race and ethnicity groups during this period, they remained persistently low in uninsured women (Figure 4A).

- Both white and African American women aged 40 and older reported similar prevalence of having a mammogram in the past two years (about 68%); however, in women of other racial/ethnic groups the prevalence of mammography screening is lower: 55.3% in American Indian/Alaska Native women, 61.5% in Hispanic women, and 65.1% in Asian women (Table 4A, Figure 4A).
- The lowest prevalence of mammography use in the past two years occurred among women who lack health insurance (35.6%), followed by immigrant women who have lived in the US for fewer than 10 years (49.7%) (Table 4A).
- Only 53% of women aged 40 and older reported having a mammogram within the past year (Table 4A). The American Cancer Society recommends annual mammograms for women starting at age 40.

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

	% Recent Mammogram*					% Recent Mammogram and Clinical Breast Exam†				
	40 years and older	40 to 64 years	65 years and older	No usual source of medical care‡	No health insurance§	40 years and older	40 to 64 years	65 years and older	No usual source of medical care‡	No health insurance§
Alabama	57.5	56.0	60.6	29.2	28.1	48.3	49.6	45.5	25.1	22.0
Alaska	54.2	53.2	58.3	30.2	31.8	47.2	46.9	48.6	26.0	29.9
Arizona	61.2	57.1	69.3	37.3	36.0	53.2	51.6	56.3	33.4	33.5
Arkansas	56.3	53.6	61.8	28.2	25.9	48.3	48.5	47.8	25.2	23.5
California	63.9	62.7	67.1	44.2	43.3	53.9	54.4	52.5	36.0	37.3
Colorado	57.6	55.8	63.1	24.9	29.1	50.4	50.4	50.5	18.4	25.0
Connecticut	70.9	71.6	69.3	41.0	43.7	62.7	66.3	54.3	30.9	35.9
Delaware	69.8	69.9	69.4	44.9	42.7	61.1	64.0	54.5	38.2	37.3
District of Columbia	62.9	60.5	68.0	34.4	35.8	56.5	55.2	59.3	30.7	31.5
Florida	65.6	62.8	70.8	41.4	38.4	56.2	56.5	55.7	33.6	32.0
Georgia	65.5	65.0	66.8	39.8	34.4	57.9	59.7	52.9	36.7	31.8
Hawaii	63.5	63.3	64.0	39.4	29.1	51.7	53.8	47.5	32.2	26.1
Idaho	53.9	51.9	59.0	27.6	29.0	48.3	47.8	49.7	23.8	26.5
Illinois	60.2	59.4	61.9	32.0	42.3	51.5	52.7	48.7	26.8	38.7
Indiana	58.1	56.6	61.5	26.6	29.2	49.2	50.5	46.1	22.9	24.5
Iowa	62.9	61.1	66.2	28.6	29.4	55.1	55.9	53.5	24.5	26.9
Kansas	61.6	59.9	65.3	29.9	26.1	53.3	54.5	50.5	26.2	21.6
Kentucky	59.3	58.5	61.3	31.2	39.3	50.4	51.8	47.3	25.2	32.1
Louisiana	64.3	63.1	67.1	37.9	45.9	55.0	55.6	53.4	32.8	39.2
Maine	69.9	67.7	74.7	32.5	34.3	61.8	62.2	61.1	28.3	32.3
Maryland	61.8	60.2	65.9	24.2	27.2	53.4	53.1	54.1	18.7	22.3
Massachusetts	72.8	72.5	73.5	48.2	58.6	64.7	66.2	61.2	40.7	51.2
Michigan	63.6	62.2	66.9	26.0	37.9	56.9	57.3	55.8	20.7	31.8
Minnesota	62.0	61.5	63.3	30.9	27.5	56.6	57.0	55.5	25.9	24.7
Mississippi	55.2	54.2	57.5	29.1	29.0	47.4	48.2	45.5	22.6	22.9
Missouri	56.7	54.6	61.2	25.8	24.6	48.3	48.6	47.5	24.3	21.0
Montana	56.6	54.8	60.4	34.5	29.9	50.4	50.8	49.3	28.8	25.0
Nebraska	57.7	57.7	57.8	28.2	29.9	50.3	52.3	46.1	20.9	27.3
Nevada	54.5	53.4	57.3	21.9	26.5	44.1	45.4	41.0	18.2	19.6
New Hampshire	67.9	67.1	69.9	31.2	38.2	60.7	62.2	57.0	26.6	34.3
New Jersey	62.7	63.0	62.1	37.1	38.0	55.0	58.0	47.9	32.3	32.7
New Mexico	54.4	52.9	57.9	27.6	26.2	47.4	47.2	47.7	25.1	24.2
New York	65.4	64.3	67.8	37.8	42.8	58.1	58.6	57.0	27.3	32.3
North Carolina	64.4	62.7	68.2	36.9	36.3	56.5	56.9	55.4	32.5	32.1
North Dakota	63.6	60.8	69.0	35.9	39.4	56.6	56.4	57.0	28.1	34.3
Ohio	61.2	60.2	63.3	30.2	28.8	52.3	54.5	47.6	28.0	25.5
Oklahoma	50.9	49.5	53.8	23.3	22.5	42.0	42.9	40.0	18.8	19.2
Oregon	61.7	60.2	65.0	26.7	26.2	51.6	51.7	51.4	21.7	19.8
Pennsylvania	62.8	62.7	63.0	32.5	38.2	54.0	56.4	49.3	22.9	30.3
Rhode Island	69.2	69.0	69.6	44.2	51.3	62.0	63.5	58.8	33.2	41.2
South Carolina	58.9	56.7	63.6	21.3	31.2	49.7	49.6	50.0	16.3	23.1
South Dakota	63.4	60.7	68.7	30.3	30.3	54.8	54.8	54.8	25.1	25.2
Tennessee	58.0	56.4	61.8	36.8	33.1	51.1	51.6	49.6	32.9	29.7
Texas	57.8	56.4	61.6	34.3	38.9	50.4	50.6	49.8	28.6	33.0
Utah	49.9	48.7	53.1	30.7	25.2	40.8	40.5	41.7	24.5	17.4
Vermont	67.6	67.2	68.7	27.6	47.7	59.0	60.3	55.8	26.2	41.7
Virginia	64.2	63.0	67.3	36.9	37.1	56.7	57.3	55.1	33.2	34.8
Washington	60.5	58.4	66.1	29.7	32.6	51.3	51.5	50.7	25.4	28.7
West Virginia	60.4	59.4	62.3	31.5	35.3	52.0	53.8	48.4	28.0	33.4
Wisconsin	62.9	61.0	67.4	22.8	34.5	57.1	56.8	57.9	16.2	32.1
Wyoming	52.0	51.1	54.1	29.1	23.0	43.9	45.3	40.3	23.3	21.2
United States¶	62.1	60.7	65.1	35.0	36.4	53.8	54.5	51.9	29.2	31.1
Range	49.9-72.8	48.7-72.5	53.1-74.7	21.3-48.2	22.5-58.6	40.8-64.7	40.5-66.3	40-61.2	16.2-40.7	17.4-51.2

*A mammogram within the past year. †Both a mammogram and clinical breast exam within the past year. ‡Women 40 and older who reported that they did not have a personal doctor or health care provider. §Women aged 40 to 64 who reported that they did not have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare. ¶See Statistical Notes for definition.

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

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State-level Mammography Screening

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

- In 2008, the percentage of women aged 40 and older who reported having a mammogram in the past year ranged from 49.9% in Utah to 72.8% in Massachusetts (Table 4B).
- Utah is the only state that does not have legislation to improve private insurance coverage for mammography screening; Utah has the lowest prevalence of mammography screening.¹⁵⁷
- Screening participation rates are approximately 7% to 9% points lower when measuring the percentage of women who had a mammogram *and* clinical breast exam, ranging from 40.8% in Utah to 64.7% in Massachusetts.
- Having a usual source of care is an indicator of access to preventive health care services and is related in part to health care coverage. In almost all states, women who lack a usual source of care or are uninsured have a much lower prevalence of breast cancer screening than the general population (Table 4B).

There is a need for continued efforts to increase mammography utilization. For the most recent time period, between 2005 and 2008, the US trend in mammography utilization has remained stable (Figure 4A).¹⁵⁸ In order to further reduce breast cancer mortality, it is important to improve access to screening; rates of mammography use continue to be low among those with low income levels, recent immigrants, and individuals who lack health insurance coverage.^{158, 159} Access barriers to screening may lead to more advanced stage breast cancer diagnosis and poorer survival.^{151, 160} Programs and policies that both promote and enable access to mammography screening for low-income uninsured and underinsured women need to be enhanced and supported.¹⁶¹

Cervical Cancer Screening

Cervical cancer incidence and mortality rates have decreased 67% over the past three decades, with most of the reduction attributed to the Pap test, which detects cervical cancer and precancerous lesions.¹⁶² Between 60% and 80% of women with advanced cervical cancer have not had a Pap test in the past five years.¹⁶³ For women in whom precancerous lesions have been detected through Pap tests, the likelihood of survival is nearly 100% with appropriate evaluation, treatment, and follow-up.¹⁶³ Historically, the American Cancer Society played a critical role in developing and promoting the use of the Pap test. Cervical cancer is now one of the most successfully controlled cancers, particularly in developed countries.¹⁶² With the approved vaccine for immunization against the human papillomavirus (HPV) in young girls, there is a great potential for further reducing the occurrence of cervical cancer in the US. In developing countries, where the burden of cervical cancer is high, the control of cervical cancer through screening and prevention via HPV vaccines



is an important priority. At present, most developing countries have limited capacity for cervical cancer screening, and the cost of the HPV vaccine is a significant barrier for implementing vaccine programs.¹⁶⁴

HPV Vaccine and Cervical Cancer (and Vulvar Cancer) Prevention

HPV is the most common sexually transmitted infection in the US, with approximately 6.2 million people becoming newly infected annually.^{165, 166} There are more than 100 types of HPV, and more than 40 of these types can infect the genitals. Although most HPV infections are benign and transient, virtually all cervical cancers are causally related to infections by HPV. Approximately 70% of cervical cancers are caused by HPV types 16 or 18.¹⁶² Vaccines have been developed against HPV-16 and HPV-18 and other subtypes. Recent clinical trials show that the vaccines are effective in preventing persistent new infections and reducing rates of precursor lesions (adenoma in situ or intraepithelial neoplasia) in the cervix.^{167, 168, 169} Made from non-infectious HPV-like particles, these vaccines offer a promising new approach to the prevention of cervical cancer, as well as other HPV-associated conditions (e.g., vulvar cancer and genital warts).¹⁶⁶

In June 2006, a vaccine (Gardasil) that protects against four types of HPV, including types 16 and 18, was approved by the FDA for use in females aged 9 to 26. In October 2009, the FDA approved a second HPV vaccine (Cervarix) and expanded the approval of Gardasil for use in boys and young men to prevent genital warts. Males can carry HPV and transmit it to their partners. HPV can cause genital warts and penile and anal cancer in men.¹⁷⁰ The Advisory Committee on Immunization Practices (ACIP), the federal entity charged with making recommendations for the administration of vaccines to the pediatric and adult populations, voted against routine vaccination of males in favor of “permissive,” or optional, vaccination in males aged 9 to 26. At present, the American Cancer Society has no recommendation regarding the use of HPV vaccine in males.

Summary of American Cancer Society Recommendations for HPV Vaccine Use to Prevent Cervical Cancer and Its Precursors¹⁷³

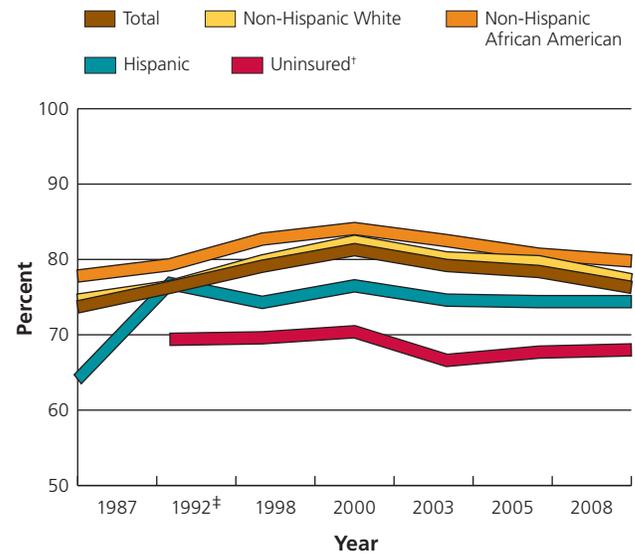
- Routine HPV vaccination is recommended for females aged 11 to 12.
- Females as young as age 9 may receive HPV vaccination.
- The HPV vaccination is also recommended for females aged 13 to 18 to catch up on missed vaccine or complete the vaccination series.
- There are currently insufficient data* to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

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

To be most effective, the HPV vaccine should be given before a person becomes sexually active, and in three doses within one year. The ACIP recommended that the vaccine be routinely given to females aged 11 to 12 years and as early as age 9 years at the discretion of doctors. The committee also recommended females aged 13 to 26 who have not yet been vaccinated receive “catch-up” vaccinations.^{165, 171} Based on ongoing assessments of vaccine safety information,¹⁷² the FDA and Centers for Disease Control and Prevention (CDC) continue to find that Gardasil is safe and its side effects, which include pain or tenderness at the injection site, are mild.¹⁶⁵ In January 2007, the Society published its own recommendations for HPV vaccine use.¹⁷³ (See sidebar, above.) These guidelines are generally consistent with those of the ACIP.

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

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



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

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

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most have agreed to cover the HPV vaccine.¹⁶⁶ However, affordability concerns may be an issue among private health care providers because some have experienced financial barriers to purchasing the HPV vaccine.¹⁷⁴

The CDC has announced that the HPV vaccine is available in all 50 states through the federal Vaccine for Children (VFC) program, which covers vaccine costs for children and teens who do not have insurance and for some children and teens who are underinsured or eligible for Medicaid.¹⁶⁶ The CDC has implemented the Pre-teen Vaccine Campaign to inform parents, caregivers, family physicians, and pediatricians about the new vaccination recommendations (including HPV vaccine for girls) for 11- and 12-year-olds. Research shows that pre-teens generally do not get preventive health care and visit the doctor only when they are sick. One goal of this campaign is to encourage parents to take their pre-teens in for the recommended 11- or 12-year-old checkup, which is endorsed by the American Academy for Pediatrics and the American Academy of Family Physicians, as well as the CDC.¹⁶⁵ Recent data from the National Immunization

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

Characteristic	% Pap test within past 3 years [†]
Age (years)	
18 to 20	57.6
21 to 29	84.7
30 to 39	85.9
40 to 49	84.1
50 to 59	84.5
60 to 64	81.4
65 to 85	56.3
Race/ethnicity	
Hispanic/Latino	75.0
White (non-Hispanic)	79.6
African American (non-Hispanic)	81.5
American Indian/Alaska Native [‡] (non-Hispanic)	65.2
Asian American [§] (non-Hispanic)	63.8
Education (years)[¶]	
11 or fewer	68.3
12	73.7
13-15	81.1
16 or more	84.8
Health insurance coverage	
No	60.6
Yes	81.0
Immigration[#]	
Born in US	79.7
Born in US territory	70.2
In US fewer than 10 yrs	60.1
In US 10+ years	74.3
Total	78.3

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

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

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Survey of Teens showed that among US girls aged 13 to 17, the uptake of the HPV vaccine initiation (reporting to have one of the three shots HPV vaccination series) increased from 25.1% in 2007 to 37.2% in 2008. Fewer than one in four (17.9%) girls had the whole three-shot vaccine series in 2008.¹⁷⁵

The HPV vaccine will only supplement rather than replace cervical cancer screening, since the vaccine will not provide protection against all types of HPV that cause cervical cancer. Also, women may not receive the full benefits of the vaccine if they do not complete the vaccine series, or if they receive the vaccine after becoming infected with one or more types of HPV.

Thus, women of all ages should continue to receive regular cervical cancer screening.¹⁷³

The promise of cancer prevention vaccines from a broad public health perspective can be fully realized only if the vaccine reaches those subgroups of women for whom access to cervical cancer screening services is especially challenging, particularly immigrants, those living in rural areas, low-income and uninsured females, and others who have limited access to health care services.¹⁷³ Hence, the Society supports and advocates for the widespread availability and use of the vaccine consistent with published guidelines.¹⁷⁶ Legislators in at least 41 states and the District of Columbia have introduced legislation to require, fund, or educate the public about the HPV vaccine and to date 17 states have enacted such legislation. (For more details, refer to the National Conference of State Legislatures' HPV vaccine legislation tracking resource.¹⁷⁷)

Pap Test Screening in the US

- According to data from the NHIS,¹⁵⁶ 78.3% of women aged 18 and older reported in 2008 having a Pap test within the past three years, up from 74% in 1987. Increases in Pap test use have occurred among women of all racial and ethnic groups (Figure 4B) except in uninsured women.
- In 2008, the prevalence of Pap test use varied by race and ethnicity: African American (81.5%) and white women (79.6%) were most likely to have had a recent test, and Asian women (63.8%) were least likely (Table 4C).
- In 2008, the prevalence of recent Pap test use was lowest among older women (56.3%), women with no health insurance (60.6%), and recent immigrants (60.1%) (Table 4C).

State-level Pap Test Screening

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

Programs to Increase the Rate of Breast and Cervical Cancer Screening

The CDC's National Breast and Cervical Cancer Early Detection Program (NBCCEDP) provides low-income, uninsured women with access to timely, high-quality screening exams for the early detection of breast and cervical cancers and diagnostic services.¹⁷⁸ The program is currently implemented in all 50 states, the District of Columbia, five US territories, and 12 American Indian/Alaska Native organizations. About 50% of the women screened have been from racial/ethnic minority groups. Since 1991, the NBCCEDP has served more than 3.3 million women, provided more than eight million screening examinations, and diagnosed more than 37,000 breast cancers, 121,000 precancerous cervical lesions, and 2,324 cases of invasive cervical cancer.¹⁷⁸

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

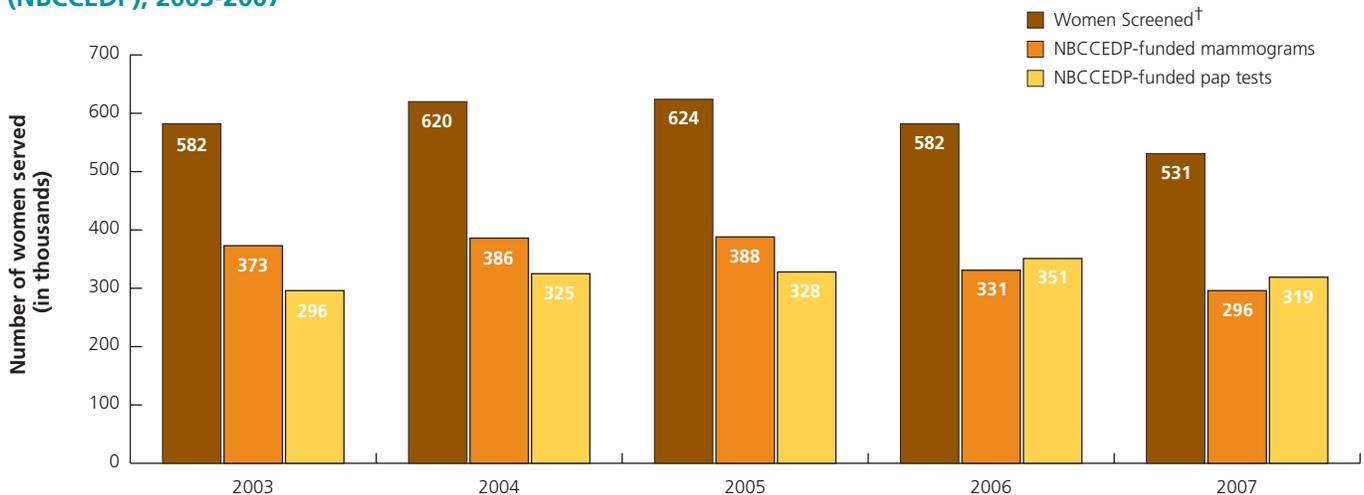
	% Recent Pap Test*				
	18 years and older	18 to 64 years	65 years and older	No usual source of medical care [†]	No health insurance [‡]
Alabama	80.9	83.2	63.9	65.4	68.0
Alaska	82.5	84.4	56.0	75.0	71.6
Arizona	81.7	82.4	76.7	70.9	67.3
Arkansas	80.4	83.6	59.7	72.3	73.7
California	83.8	85.5	70.0	73.3	75.5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

*A Pap test within the preceding three years for women with intact uteri. †Women 18 and older who reported that they did not have a personal doctor or health care provider. ‡Women aged 18 to 64 who reported that they did not have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare. §Sample size is insufficient to provide a stable estimate or relevant questions not available in state survey. ¶See Statistical Notes for definition.

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

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Figure 4C. Number of Women Screened in the National Breast and Cervical Cancer Early Detection Program (NBCCEDP), 2003-2007*



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

Source: National Breast and Cervical Cancer Early Detection Program, Centers for Disease Control and Prevention, 2009.

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In addition to locating women eligible to receive services, state programs funded by NBCCEDP conduct outreach to priority populations (i.e., older women for breast cancer screening, women rarely or never screened for cervical cancer, and racial and ethnic minority women). Reaching priority populations can be difficult and costly and requires ongoing efforts with community partners and health care providers.¹⁷⁸ In contrast to an early period of the program's growth between 1991 to 2006, in 2007, the number of eligible women served by the NBCCEDP was lower than in previous years (Figure 4C). Studies estimate that the program has been reaching approximately 15% of the estimated four million US women aged 40 to 64 who are low-income uninsured and/or are underinsured.¹⁶¹ The total funding available for the NBCCEDP program has remained flat since fiscal year 2005 at \$205 million (despite an authorization level of \$250 million). In recognition of the limited program resources, the CDC is assisting state programs in finding way to enhance program efficiencies through economic evaluation studies.¹⁷⁹ The Society and ACS CAN continue to advocate for additional NBCCEDP funding from Congress and are also partnering with state health departments and other key organizations to implement best practices in communities that could strengthen the NBCCEDP.

The 2000 Breast and Cervical Cancer Prevention and Treatment Act has given states the option to provide medical assistance through Medicaid for follow-up and treatment for women diagnosed with cancer through the NBCCEDP; all 50 states and the District of Columbia have elected to provide this coverage.¹⁷⁸

Currently, the Society and ACS CAN are working to ensure that state Medicaid dollars supporting the treatment program are protected. In addition, ACS CAN is working hard to ensure that every woman has access to proven screening exams that can detect cancer early by ensuring prevention is part of health care reform.

Colorectal Cancer Screening

Colorectal cancer is the third leading cause of cancer death in the US in men and women. Promoting colorectal cancer screening is a major priority for the American Cancer Society because screening can reduce death rates from colorectal cancer both by preventing the disease and by detecting it at earlier, more treatable stages. The relative five-year survival is 91% for colorectal cancer patients diagnosed at an early, localized stage; however, only 39% of cases are diagnosed at this stage.¹ Colorectal cancer is one of the few cancers that can also be prevented through screening because precancerous polyps, from which these cancers usually develop, can be identified and removed.^{180, 181} Of the 51,370 people expected to die of colorectal cancers in 2010, early detection could save more than half.¹⁸² In the past several years, there has been unprecedented progress in reducing colorectal cancer (CRC) incidence and death rates; recent studies have shown that declines in CRC can be attributed to improved CRC screening utilization, risk factor reductions (e.g., declining tobacco use), and improved treatments.¹⁸³

The American Cancer Society and other organizations have developed and promoted colorectal cancer screening guidelines for more than two decades. In March 2008, the Society, the American College of Radiology, and the US Multisociety Task Force on Colorectal Cancer (a consortium representing the American College of Gastroenterology, the American Society of Gastrointestinal Endoscopy, and the American Gastroenterological Association) released updated CRC guidelines. The new guidelines categorize screening methods into two distinct groups: tests that primarily detect cancer and tests that detect both cancer and precancerous adenomatous polyps (and thus have a greater potential to contribute to cancer prevention). The new guidelines also highlight the potential of some newer screening methods, as well as the importance of quality in colorectal cancer screening by delineating a number of quality factors required to attain optimal benefits from screening. There are several recommended methods for colorectal cancer screening. (For American Cancer Society screening guidelines, see page 33.) Methods in the cancer detection group consist of stool home-test kits – the guaiac-based fecal occult blood test (gFOBT) and the fecal immunochemical test (FIT) – and the stool DNA test. The methods for structural examinations include flexible sigmoidoscopy, colonoscopy, CT colonography, and double-contrast barium enema. These tests not only find cancer, but also are more likely to result in the detection and removal of adenomatous polyps/lesions, which are associated with an increased risk of colorectal cancer.¹⁸⁰

Colorectal Cancer Screening in the US

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

According to the 2008 NHIS:

- Among adults aged 50 and older, the use of any colorectal cancer (CRC) test within recommended time intervals (either an FOBT within the past year or a sigmoidoscopy within the past five years or a colonoscopy within the past 10 years) increased between 2000 (38%) and 2008 (53.2%). The increase appears to be due to an increase in use of endoscopy, which increased from 34% in 2000 to 50% in 2008, compared to use of FOBT, which declined from 17% in 2000 to 10% in 2008.¹⁸⁴ However, FOBT remains an important screening option (Table 4E).
- People with no health insurance coverage have significant access barriers and are less likely to be up-to-date with CRC screening compared to their insured counterparts. Between 2000 and 2008, there were significant increases in the use of CRC screening within recommended time intervals across race and ethnic groups of insured adults (aged 50 to 64). The largest increases in CRC screening utilization occurred among insured non-Hispanic whites (Figure 4D).

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

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

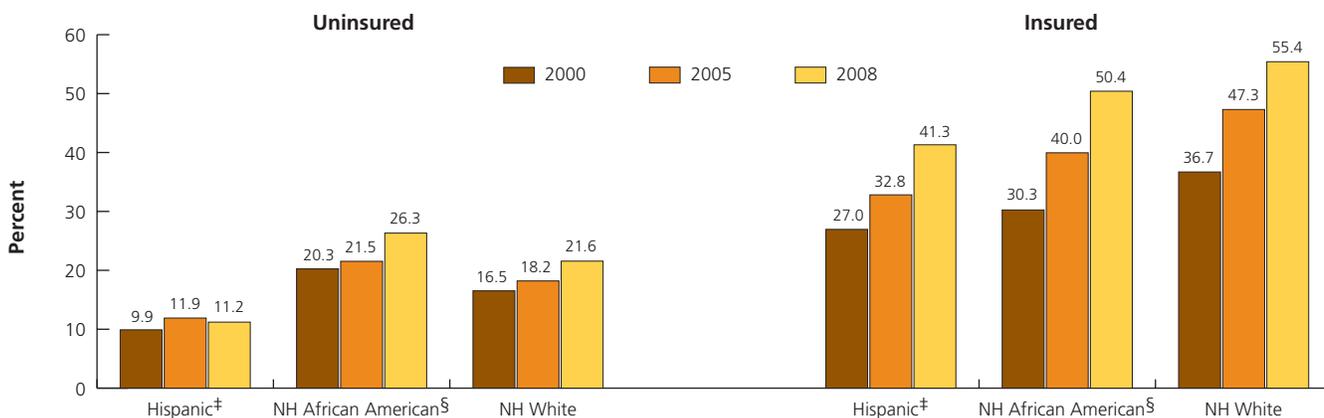
*A home fecal occult blood test within the past year. †A sigmoidoscopy within the past five years or a colonoscopy within the past 10 years. ‡Either a fecal occult blood test within the past year, sigmoidoscopy within the past five years, or a colonoscopy within the past 10 years. §Percentages are age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

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

American Cancer Society, Surveillance and Health Policy Research, 2010

- In 2008, the prevalence of colorectal cancer screening varied by race, education, health insurance coverage, and immigration status; those without health insurance, those with less than a high school education, Hispanics, and immigrants who had been in the US for fewer than 10 years were the least likely to have had a colorectal cancer screening test (Table 4E).

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



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

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

American Cancer Society, Surveillance and Health Policy Research, 2010

State-level Colorectal Cancer Screening

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

The recent increases in colorectal cancer screening may be attributed to multiple efforts to increase awareness of the importance of colorectal cancer screening, expansions in coverage for colonoscopy screening by Medicare since 2001, changes in private health plans screening policies as a result of state legislation, increasing proportions of providers recommending screening, and the establishment of screening programs in certain states.¹⁸⁴⁻¹⁸⁶ However, broader community efforts need to be intensified to increase availability and utilization of CRC screening, especially for persons with lower socioeconomic status who are more likely to lack health care coverage and experience greater difficulties in accessing health care.^{184, 185}

How the Society Promotes Screening for Colorectal Cancer

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

Colorectal Cancer Early Detection, Prevention and Treatment Act (H.R. 1189) could have a direct impact on reducing colon cancer deaths by screening more Americans for colorectal cancer and providing them with the necessary treatment.

The CDC recently announced grant awards (totaling \$22 million) to 26 states and tribal organizations. The program aims to increase population-level colorectal cancer screening among all persons aged 50 and older in the participating states and tribes and to reduce health disparities in colorectal cancer screening, incidence, and mortality by providing colorectal cancer screening services for low-income people aged 50 to 64, who are underinsured or uninsured. This new program effort builds on the previous CDC's Colorectal Cancer Screening Demonstration Program, funded from 2005-2009; for more information, see cdc.gov/colorectal and cdc.gov/screenforlife.

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

The Society is also collaborating with the Centers for Medicare & Medicaid Services (CMS) to help CMS increase colorectal cancer screening use among the 44 million Medicare beneficiaries. CMS has leveraged resources across the agency to promote a wide range of interventions, including communicating with

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

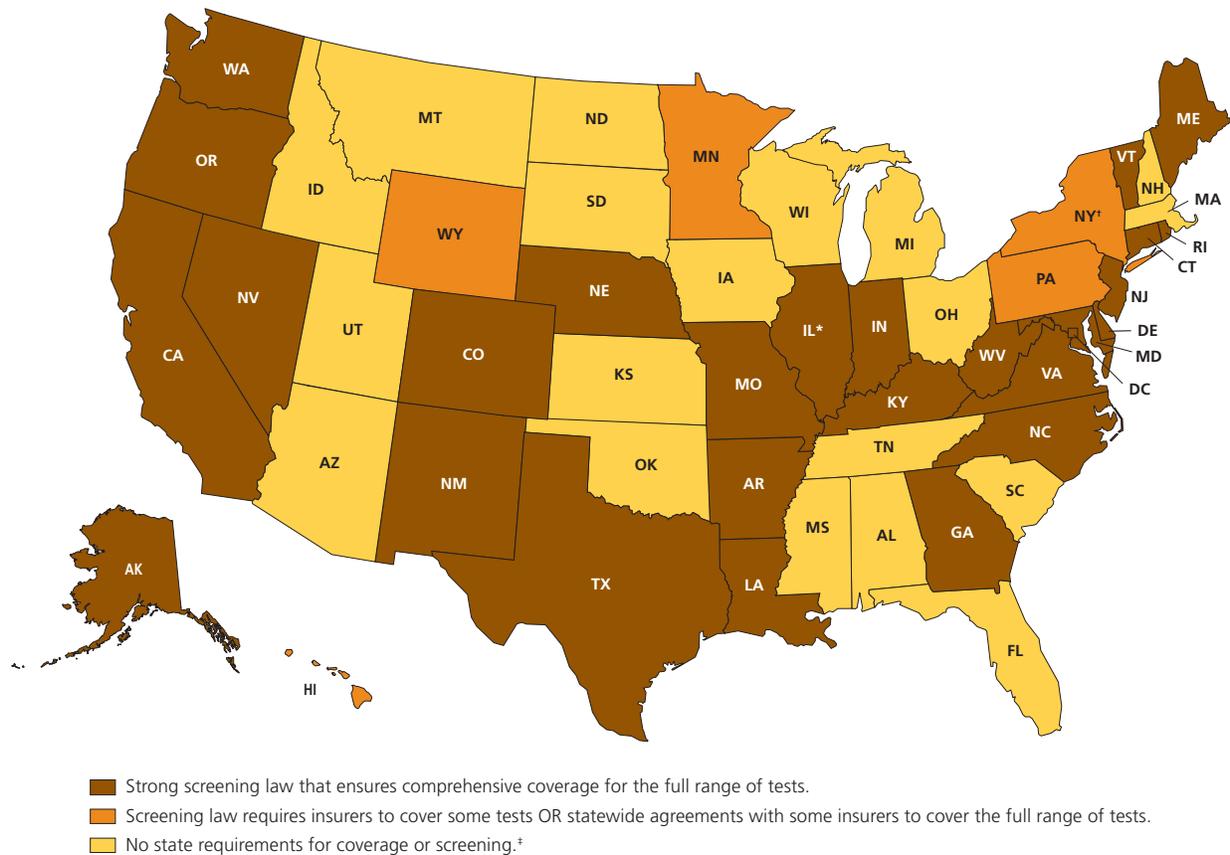
	% Fecal Occult Blood Test*					% Endoscopy†					Combined FOBT/ Endoscopy past 10 years‡
	50 years and older	50 to 64 years	65 years and older	No usual source of medical care‡	No health insurance§	50 years and older	50 to 64 years	65 years and older	No usual source of medical care‡	No health insurance§	
Alabama	13.4	10.8	17.2	10.1	8.0	57.4	51.0	66.6	29.7	22.3	59.7
Alaska	9.1	8.3	11.2	2.6	3.0	54.1	50.0	64.7	29.9	28.8	55.5
Arizona	16.3	12.8	20.9	10.1	6.3	59.2	50.7	69.9	32.7	23.0	63.2
Arkansas	12.9	9.7	17.2	6.4	5.4	51.5	45.2	59.8	27.1	22.5	55.1
California	20.1	17.4	24.3	7.8	4.9	56.6	48.8	68.8	19.4	11.3	62.1
Colorado	14.4	11.9	19.0	4.1	4.9	58.4	52.7	68.8	23.1	27.5	62.7
Connecticut	15.7	13.4	18.9	2.9	5.8	67.0	63.4	72.1	37.2	49.4	69.4
Delaware	13.2	10.8	16.4	7.5	6.8	72.1	69.0	76.4	41.3	54.7	73.9
District of Columbia	18.3	16.9	20.3	5.8	13.7	66.0	61.4	72.6	36.8	34.0	68.3
Florida	21.0	17.6	24.9	9.0	11.2	61.7	54.1	70.4	32.0	26.0	66.0
Georgia	16.5	15.2	18.9	11.9	10.3	59.8	53.7	70.4	34.1	32.0	64.3
Hawaii	18.5	16.3	21.5	9.6	6.3	56.8	50.3	65.4	33.1	27.9	62.3
Idaho	11.6	9.8	14.3	2.8	5.3	52.1	44.5	64.0	25.0	19.7	55.4
Illinois	10.9	9.5	12.9	5.4	7.4	56.1	50.1	64.7	26.7	34.3	59.1
Indiana	12.3	9.4	16.5	4.4	4.9	56.2	50.1	65.2	28.8	22.2	58.7
Iowa	14.8	12.7	17.4	4.9	10.7	60.3	55.1	66.8	38.7	27.7	63.9
Kansas	14.9	12.1	18.9	7.5	4.4	58.6	53.1	66.3	25.4	29.1	62.3
Kentucky	11.0	9.5	13.2	6.2	14.4	60.2	56.4	65.8	27.5	35.9	63.2
Louisiana	16.9	15.0	19.7	10.6	12.1	50.1	46.1	56.1	28.0	27.5	55.4
Maine	18.1	14.3	23.7	6.0	9.6	70.1	66.6	75.2	39.9	41.1	74.0
Maryland	14.6	12.1	18.7	8.6	4.2	68.7	64.7	75.2	40.9	37.8	71.0
Massachusetts	17.0	13.6	21.7	7.7	9.4	69.3	67.9	71.2	36.1	39.8	72.1
Michigan	14.6	12.8	17.3	4.3	8.0	64.1	59.4	71.3	22.0	35.5	66.3
Minnesota	8.0	5.3	12.1	2.7	2.9	67.9	62.8	75.6	31.9	28.2	69.1
Mississippi	14.5	13.0	16.6	11.2	6.2	52.8	46.4	62.2	27.1	16.8	56.1
Missouri	10.6	8.5	13.6	5.7	6.5	58.0	53.1	65.1	21.5	27.5	60.8
Montana	13.9	12.7	15.6	6.1	8.0	53.1	44.9	65.5	28.7	18.6	57.6
Nebraska	12.6	10.0	16.1	6.0	9.1	55.6	51.3	61.4	31.7	26.2	59.2
Nevada	12.3	9.2	17.3	6.4	1.9	51.3	44.4	62.3	19.5	16.3	54.7
New Hampshire	15.9	12.5	21.4	4.7	8.2	69.4	65.0	76.5	33.2	37.6	72.2
New Jersey	14.5	13.3	16.4	7.3	6.4	56.5	52.7	62.0	28.1	26.3	60.7
New Mexico	12.1	10.2	14.9	7.1	7.7	52.8	45.4	63.6	25.4	14.8	57.2
New York	12.4	10.3	15.4	5.4	6.6	63.6	58.3	71.1	28.6	33.5	66.2
North Carolina	16.8	14.3	20.6	7.7	6.8	64.1	59.0	71.7	33.1	28.6	66.9
North Dakota	13.5	11.4	16.1	5.3	9.6	54.9	46.1	65.9	31.8	28.9	58.9
Ohio	13.3	11.2	16.4	5.2	9.2	57.3	52.0	65.1	21.6	26.6	60.8
Oklahoma	11.4	9.8	13.4	3.9	7.6	51.5	44.5	60.7	20.8	20.4	54.9
Oregon	14.8	11.7	19.5	5.1	5.9	62.8	57.1	71.5	22.9	27.6	65.5
Pennsylvania	12.2	10.0	14.9	11.9	10.9	59.4	54.5	65.7	24.9	32.0	62.8
Rhode Island	14.0	11.4	17.7	2.4	8.6	67.2	62.6	73.8	30.4	39.2	70.2
South Carolina	13.0	11.2	15.6	5.6	8.4	62.3	58.3	68.1	24.2	34.1	65.2
South Dakota	13.8	11.9	16.2	8.4	5.6	59.3	51.2	69.6	27.9	32.4	62.5
Tennessee	14.4	13.8	15.3	8.1	5.3	57.2	51.5	66.0	33.8	32.2	60.9
Texas	13.3	11.2	16.8	4.6	5.7	53.5	46.8	64.4	25.3	22.8	56.4
Utah	4.9	4.5	5.6	5.1	5.4	63.9	58.2	73.0	33.4	30.8	64.8
Vermont	13.1	9.8	18.4	2.9	9.4	66.7	63.4	72.2	30.5	35.0	69.7
Virginia	14.2	13.0	16.1	7.0	13.8	67.4	63.3	74.0	44.3	35.1	70.1
Washington	16.0	13.1	21.0	6.2	6.4	62.9	56.9	72.7	32.4	29.9	66.1
West Virginia	15.6	13.2	18.8	8.6	8.5	51.3	46.8	57.2	21.6	18.5	56.3
Wisconsin	10.1	6.8	15.0	2.0	4.9	64.7	57.8	74.9	26.4	29.1	66.6
Wyoming	11.4	10.1	13.5	7.2	6.1	52.3	45.1	64.3	27.4	27.4	56.5
United States#	14.8	12.5	18.1	6.8	7.4	59.6	53.8	68.1	27.6	26.2	63.1
Range	4.9-21	4.5-17.6	5.6-24.9	2-11.9	1.9-14.4	50.1-72.1	44.4-69	56.1-76.5	19.4-44.3	11.3-54.7	54.7-74

*A fecal occult blood test within the past year. †A sigmoidoscopy or colonoscopy within the preceding 10 years. ‡Adults 50 and older who reported that they did not have a personal doctor or health care provider. §Adults 50 to 64 who reported that they did not have any kind of health care coverage, including health insurance, prepaid, plans such as HMOs, or government plans such as Medicare. ¶A fecal occult blood test within the past year or a sigmoidoscopy or colonoscopy within the preceding 10 years. Note: The colorectal cancer screening prevalence estimates do not distinguish between examinations for screening or diagnosis. #See Statistical Notes for definition.

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

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Figure 4E. Colon and Rectum Cancer Screening Coverage Legislation, by State, US, 2010



Source: Health Policy Tracking Service & Individual state bill tracking services. Provided by American Cancer Society Cancer Action Network, September, 2009.

*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 effort with the American Cancer Society. ‡Law requires insurers to offer coverage but is limiting because it does not guarantee coverage.

beneficiaries who are due for screening, informing physicians about Medicare colorectal cancer screening coverage, and including colorectal cancer screening measures in Medicare quality improvement initiatives.

The Society and ACS CAN are currently involved in health care reform at the federal level to eliminate the current cost-sharing requirement for preventive services such as mammography and colonoscopy.

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

Initiatives

The National Colorectal Cancer Roundtable (NCCRT), co-founded by the Society and the CDC, is a national coalition of public, private, and voluntary organizations, and invited experts dedicated to reducing the incidence of – and mortality – from colorectal cancer in the US through coordinated leadership, strategic planning, and advocacy. The roundtable taps into the expertise of its member organizations to create tools, conduct studies, develop consensus on outreach, and support projects that can advance the community’s overall work in this area. Some of these projects include the creation of the blue star symbol to signify the fight against colon cancer and the development of a colorectal cancer Clinician’s Evidence-based Toolbox and Guide. The NCCRT has been involved in communication efforts with health care providers to remind them about their crucial role in getting patients screened for colorectal cancer. (More information on health professional resources is available at cancer.org/colonmd.)

The American Cancer Society has developed an educational video and an information resource kit explaining the various colorectal cancer screening options to help consumers talk with their physicians and decide what is best for them. (More information on these and other programs can be found in the *Colorectal Cancer Facts & Figures, Special Edition 2008-2010*, which is available at cancer.org/docroot/STT/F861708_finalforweb.pdf.)

Prostate Cancer Early Detection Testing

Among US men, cancer of the prostate is the most common type of cancer (other than skin cancer) and the second leading cause of cancer death. Mortality trends for prostate cancer have been declining, and according to some experts this may suggest that early detection using the prostate-specific antigen test (PSA, a blood test to assess the levels of a protein made by the prostate) or digital rectal exam (DRE) may be beneficial. The results of two large clinical trials designed to determine the efficacy of PSA testing were recently published (June 2009). A European study found a lower risk of death from prostate cancer among men receiving PSA screening while a US study did not. Further analyses of these studies are under way. Most experts agree that the current evidence is insufficient to recommend for or against routine testing for early prostate cancer detection.¹⁸⁷ The American Cancer Society recommends that asymptomatic men who have at least a 10-year life expectancy have an opportunity to make an informed decision with their health care provider about whether to be screened for prostate cancer, after receiving information about the uncertainties, risks, and potential benefits associated with prostate cancer screening.¹⁸⁷ Prostate cancer screening should not occur without an informed decision-making process. Men at average risk should receive this information beginning at age 50; men at higher risk should receive this information at age 40 or 45 years, depending on their particular risk profile.¹⁸⁷

Prostate Cancer Testing in the US

According to the 2008 NHIS:

- The prevalence of having a PSA test in men aged 50 and older within the past year was 44.1% (Table 4G).
- Among men aged 50 and older, the least likely to have a PSA test were those who had no health insurance, American Indian and Alaska Native men, and recent immigrants (Table 4G).
- Based on the 2000 NHIS, among men who reported testing for early prostate cancer detection, 67% of men aged 50 to 74 and 66.5% of men aged 75 and older said they had a discussion about the advantages and disadvantages of the test with their doctor before PSA testing.¹⁸⁸

State-level Prostate Cancer Testing

Across states (Table 4H), the prevalence of PSA testing in 2008 for men aged 50 and older ranged from 46.4% in Alaska to 65.2% in Florida. The DRE percentages in 2008 for men aged 50 and

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

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

*A prostate-specific antigen test within the past year for men 50 and older who did not report that they had ever been diagnosed with prostate cancer. Note: The 2005 estimate for PSA screening is not comparable to estimates from 2003 and prior years. Since 2005, questions assessing PSA screening were asked among all men 40 or older, whereas prior to 2005 these questions were asked only of men 40 or older who reported ever having heard of a PSA test. †Percentages are age adjusted to 2000 US standard population. See Statistical Notes for more information. ‡Estimates should be interpreted with caution because of the small samples sizes. §Does not include Native Hawaiians and other Pacific Islanders. ¶Definition has changed such that individuals born in the US or in a US territory are reported separately from individuals born outside the US. Individuals born in a US territory have been in the US for any length of time. **Source:** National Health Interview Survey Public Use Data File 2008, National Center for Health Statistics, Centers for Disease Control and Prevention, 2009. American Cancer Society, Surveillance and Health Policy Research, 2010

older ranged from 35.2% in Nevada to 68.3% in Rhode Island. For both of these tests, use was greater among men 65 and older than in those aged 50 to 64. Across all states, men aged 50 years and older who lacked a usual source of health care and uninsured men aged 50 to 64 years were significantly less likely to have had a recent PSA or a DRE.

Cancer Screening Obstacles and Opportunities to Improve Participation

Access to affordable, quality health care continues to be a fundamental policy priority for the American Cancer Society. People who lack health insurance have less access to preventive care and are less likely to get timely cancer screening examinations.¹⁸⁹ Furthermore, studies have shown that those who lack

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

	% Recent Prostate-specific Antigen Test*					% Recent Digital Rectal Exam†				
	50 years and older	50 to 64 years	65 years and older	No usual source of medical care‡	No health insurance§	50 years and older	50 to 64 years	65 years and older	No usual source of medical care‡	No health insurance§
Alabama	62.5	59.8	67.5	34.5	39.6	45.8	43.6	49.8	28.6	40.9
Alaska	46.4	41.8	62.4	28.2	13.9	42.9	39.5	54.8	22.9	9.9
Arizona	61.4	52.0	75.6	36.2	25.3	55.4	50.8	62.6	31.9	27.0
Arkansas	57.1	51.1	67.1	26.9	28.7	47.8	43.4	55.1	17.6	24.3
California	51.4	46.4	61.0	19.6	12.4	47.5	42.7	56.6	20.4	9.5
Colorado	53.7	48.2	66.7	26.1	18.8	47.7	43.1	58.9	19.5	13.8
Connecticut	58.4	53.4	67.8	27.4	36.3	58.6	56.8	61.9	15.4	30.6
Delaware	63.3	58.4	71.9	¶	¶	53.9	52.4	56.6	¶	¶
District of Columbia	59.7	53.6	70.9	31.8	¶	57.4	52.6	66.4	24.3	¶
Florida	65.2	55.2	78.8	28.1	33.1	53.4	46.8	62.6	20.4	27.0
Georgia	58.9	53.6	71.5	26.9	28.3	48.0	44.6	55.8	21.5	16.0
Hawaii	46.5	38.7	59.2	16.4	13.4	38.3	34.5	44.5	15.9	11.1
Idaho	51.0	45.0	62.7	24.9	21.3	44.0	39.7	52.3	22.1	19.2
Illinois	53.9	50.8	59.8	20.7	¶	46.5	44.3	50.6	10.3	23.6
Indiana	55.6	47.8	71.2	19.7	19.8	48.2	44.8	54.8	19.6	21.5
Iowa	53.3	46.0	65.1	23.1	¶	48.4	45.8	52.7	24.4	29.9
Kansas	57.3	50.5	70.6	25.5	26.8	46.8	42.7	55.0	15.4	16.8
Kentucky	54.0	47.4	66.5	16.4	23.5	44.5	43.1	47.3	18.4	19.0
Louisiana	51.4	48.5	56.8	23.6	29.0	38.3	34.3	46.3	16.5	14.7
Maine	59.1	54.9	66.8	24.1	36.1	60.3	58.2	64.3	24.7	40.8
Maryland	56.9	51.0	68.4	33.3	42.6	53.7	49.5	62.1	27.1	41.7
Massachusetts	60.6	56.2	68.9	24.0	47.2	62.4	59.9	67.2	26.5	42.4
Michigan	59.0	54.7	67.6	12.2	28.7	52.6	49.6	58.6	16.6	30.4
Minnesota	48.9	43.2	60.0	20.9	¶	47.1	44.9	51.5	24.1	¶
Mississippi	56.1	51.2	65.5	28.3	20.0	45.3	41.7	52.3	21.7	22.0
Missouri	53.4	45.5	67.8	21.6	28.9	42.8	37.1	52.9	16.4	20.6
Montana	55.0	50.8	63.0	32.0	25.4	48.1	43.8	56.3	22.6	27.3
Nebraska	53.4	49.4	60.6	31.4	32.7	43.2	40.7	47.7	23.6	24.1
Nevada	53.2	47.1	65.4	24.6	25.7	35.2	29.3	47.3	14.4	14.8
New Hampshire	58.4	53.5	68.8	12.6	19.8	63.6	61.1	68.8	15.7	30.7
New Jersey	56.2	53.1	62.3	25.6	27.0	47.2	44.7	52.0	23.8	23.1
New Mexico	49.7	41.9	63.1	21.7	20.8	43.2	38.2	52.0	17.6	14.8
New York	57.3	51.3	69.0	23.9	30.1	51.6	48.3	58.2	21.4	32.4
North Carolina	59.9	54.5	70.1	20.2	22.2	56.6	53.1	63.3	22.0	25.6
North Dakota	56.2	49.1	68.5	28.3	33.4	49.7	44.3	59.3	19.7	24.6
Ohio	54.5	48.6	65.4	17.9	28.4	48.3	44.7	55.1	15.6	23.8
Oklahoma	51.6	43.1	65.7	20.0	24.0	40.2	32.6	52.9	12.1	17.7
Oregon	52.2	46.5	62.9	10.5	30.0	46.4	41.9	55.0	9.5	24.7
Pennsylvania	57.7	51.9	67.3	33.7	45.2	48.1	42.6	57.4	26.6	26.9
Rhode Island	64.4	60.6	71.4	14.1	¶	68.3	67.1	70.6	17.7	¶
South Carolina	55.0	50.0	65.0	22.4	24.0	49.3	45.7	56.5	18.8	21.8
South Dakota	60.7	52.4	75.0	28.3	32.0	49.9	44.3	59.4	19.2	34.8
Tennessee	51.4	48.3	57.3	24.6	19.7	45.0	43.8	47.3	27.4	23.6
Texas	54.1	47.7	67.4	20.4	24.9	44.0	38.6	55.4	19.2	23.9
Utah	46.7	41.1	57.5	18.2	¶	38.8	34.1	48.3	15.5	¶
Vermont	50.9	45.3	62.3	19.7	33.7	54.0	51.0	60.0	24.1	33.0
Virginia	59.6	50.9	76.6	28.3	31.8	55.6	48.7	69.3	29.0	29.3
Washington	51.1	45.9	62.0	18.6	17.8	49.3	46.4	55.5	19.7	21.1
West Virginia	59.1	50.6	73.0	23.4	31.5	45.0	37.2	57.7	22.9	16.8
Wisconsin	51.1	46.3	61.1	18.7	15.2	48.6	45.4	55.2	16.9	29.7
Wyoming	62.3	57.9	71.9	37.3	30.3	37.2	31.6	49.3	13.3	10.9
United States#	55.9	50.0	66.9	23.1	26.1	48.9	44.8	56.7	20.4	22.9
Range	46.4-65.2	38.7-60.6	56.8-78.8	10.5-37.3	12.4-47.2	35.2-68.3	29.3-67.1	44.5-70.6	9.5-31.9	9.5-42.4

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

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

American Cancer Society, Surveillance and Health Policy Research, 2010

health insurance are more likely to be diagnosed at an advanced stage of cancer, when survival rates are much lower and treatment is more expensive.^{152, 160} These patients face much more difficult and far more extensive medical treatments, as well as a diminished quality of life – avoidable outcomes if they had the same level of access as insured patients to the current advances in cancer prevention, detection, and treatment options.

In people aged 65 and older, health insurance coverage is nearly universal because of the Medicare program.^{190, 191} In contrast, health insurance coverage in the population under the age of 65 varies depending on age, employment status, and other factors. For example, 20.3% of adults aged 18 to 64 had no health insurance coverage in 2009.¹⁹² As a group, uninsured adults are more likely to have a lower income, to be Hispanic or African American, or have less education.^{189, 193} Among adults aged 18 to 64, it is estimated that 8% had Medicaid coverage and 64.2% had employer-sponsored coverage.¹⁹⁴ Even among the employed, changes in employment status can also affect health care coverage.¹⁹⁰ The number of uninsured Americans is 46 million, and millions more face shrinking coverage, higher deductibles, and periods without insurance.^{193, 195} Recent reports document that 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 coverage for 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.^{196, 197}

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.^{71, 198} Studies have shown that people who receive a clinician's recommendation for cancer screening are more likely to be screened than those who do not receive a recommendation.^{71, 198} To maximize the potential impact of interventions for improving cancer screening, a diverse set of strategies should be implemented. These include centralized or office-based systems including computer-based reminder systems to assist clinicians in counseling age-/risk-eligible patients about screening, as well as organizational support systems to help manage referrals and follow-up of cancer screening tests.^{71, 198-200} In addition, multiple interventions directed at patients (strategies to raise awareness about the importance of cancer screening), physicians (strategies for cancer screening counseling and follow-up), and health care systems (strategies to ensure the delivery of high-quality and timely cancer screening) may provide the best approaches to improving rates of cancer screening.^{198, 201} Efforts among the American Cancer Society and partners in the nonprofit sector, health care, and government



are under way to implement interventions, integrate screening into routine care, and address health disparities through health care reform.

For decades, our nation's health care system has not adequately met the needs of people with cancer, many of whom were denied coverage, offered inadequate policies that did not cover pre-existing conditions, or charged far more than they could afford for the care they needed. In March 2010, Congress passed and the president signed health care reform legislation that includes several provisions that will meaningfully improve the health care system for cancer patients. The Society's Divisions and ACS CAN have played a large role in supporting the need for meaningful health insurance that will help improve the health care system for cancer patients, survivors, and their families.

ACS CAN has analyzed the legislation and believes it will meet the Society's and ACS CAN's priorities for meaningful reform by:

- Increasing the emphasis on disease prevention, such as by reducing or eliminating out-of-pocket costs for lifesaving cancer screenings
- Guaranteeing access to quality, affordable health care, regardless of whether one has a pre-existing health condition
- Emphasizing the patients' quality of life, such as by improving care for cancer-related pain

ACS CAN is working to ensure that the new law is implemented as effectively as possible for people with cancer and is strengthened through the continuing legislative and regulatory processes. For more information about ACS CAN's efforts in support of meaningful health care reform, visit acscan.org/healthcare.

Statistical Notes

Sample Surveys

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

Prevalence: The percentage of people exhibiting the behavior out of the total number in the defined population. For example, in 2004, 60.5% of Florida women aged 40 years and older had a mammogram within the past year. The percentage of people exhibiting the behavior is 60.5%, and the defined population is women aged 40 and older living in Florida in 2004.

Population: A group of people defined by the survey. For example, the Behavioral Risk Factor Surveillance System (BRFSS) targets adults 18 and older, and the Youth Risk Behavior Surveillance System (YRBSS) targets students in grades nine 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 city, state, or nationwide.

Sample: A smaller group of people chosen from the population defined by the survey. The sample is chosen based on the age, race, ethnic, and gender demographics of 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 nationwide. Once the sample of the population has completed the survey, statistical analyses are conducted to extrapolate the surveyed group's responses to the entire popula-

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

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

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

Other Statistical Terms

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

Confidence interval: A range of possible values for the estimated prevalence. A 90% confidence interval is one that will contain the true value in 90 out of 100 samples surveyed. Similarly, a 95% confidence interval will contain the true value in 95 out of 100 samples surveyed. A 95% confidence interval is commonly reported, and the accompanying table reports the confidence interval ranges for the survey data. Example: The confidence interval range for current cigarette smoking among adults is between 0.7% and 2.7%. The narrowest confidence interval is around the percentage for Washington (16.8%±0.7%) or (16.1, 17.5), and the percentage for Alaska has the widest range of possible values (22.2%±2.7%) or (19.5, 24.9).

Confidence Interval (CI) Ranges for Percentages Listed in Tables, by State, CPED 2010

Table	Description	95% CI Range
1A	Current cigarette smoking, high school students, total	± 1.4% to 7.0%
1B	Current cigarette smoking, adults 18 and older	± 0.7% to 2.5%
	Current cigarette smoking, men 18 and older	± 1.2% to 3.8%
	Current cigarette smoking, women 18 and older	± 0.8% to 3.3%
2A	At risk for becoming overweight, high school students, total	± 1.3% to 3.2%
	Overweight, high school students, total	± 1.1% to 3.8%
	Met currently recommended levels of physical activity, high school students, total	± 1.9% to 7.6%
	Ate fruits and vegetables five or more times a day, high school students, total	± 1.3% to 4.0%
2B	Clinical overweight, adults 18 and older	± 0.9% to 3.0%
	Clinical obese, adults 18 and older	± 0.8% to 2.6%
	No leisure-time physical activity, adults 18 and older	± 0.7% to 2.6%
	Moderate physical activity, adults 18 and older	± 0.9% to 3.1%
	Vigorous physical activity, adults 18 and older	± 0.9% to 3.3%
	Eating five or more fruits and vegetables a day, adults 18 and older	± 0.8% to 2.8%
4B	Recent mammogram, women 40 and older	± 1.2% to 4.5%
	Recent mammogram, women 65 and older	± 1.8% to 9.2%
4D	Recent Pap test, women 18 and older	± 1.2% to 4.2%
	Recent Pap test, women 65 and older	± 2.6% to 13.2%
4F	Recent fecal occult blood test, adults 50 and older	± 0.7% to 2.2%
	Recent sigmoidoscopy or colonoscopy, adults 50 and older	± 1.0% to 4.1%
4H	Recent prostate-specific antigen test, men 50 and older	± 1.8% to 6.2%
	Recent digital rectal examination, men 50 and older	± 1.7% to 6.1%

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

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

US definition for state tables: The state-based BRFSS data were aggregated to represent the US. Thus, the median BRFSS values for all US states/territories published by the Centers for Disease Control and Prevention (CDC) will differ from these. Due to the differences in sampling methodology and survey methods, this percentage may not be the same as the percentage reported by the National Health Interview Survey (NHIS).

Survey Sources

The statistics reported in this publication are compiled from several different publicly available surveys designed to provide prevalence estimates of health-related behaviors and practices for a city, state, or nationwide. The survey design varies; some surveys provide prevalence estimates on a national level, whereas some surveys provide estimates on a state level. A brief description of each survey follows:

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

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

National Health Interview Survey (NHIS). The NHIS is a survey of the CDC's National Center for Health Statistics (NCHS). The survey is designed to provide national prevalence estimates on personal, socioeconomic, demographic, and health characteristics (such as cigarette smoking and physical activity) of US

adults. Data are gathered through a computer-assisted personal interview of adults aged 18 and older living in households in the US. The NHIS is an annual survey and has been conducted by NCHS since 1957. For more information, visit the NHIS Web site at cdc.gov/nchs/nhis.htm.

National Youth Tobacco Survey (NYTS). The NYTS was conducted by the CDC in 2004, and was previously funded by the American Legacy Foundation. The survey is designed to provide national data for public and private students in grades six through 12. It allows for the design, implementation, and evaluation of a comprehensive tobacco-control program with more detailed tobacco-related questions than the YRBSS, including those on nontraditional tobacco products such as bidis, secondhand-smoke exposure, smoking cessation, and school curriculum. Data are gathered through a self-administered questionnaire completed during a required subject or class period. The NYTS was first conducted in fall 1999, again in spring 2000, and has been subsequently conducted every other year.

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

Youth Risk Behavior Surveillance System (YRBSS). The YRBSS is a survey of the CDC's National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP). The survey is designed to provide national, state, and local prevalence estimates on health risk behaviors, such as tobacco use, unhealthy dietary behaviors, physical inactivity, and others among youth and young adults who attend public and private high schools. Different statistical methods are used to choose the representative sample for the national, state, and local prevalence estimates. (See Statistical Notes, page 48.) Data are gathered through a self-administered questionnaire completed during a required subject or class period. The YRBSS is a biennial survey that began in 1991. The state and local surveys are of variable data quality, and caution should be used in comparing data among them. Data from states and local areas with an overall response rate of 60% and appropriate documentation are considered weighted and are generalized to all public and private

high school students in grades nine through 12 in the respective jurisdiction. However, data from states and local areas without an overall response rate of 60% and those with inadequate documentation are reported unweighted and are only applicable to students participating in the survey. Beginning with the 2003 survey, state data that do not meet the weighting requirements described above will no longer be made publicly available through the CDC. For more information, visit the YRBSS Web site at cdc.gov/HealthyYouth/yrbs/index.htm.

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