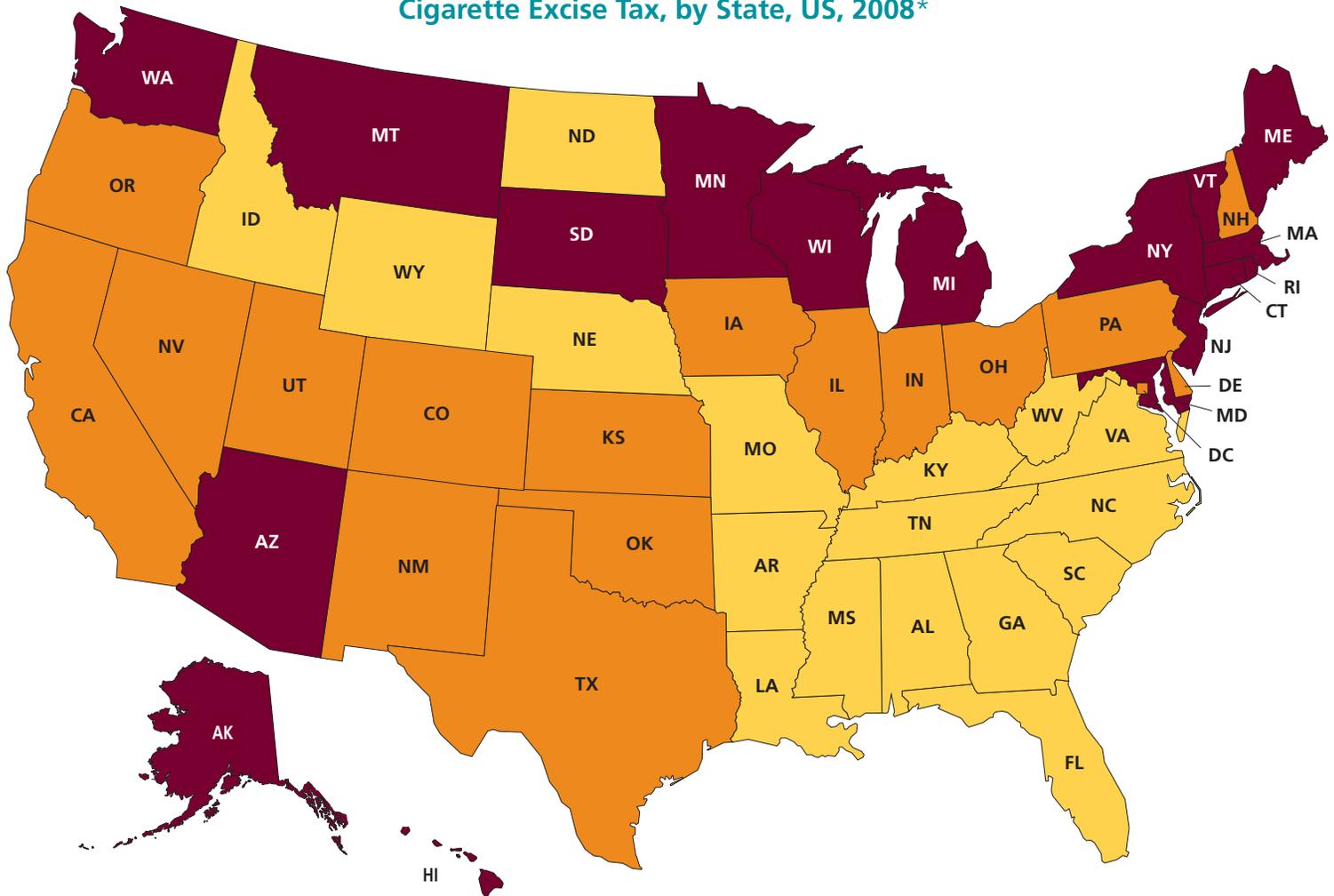


Cancer Prevention & Early Detection Facts & Figures

2008

Cigarette Excise Tax, by State, US, 2008*



*Reported as of November 30, 2007. Note. At the time of publication of this report, scheduled tax increases in Hawaii (\$0.2) and Vermont (\$0.2) as reported here, were not yet in effect.

Source: Campaign for Tobacco-Free Kids, et al. Cigarette tax increases by state per year, 2000-2008. National Center for Tobacco-Free Kids, 2007.

- Top third (greater than or equal to \$1.45)
- Middle third (between 67 cents and \$1.44)
- Bottom third (below 67 cents)

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

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Preface

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 2008 about 170,000 cancer deaths will be caused by tobacco use alone. In addition, approximately one-third (188,550) of the 565,650 cancer deaths expected to occur in 2008 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 eliminate cancer as a major public health problem by preventing cancer, saving lives, and diminishing suffering from cancer, through research, education, advocacy, and service. In 1999, the 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

Highlights, CPED 2008

Tobacco

- Tobacco control works. An estimated 40% of the reduction in male cancer deaths between 1991 and 2003 can be attributed to smoking declines in the last half century. However, 20.8 % of adults and 23% of high school students continue to smoke.
- Compared to quitting completely, the use of any smokeless tobacco product as a substitute for smoking is harmful. Despite this evidence, the tobacco industry is aggressively marketing new and existing smokeless tobacco products as "bridge" products, i.e. supplemental sources of nicotine in smoke-free settings.
- Twenty-nine states, the District of Columbia, and Puerto Rico have passed laws that protect nonsmokers by prohibiting smoking in workplaces and/or restaurants and/or bars.
- According to the 2007 Centers for Disease Control and Prevention (CDC) *Best Practices for Comprehensive Tobacco Control Programs*, funding all state tobacco control programs at their recommended level for five years would result in an estimated 5 million fewer smokers in the US.⁴
- In 2008, states allocated a total of \$717.2 million for tobacco control programs, the highest level in six years. Only Maine, Colorado, and Delaware met or exceeded 1999 CDC minimum recommended levels for tobacco funding. Meanwhile, the tobacco industry continues to outspend tobacco control by a ratio of nearly 24 to 1.

Overweight and Obesity, Physical Activity, and Nutrition

- The American Cancer Society *Guidelines on Nutrition and Physical Activity for Cancer Prevention* highlight the importance of maintaining a healthy weight and regular physical activity for the prevention of many types of cancer.

- Currently, an estimated 17.1% of adolescents are overweight and 35.2% of adults are obese.

Cancer Prevention and Screening

- Mammography usage has not increased since 2000. In 2005, 66.5% of women aged 40 and older reported getting a mammogram in the past two years. Women who lack health insurance have the lowest breast cancer screening rates.
- Vaccination against certain types of human papillomavirus (HPV) offers a new approach to the prevention of cervical cancer. The Society supports the widest possible coverage of the FDA-approved vaccine against HPV for recommended populations through private and public systems. Vaccination should supplement rather than replace Pap screening, according to American Cancer Society guidelines for immunization released in 2007.
- New American Cancer Society consensus guidelines for the prevention and early detection of colorectal cancer provide physicians and the public with evidence-based, quality-focused information and recommendations.
- About half (46.8%) of Americans aged 50 and older have had a recent colorectal cancer screening test. To date, 22 states and the District of Columbia have passed legislation ensuring coverage for the full range of colorectal cancer screening tests.

UV Radiation and Skin Cancer

- Excessive exposure to sunlight or artificial ultraviolet radiation from indoor tanning sources is a significant risk factor for several types of skin cancer. Preventive behaviors such as avoiding sun exposure at peak hours of the day, avoiding indoor tanning, wearing protective hats and clothing, and proper use of sunscreen are recommended to reduce the harmful effects of such exposure.

developed nationwide objectives for prevention and early detection that set the framework for achieving the 2015 goals (see sidebar). 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.

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 affect not only 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. For example, at the federal level the American Cancer Society has advocated for increased funding of the Centers for Disease Control and Prevention's (CDC) National Breast and Cervical Cancer Early Detection program to assist low-income and uninsured women in obtaining cancer screening and treatment. 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 non-smokers from tobacco smoke in public places. These and other community, policy, and legislative initiatives are highlighted in this publication.

American Cancer Society Challenge Goals and Objectives

2015 Challenge Goals

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

2015 Nationwide Objectives

Adult Tobacco Use

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

Youth Tobacco Use

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

Nutrition & Physical Activity

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

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

Comprehensive School Health Education

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

Sun Protection

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

Breast Cancer Early Detection

- Increase to 90% the proportion of women aged 40 and older who have breast cancer screening consistent with American Cancer Society guidelines (by 2010)

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

Tobacco use remains the single largest preventable cause of disease and premature death in the US. Each year, smoking results in an estimated 438,000 premature deaths, of which about 38,000 are in nonsmokers as a result of exposure to secondhand smoke. Smoking also accounts for \$167 billion in health care expenditures and productivity losses.⁵

Youth Tobacco Use

Most smokers become addicted to tobacco before they are legally old enough to buy cigarettes. Addiction develops rapidly in those who experiment with tobacco.^{6,7} Most adolescents who become regular smokers continue to smoke into adulthood.⁸ 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.⁸

Current Patterns and Trends in Cigarette Smoking

- In 2005, data from the Youth Risk Behavior Survey showed that 23% of high school students reported current cigarette smoking (smoking at least one day in the past 30 days) and 9.4% reported frequent smoking (defined as smoking for 20 or more of the past 30 days) (Table 1A).⁹
- Although the percentage of high school students who smoke cigarettes decreased from 1997 to 2003, the rate of decrease appears to be slowing, as the prevalence did not change significantly between 2003 and 2005.⁹ Smoking rates for all gender and racial/ethnic groups did not differ significantly between 2003 and 2005.⁹
- The latest data from the Monitoring the Future survey shows that smoking declines may have resumed for eighth-graders in 2007. Continued monitoring is required to see whether this trend continues and extends to other sub-groups, as well.
- According to the Monitoring the Future survey, cigarette smoking varies by race/ethnicity among 12th-graders, with prevalence being highest among non-Hispanic whites, intermediate among Hispanics/Latinos, and the lowest among African Americans (Figure 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



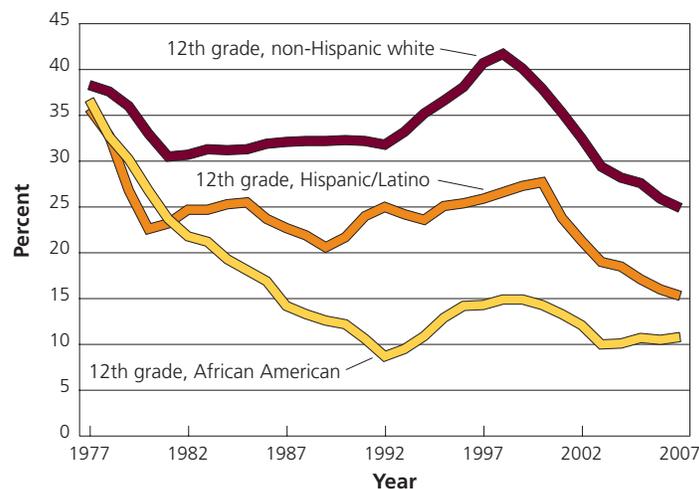
public smoking, and counter-advertising.¹⁰⁻¹³ The recent stall in the rate of decline may be related to increases in tobacco industry expenditures on marketing and promotions, declines in funding for comprehensive tobacco control programs, and a lack of substantial increases in retail cigarette price due to extensive industry price discounting.⁹

Other Tobacco Products

While cigarettes remain the primary tobacco product used by youth, cigars, smokeless tobacco products, and hookahs (tobacco waterpipes) have grown in popularity. Table 1A provides data on current cigar and smokeless tobacco use among high school students in states and cities for which these data were available for 2005.

- In 2005, 28.4% of high school students reported current use of any tobacco product.¹⁴ Of these products, cigarettes (23%) were most commonly used followed by cigars (14%) and smokeless tobacco products (8%).¹⁴

Figure 1A. Current* Cigarette Smoking Among 12th Graders, by Race/Ethnicity, US, 1977-2007



*Used cigarettes in the past 30 days.

Source: Monitoring the Future survey, 1975-2007, University of Michigan.

American Cancer Society, Surveillance Research

Table 1A. Tobacco Use, High School Students, by State and City/County, US, 2005

Location	% Current cigarette smoking*	Rank†	% Frequent cigarette smoking‡	% Current cigar use§	% Current smokeless tobacco use¶
United States	23.0		9.4	14.0	8.0
Alabama	24.4	31	10.2	18.7	14.1
Arizona	21.4	22	7.5	N/A	N/A
Arkansas	25.9	36	13.4	17.6	13.7
Colorado	18.7	14	6.4	16.4	9.1
Connecticut	18.1	12	7.5	N/A	N/A
Delaware	21.2	20	9.6	11.3	5.1
Florida	17.2	9	6.4	12.3	5.9
Georgia	17.2	10	7.0	15.1	7.4
Hawaii	16.4	6	4.8	N/A	N/A
Idaho	15.8	2	6.0	13.8	9.1
Indiana	21.9	24	10.6	15.6	8.6
Iowa	22.2	26	9.7	14.5	7.9
Kansas	21.0	19	8.9	14.7	10.8
Kentucky	26.2	37	14.4	15.5	14.8
Maine	16.2	4	7.9	14.1	6.9
Maryland	16.5	7	7.4	11.6	2.9
Massachusetts	20.5	17	8.9	13.5	4.4
Michigan	17.0	8	7.8	13.3	6.9
Missouri	21.3	21	10.8	14.7	6.9
Montana	20.1	16	8.8	17.6	14.8
Nebraska	21.8	23	9.6	16.8	8.7
Nevada	18.3	13	7.1	N/A	5.9
New Hampshire	20.5	18	8.6	17.7	6.5
New Jersey	19.8	15	7.0	N/A	N/A
New Mexico	25.7	35	7.8	21.3	8.5
New York	16.2	5	6.3	9.6	4.2
North Carolina	24.9	33	11.0	N/A	N/A
North Dakota	22.1	25	11.9	12.2	11.2
Ohio	24.4	32	12.8	N/A	7.9
Oklahoma	28.6	40	10.7	16.2	11.0
Rhode Island	15.9	3	8.3	12.3	4.2
South Carolina	23.5	29	11.4	15.3	10.7
South Dakota	28.2	39	14.5	N/A	12.7
Tennessee	26.3	38	13.7	16.5	14.0
Texas	24.2	30	7.5	17.1	7.6
Utah	7.4	1	2.1	5.4	3.7
Vermont	17.9	11	8.0	N/A	7.9
West Virginia	25.3	34	13.6	15.6	14.9
Wisconsin	22.8	28	10.7	17.1	8.4
Wyoming	22.5	27	10.1	N/A	14.3
Baltimore, MD	10.1	5	4.2	7.5	2.0
Boston, MA	15.3	17	5.0	7.2	2.7
Broward County, FL	13.7	13	5.1	9.8	3.6
Charlotte-Mecklenburg, NC	19.7	21	7.2	N/A	N/A
Chicago, IL	14.4	15	3.9	13.0	2.2
Dallas, TX	17.5	18	2.5	19.5	2.4
Dekalb County, GA	8.8	2	2.5	10.1	2.2
Detroit, MI	6.4	1	1.2	7.3	2.0
District of Columbia	9.2	3	2.0	6.3	1.8
Hillsborough County, FL	17.6	19	6.5	14.7	7.7
Los Angeles, CA	11.8	9	1.4	9.5	1.6
Memphis, TN	9.6	4	2.6	16.6	1.8
Miami-Dade County, FL	12.8	10	3.4	8.4	1.8
Milwaukee, WI	13.1	12	5.1	16.6	2.7
New Orleans, LA	11.0	7	3.4	11.5	6.0
New York City, NY	11.2	8	3.6	5.7	3.4
Orange County, FL	17.6	20	6.4	11.6	3.8
Palm Beach County, FL	12.9	11	4.9	10.0	3.6
San Bernardino, CA	14.7	16	4.2	13.1	3.9
San Diego, CA	14.2	14	3.5	11.6	3.4
San Francisco, CA	10.9	6	3.7	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, 2005, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention. *MMWR Surveill Summ.* 2006;55(5);1-108.

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- Non-Hispanic white and Hispanic/Latino students predominantly smoke cigarettes, while non-Hispanic African Americans are equally likely to smoke cigarettes and cigars.¹⁴
- While the use of smokeless tobacco among high school boys declined significantly from 19.2% in 1993 to 11% in 2003, this decline seems to have stalled in 2005 (13.6%). Use among high school girls remains low and has changed little in this time period (1.3% to 2.2%).¹⁴
- Male and female students were equally likely to smoke cigarettes. By comparison, males were six times more likely to use smokeless tobacco products and two times more likely to smoke cigars than females.¹⁴
- In 2004, 2.4% of middle school and 2.7% of high school students used bidis (small brown cigarettes from India made of tobacco wrapped in a leaf and tied with a thread) on one or more of the 30 days preceding the survey.^{15,16} Similarly, 1.6% of middle school and 2.5% of high school students used kreteks (flavored cigarettes containing tobacco and clove extract) on one or more of the 30 days preceding the survey.^{15,16}
- An emerging trend among adolescent and young adult smokers is the use of tobacco waterpipes or “hookahs.”

While there are no national estimates of the use of this product, adolescent and young adult smokers are more likely to be susceptible to its use because of the marketing and promotions of hookah bars and cafes targeting these groups and the misperceptions about the harms of tobacco use from hookahs.¹⁷

Use of tobacco in any form may induce nicotine dependence.¹⁸ Prevention and cessation programs should include other tobacco products in addition to cigarettes.¹⁹

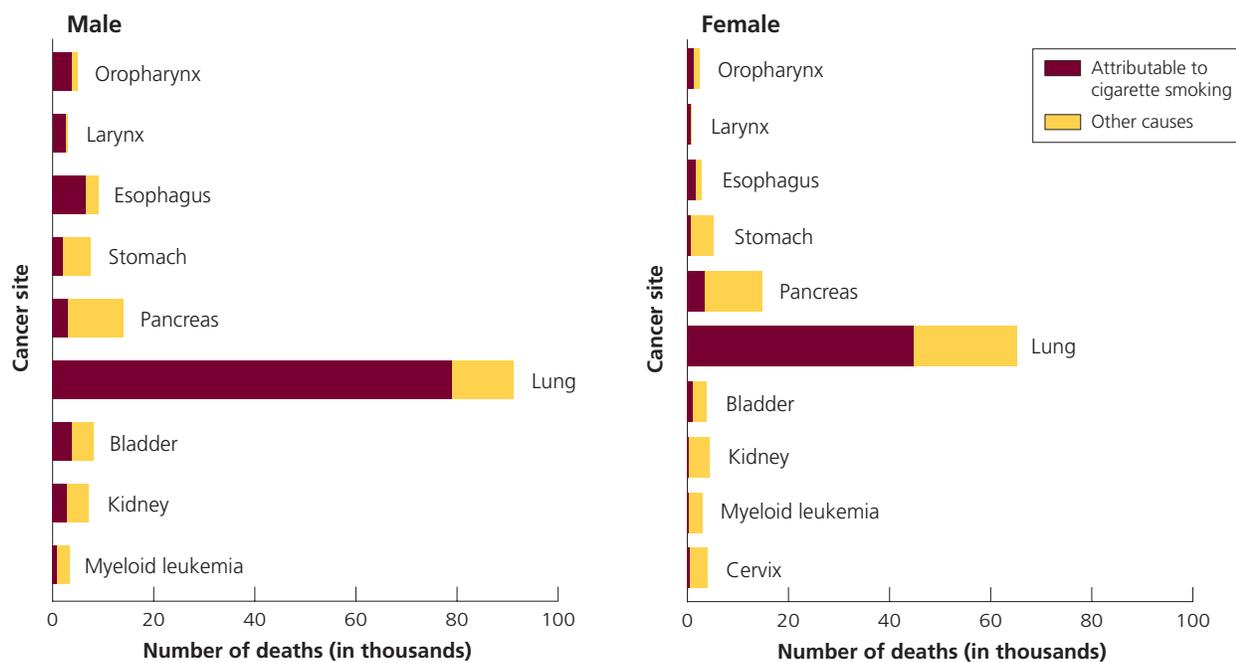
Adult Tobacco Use

Tobacco use increases the risk of cancer of the lung, mouth, nasal cavities, larynx, pharynx, esophagus, stomach, pancreas, kidney, bladder, uterine cervix, and myeloid leukemia.²⁰ Exposure to secondhand smoke increases the risk of lung cancer.^{21,22} Thirty percent of cancer deaths, including 87% of lung cancer deaths, can be attributed to tobacco.^{2,20,22} (Figure 1B)

Current Patterns and Trends in Cigarette Smoking

Current numbers in cigarette use represent a dramatic decline in both consumption and the prevalence of smoking in the US since the release of the first US Surgeon

Figure 1B. Annual Number of Cancer Deaths Attributable to Smoking, Males and Females, by Site, US, 1997-2001



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

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General's Report on Smoking and Health in 1964. However, progress in reducing smoking prevalence has stalled in the past two years, and smoking rates remain high among some population subgroups.

- 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. In the past two years, these rates remained essentially unchanged at 23.9% in men and 18.0% in women in 2006 (Table 1B). Currently, an estimated 80.1% of smokers smoke cigarettes daily.²³
- The largest disparities in smoking prevalence are by socioeconomic status, race/ethnicity, and state of residence.
- Adults without a high school degree are almost three times more likely to be current smokers than those with a college degree (Figure 1C, Table 1B).
- The prevalence of smoking among American Indian/Alaska Native men and women is the highest among all racial/ethnic groups and is more than three times that of Asian men and women (Table 1B).

Table 1B. Current Cigarette Use*, Adults 18 and Older, US, 2006

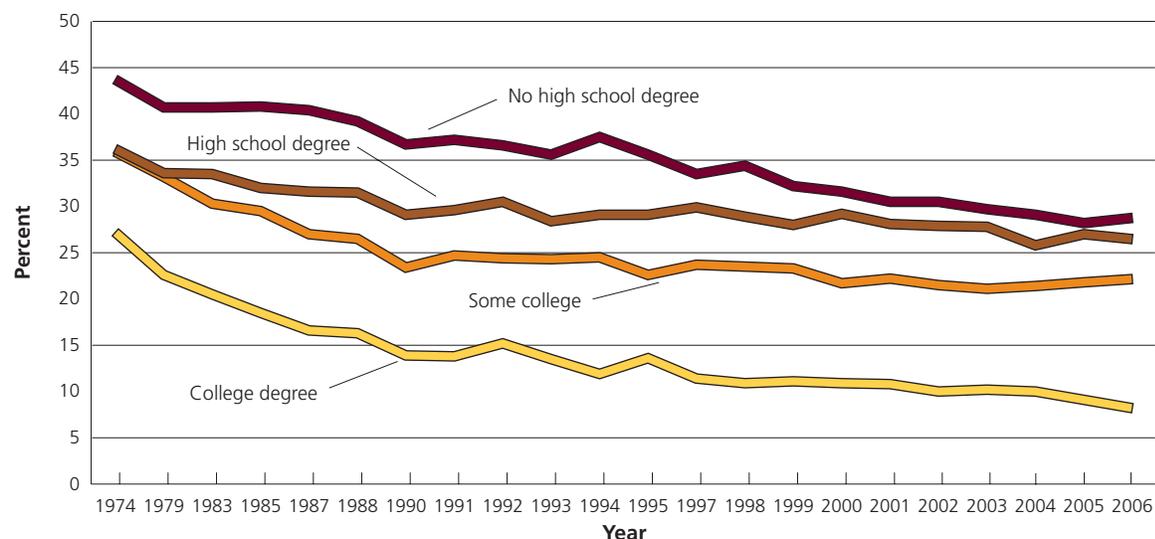
Characteristic	% Men	% Women	% Total
Age group (years)			
18 to 24	28.5	19.3	23.9
25 to 44	26.0	21.0	23.5
45 to 64	24.5	19.3	21.8
65 or older	12.6	8.3	10.2
Race/ethnicity			
White (non-Hispanic)	24.3	19.7	21.9
African American (non-Hispanic)	27.6	19.2	23.0
Hispanic/Latino	20.1	10.1	15.2
American Indian/Alaska Native (non-Hispanic) [†]	35.6	29.0	32.4
Asian (non-Hispanic) [‡]	16.8	4.6	10.4
Education (years)[§]			
8 or fewer	22.3	12.3	17.4
9 to 11	40.1	31.4	35.4
12 (no diploma)	30.6	23.0	26.7
GED diploma [¶]	51.3	40.2	46.0
12	27.9	23.3	25.6
13 to 15	26.1	20.0	22.7
AA degree	25.4	17.8	21.2
16	10.8	8.4	9.6
More than 16	7.3	5.8	6.6
Total	23.9	18.0	20.8

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

Source: National Health Interview Survey, 2006, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention. Cigarette smoking among adults – United States, 2006. *MMWR Morb Mortal Wkly Rep.* 2006;56(44):1157-1161.

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Figure 1C. Current* Cigarette Smoking by Education[†], Adults 25 and Older, US, 1974-2006



*Adults 25 and older who have ever smoked 100 cigarettes in their lifetime and who are current smokers (everyday or someday). †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 older.

Source: 1974-2004: National Center for Health Statistics, Health, United States, 2006. With Chartbook on Trends in the Health of Americans. Hyattsville, Maryland, 2006. 2005 & 2006: National Health Interview Survey Public Use Data File, 2005 & 2006. National Center for Health Statistics, Centers for Disease Control and Prevention, 2006 & 2007.

American Cancer Society, Surveillance Research

- The state with the highest smoking prevalence (Kentucky, 28.6%) has a rate that is almost three times that of the state with the lowest prevalence (Utah, 9.8%) (Table 1C).

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.^{24,25}

Cigar Smoking

Cigar smoking increases the risk of cancers of the lung, oral cavity, larynx, esophagus, and probably pancreas. Cigar smokers are 4 to 10 times more likely to die from laryngeal, oral, or esophageal cancers than nonsmokers.²⁶

- In 2005, 6% of adults, 10% of men, and 2% of women, aged 18 years and older had smoked cigars in the past month.²⁷
- The consumption of large cigars and cigarillos increased by an estimated 148% from 1993-2006.^{28,29}

Smokeless Tobacco

Smokeless tobacco products, including chewing tobacco and snuff, are not safe substitutes for smoking cigarettes or cigars. These products cause oral and pancreatic cancer, noncancerous oral conditions, and can lead to nicotine addiction.³⁰ Compared to quitting completely, switching to any smokeless product as a substitute for smoking has been shown to be harmful.^{31,32}

- Data from the National Health Interview Survey indicate that between 1987 and 2000, the current use of chewing tobacco or snuff declined among men from 6.1% to 4.5% and remained relatively low among women (0.6% to 0.3%). In 2005, these rates remained constant at 4.5% among men and 0.2% among women.^{25,33}
- In 2005, according to data from the National Survey on Drug Use and Health, American Indian/Alaska Natives (9%) and whites (4%) were more likely to use smokeless tobacco than African Americans (2%), Asians (1%), or Hispanic/Latinos (1%).²⁷
- Smokeless tobacco use varies regionally. In 2005, the Midwest (3.1%) and the South (2.9%) had a higher prevalence of the current use of chewing tobacco or snuff than the West (1.3%) and the Northwest (0.9%).

The tobacco industry continues to market new and existing products as supplemental sources of nicotine in smoke-free settings or misleadingly as a low-risk option for smokers who are unable to quit.³⁴⁻³⁶ Among

the new products being test-marketed by the tobacco industry in the US is a smokeless product called snus, a “spitless” low-nitrosamine moist powder tobacco pouch placed between the user’s cheek and gum.³⁷ Although such products are marketed as having lower risk, they may actually provide a gateway to smoking among nonsmokers, especially children, and increase overall tobacco use by encouraging dual-use of cigarettes and snus.^{38,39} They also may discourage use of evidence-based cessation therapies among those who want to quit. Given any of the above scenarios, the use of smokeless tobacco products may increase the risk of individual and population harm.³⁴ Therefore, it is important to advocate for regulation of 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 economic, policy, regulatory, educational, social, and clinical strategies.^{4,40} Interventions that effectively reduce tobacco use include increases in excise taxes, restrictions on smoking in public places, and effective anti-tobacco media campaigns.⁴⁰

The goals of comprehensive tobacco control include:⁴⁰

- 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.

In 2007, the Centers for Disease Control and Prevention updated its recommendations on *Best Practices for Comprehensive Tobacco Control Programs*.⁴ 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 and grassroots, voluntary, and civic organizations)

Table 1C. Current Cigarette Smoking*, Adults 18 and Older, by State, US, 2006

	% Both sexes	State rank [†]	% Men	% Women	% Low education [‡]
Alabama	23.3	43	26.3	20.6	33.2
Alaska	24.2	47	25.3	22.9	45.4
Arizona	18.1	14	21.7	14.7	25.9
Arkansas	23.7	45	25.9	21.7	36.9
California	14.9	2	18.5	11.4	18.4
Colorado	17.9	9	19.3	16.4	28.4
Connecticut	17.0	4	18.9	15.3	30.0
Delaware	21.7	35	23.3	20.2	43.4
Dist. of Columbia	17.9	10	21.4	14.9	37.5
Florida	21.0	31	23.6	18.7	24.3
Georgia	20.0	24	22.4	17.7	33.4
Hawaii	17.5	6	19.2	16.0	28.2
Idaho	16.8	3	18.7	15.0	29.0
Illinois	20.5	28	24.2	17.0	31.2
Indiana	24.1	46	26.3	21.9	37.0
Iowa	21.5	32	23.2	19.9	39.7
Kansas	20.0	25	22.2	18.0	28.2
Kentucky	28.6	51	29.1	28.1	41.9
Louisiana	23.4	44	26.6	20.5	29.7
Maine	20.9	30	21.8	20.0	33.4
Maryland	17.8	7	19.1	16.7	35.3
Massachusetts	17.8	8	19.4	16.4	28.5
Michigan	22.4	39	24.8	20.1	39.5
Minnesota	18.3	16	18.5	18.2	22.2
Mississippi	25.1	48	27.9	22.5	33.9
Missouri	23.3	42	24.7	22.1	39.2
Montana	19.0	20	18.5	19.6	39.5
Nebraska	18.6	18	19.6	17.7	23.1
Nevada	22.2	37	22.9	21.4	24.4
New Hampshire	18.7	19	19.3	18.2	41.2
New Jersey	18.1	13	20.8	15.6	23.3
New Mexico	20.2	26	22.6	17.8	26.6
New York	18.3	15	19.0	17.6	25.4
North Carolina	22.1	36	25.3	19.0	28.3
North Dakota	19.6	23	21.0	18.1	26.1
Ohio	22.5	40	24.9	20.2	40.8
Oklahoma	25.1	49	27.9	22.5	36.4
Oregon	18.5	17	19.7	17.2	29.5
Pennsylvania	21.5	33	22.3	20.8	34.4
Rhode Island	19.3	21	19.7	18.9	20.4
South Carolina	22.3	38	25.7	19.2	32.3
South Dakota	20.4	27	21.6	19.2	22.9
Tennessee	22.6	41	23.8	21.5	34.7
Texas	18.1	12	20.6	15.6	23.9
Utah	9.8	1	10.4	9.2	17.7
Vermont	18.0	11	19.4	16.7	36.7
Virginia	19.3	22	20.1	18.5	31.7
Washington	17.1	5	18.9	15.3	29.2
West Virginia	25.7	50	25.4	26.0	33.8
Wisconsin	20.8	29	23.4	18.3	31.8
Wyoming	21.6	34	23.8	19.4	38.8
United States [§]	19.7		21.9	17.7	27.7
Range	9.8-28.6		10.4-29.1	9.2-28.1	17.7-45.4

*Adults 18 and older who have smoked 100 cigarettes and are current smokers (everyday or someday). †Rank is based on % both sexes. ‡Adults 25 and older with less than a high school education. §See Statistical Notes for definition.

Source: Behavioral Risk Factor Surveillance System Public Use Data Tape 2006, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2007.

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- 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)

Evidence for these recommendations stems in part from states that have documented the benefits of implementing comprehensive tobacco control programs.⁴⁰⁻⁴⁴ The latest evidence for comprehensive tobacco control programs comes from Washington, Maine, and New York, which have experienced declines in smoking rates of 15%-25% among adults and 40%-65% among youth after implementing such programs.⁴⁵⁻⁴⁹ As a result of its long-standing comprehensive tobacco control program and increased excise taxes, 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 excise taxes but no comprehensive tobacco control programs or low excise taxes and no comprehensive tobacco control programs.^{50,51} These reductions in smoking have, in turn, 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.⁵² Additionally, mortality from smoking-attributable cancers has declined more rapidly in California than in the rest of the US.⁵³

The Institute of Medicine in 2007 recommended two overarching strategies to end the tobacco problem in the US.⁵⁴ The first was increased implementation of evidence-based tobacco control strategies, including comprehensive state tobacco control programs, tobacco

excise taxes, smoking restrictions, youth smoking prevention, cessation support, and community action. The second strategy recommended a stronger federal presence in tobacco control activities, including federal regulation of tobacco products and industry activities.

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%.⁴⁰ Young people who smoke are up to three times more responsive to price increases than adults.⁵⁵ Raising cigarette prices by increasing excise taxes reduces tobacco consumption, especially among children. It prevents tobacco use among adolescents and young adults and increases cessation among adults.³⁸ States with low excise taxes tend to have higher smoking prevalence and lung cancer rates. For example, six of the 10 states with the lowest excise tax are among the 10 states with the highest lung cancer rates in men (Kentucky, Mississippi, Tennessee, Louisiana, South Carolina, and Missouri). Increased excise taxes also raise governmental revenue that can be used for tobacco control.^{40,54}

- Cigarette taxes can be levied at the federal, state, local, and municipal levels. Currently, the federal excise tax is 39 cents per pack in all states, but there is wide variation in state cigarette excise taxes levied, ranging from 7 cents per pack in South Carolina to \$2.58 per pack in New Jersey (Table 1D).
- Currently, 25 states have a state excise tax less than \$1.00 per pack of cigarettes. These low-taxing states are mostly concentrated in the southeast and central US and include several tobacco-growing states (see cover, Table 1D).
- Although 43 states and the District of Columbia have increased their cigarette taxes since 2000, only 23 states have laws requiring that a portion of their excise taxes be dedicated to health, cancer control, or tobacco control programs.⁵⁶

Even though state excise taxes have risen in the past few decades, tobacco companies currently spend approximately \$11.5 billion on cigarette price discounts, promotional allowances to retailers or wholesalers, and other strategies to buffer price-sensitive smokers from the shock of price increases.^{57,58} Further increases in excise taxes and increased regulation of the tobacco industry are needed to counter these strategies. In parallel, policies should be developed to counter bootlegging and illegal sales of single cigarettes in

disadvantaged communities that negate the benefits of increased tobacco taxes.^{59,60}

Smoke-free Initiatives to Reduce Exposure to Secondhand Smoke

Smoke-free initiatives (also referred to as clean indoor air laws or ordinances) implemented at the state or local level are another important component of comprehensive tobacco control.¹³ Comprehensive statewide smoking bans reduce exposure to secondhand smoke. New York state, which implemented a smoking ban in workplaces, restaurants, and bars in 2003, saw a 47% reduction in exposure to secondhand smoke among nonsmokers, as measured by levels of cotinine, a metabolite of nicotine considered to be the best biomarker for measurement of secondhand smoke exposure.⁶¹ Comprehensive smoking bans are also effective at the local level. A recent study showed that the more comprehensive the smoke-free law, the greater the percentage of the population protected from exposure to secondhand smoke: 12.5% of adults in counties with extensive smoke-free coverage laws were exposed to secondhand smoke, compared to 35.1% in counties with limited smoke-free coverage and 45.9% in counties with no law.⁶²

Several studies have documented a positive health effect of smoke-free ordinances that have been associated with decreases in heart attacks, colds, sinus infections, and respiratory symptoms among restaurant and bar workers.⁶³⁻⁶⁶ A decrease of 80%-90% of fine particulate matter has been measured in the air of restaurants and bars following the implementation of smoke-free ordinances.^{67,68}

Smoking bans also change social norms about smoking and motivate smokers to reduce their consumption or quit completely.²¹ Recent research also indicates a relationship between smoke-free legislation and reduced adolescent smoking. One study demonstrated that local restaurant smoking bans reduced progression from occasional to established smoking among adolescents.⁶⁹ At the state level, stronger clean indoor air laws were related to lower levels of youth smoking.⁷⁰

Although opponents of smoke-free laws cite concerns about harms to businesses, particularly in the hospitality industry, numerous studies on the economic impact of smoke-free legislation on restaurants, bars, and other components of the hospitality industry have shown either no adverse effect or a positive effect on business.⁷¹ The gaming industry, including most tribally owned casinos and bars, is increasingly the only portion of the

hospitality industry exempted from smoke-free laws. However, a study in Delaware found that its comprehensive, statewide smoke-free law had no effect on revenue from the gaming industry.⁷² Additionally, in Massachusetts, charitable bingo has not been negatively affected by smoke-free ordinances.⁷³

Smoke-free legislation can be enacted at federal, state, and local levels:⁴⁰

- More than 2,791 municipalities have passed some form of local smoke-free legislation.⁷⁴ Currently, 277 municipalities in the country have passed local laws to establish 100% smoke-free workplaces, restaurants, and bars.⁷⁴
- Twenty nine states, the District of Columbia, and Puerto Rico have either implemented or enacted statewide smoking bans that prohibit smoking in workplaces, and/or restaurants, and/or bars.⁷⁴ Eighteen of these states/territories, including 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).⁷⁴ Several other states have had success enacting limited forms of smoke-free legislation.
- Reflecting the success of smoke-free legislation, currently 64.3% of the US population is covered by a 100% smoke-free provision in workplaces, and/or restaurants, and/or bars.⁷⁴
- However, in 14 states, tobacco industry lobbyists have persuaded the legislature to enact either partial or complete preemption laws that prohibit local governments from enacting smoke-free air laws.⁷⁵

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

Counter-advertising

Exposure and receptivity to tobacco industry advertising, marketing, and promotions significantly increase the likelihood that adolescents initiate tobacco use and ultimately become established users.⁷⁶⁻⁷⁸ Although direct and indirect tobacco marketing to children is prohibited by the 1998 Master Settlement Agreement (MSA), the tobacco industry continues to use marketing and promotion strategies that appeal to children, including marketing candy-flavored cigarettes,

Table 1D. Comprehensive Tobacco Control Measures, by State, US, 2008

	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		0.17	0.3
Alaska	2.00 [†]		11.96	6.8
Arizona	2.00 [†]	W, R, B	4.58	4.5
Arkansas	0.59 [†]		5.84	7.6
California	0.87	R, B	2.29	4.1
Colorado	0.84	R, B	6.04	7.9
Connecticut	2.00 [†]	R, B	0.00	0.0
Delaware	1.15	W, R, B	13.65	6.0
Dist. of Columbia	1.00	W, R, B	6.29	5.5
Florida	0.339	W, R	3.63	6.6
Georgia	0.37		0.27	0.6
Hawaii	2.00 [†]	W, R, B	8.58	6.8
Idaho	0.57	R	1.08	1.7
Illinois	0.98	W, R, B	0.68	0.9
Indiana	0.995 [†]		2.66	2.2
Iowa	1.36		4.20	3.4
Kansas	0.79 [†]		0.52	0.7
Kentucky	0.30		0.59	0.8
Louisiana	0.36 [†]	W, R	1.72	2.5
Maine	2.00 [†]	R, B	13.26	7.4
Maryland	2.00 [†]	W, R, B	3.47	3.4
Massachusetts	1.51	W, R, B	2.02	1.8
Michigan	2.00 [†]		0.36	0.3
Minnesota	1.49	W, R, B	4.49	3.5
Mississippi	0.18		2.81	4.3
Missouri	0.17		0.04	0.1
Montana	1.70 [†]	W, R, B	9.42	6.9
Nebraska	0.64	W, R, B	1.46	2.2
Nevada	0.80	W, R	1.00	1.1
New Hampshire	1.08 [†]	R, B	1.05	0.6
New Jersey	2.575 [†]	W, R, B	1.31	1.0
New Mexico	0.91	R, B	5.28	8.7
New York	1.50 [†]	W, R, B	4.51	4.8
North Carolina	0.35 [†]		2.12	4.0
North Dakota	0.44	W	4.83	5.2
Ohio	1.25	W, R, B	3.94	3.3
Oklahoma	1.03		4.12	3.3
Oregon	1.18	W, R, B	2.40	2.4
Pennsylvania	1.35 [†]		2.58	2.3
Rhode Island	2.46 [†]	W, R, B	0.90	0.5
South Carolina	0.07		0.50	1.7
South Dakota	1.53 [†]	W	6.62	5.0
Tennessee	0.62 [†]		1.76	2.0
Texas	1.41		0.57	0.6
Utah	0.695	W, R, B	3.27	7.7
Vermont	1.99 [†]	R, B	8.54	5.0
Virginia	0.30 [†]		2.05	4.5
Washington	2.025 [†]	W, R, B	4.60	4.4
West Virginia	0.55		3.15	3.0
Wisconsin	1.77 [†]		2.80	2.5
Wyoming	0.60		11.95	12.5
United States [¶]	1.12		3.76	2.90
Range	0.07-2.58		0.0-13.65	0.0-12.5

*Note: At the time of the publication of this report, tax increases in Hawaii (\$0.2) and Vermont (\$0.2), as reported here, were not yet in effect. [†]States that passed tax increases more than once or instituted multi-year increases in a law passed at the same time since 2000. [‡]Smoke-free laws passed or implemented, reported as of January 2, 2008. Note: W-workplaces, R-restaurants, B-bars. Note: At the time of publication of this report, smoke-free laws in Montana (B), Nebraska (W, R, B), Oregon (W, R, B) and Utah (B), as reported here, were not in effect. [§]Tobacco revenue is the projected collections from tobacco taxes and payments to states from the Master Settlement Agreement with the tobacco companies. [¶]See Statistical Notes for definition of average value (including District of Columbia) for taxes and per capita funding.

Source: Cigarette Taxes: Campaign for Tobacco-Free Kids, et al. Cigarette tax increases by state per year, 2000-2008. National Center for Tobacco-Free Kids, 2007. 100% Smoke-free laws: American Nonsmokers' Rights Foundation. Overview List-How Many Smokefree Laws? 2008. Tobacco control Funding & Tobacco control funding as a % of tobacco revenue: A Broken Promise to Our Children: the 1998 Master Settlement Agreement Nine Years Later. National Center for Tobacco-Free Kids, 2007. Per capita funding is calculated by dividing state prevention funding by 2000 US Census state population counts (<http://www.census.gov>).

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discounting cigarettes, and sponsoring music and sporting events.^{57,79,80}

Effective counter-advertising media campaigns aggressively use media advocacy and paid advertisements to discourage tobacco use and expose the industry's deceptive marketing and promotional tactics.^{40,81} In developing its "truth" campaign, the Florida Governor's Office worked with teen advisors to develop a media campaign that countered the image perception of smoking as cool and rebellious. In California, the statewide media campaign promotes core messages (e.g., "the tobacco industry lies," "secondhand smoke kills," and "nicotine is addictive") to foster a social and legal climate in which tobacco use is recognized as undesirable and non-normative.⁸²

Antismoking media campaigns are effective in reducing smoking initiation in early adolescence.⁸³ The nationwide youth antismoking "truth" media campaign accounted for approximately 22% of the decline in youth smoking prevalence between 1999-2002.⁸⁹ Florida's "truth" campaign produced a 40% reduction in smoking prevalence among middle school students from 1998 to 2000.^{84,85} States that have combined extensive paid media campaigns with other anti-tobacco activities have seen rapid declines in youth and adult smoking prevalence.⁸⁴ In 2005, after experiencing a stall after four years of significant declines in smoking rates as a result of a comprehensive tobacco control program, New York City implemented an extensive antismoking media campaign that resulted in a further decline in smoking rates among males and Hispanics.⁸⁶

Tobacco companies, on the other hand, have blocked the creation of several media campaigns, subverted effective media messages, and even initiated lawsuits against the California campaign and the "truth" campaign.^{81,87} In addition, they have launched their own media campaigns that purport to discourage youth smoking and help adult smokers quit. Recent research has shown, however, that the industry advertisements are not effective in deterring youth smoking, and those which target parents may actually encourage youth smoking.⁸⁸

Tobacco Cessation

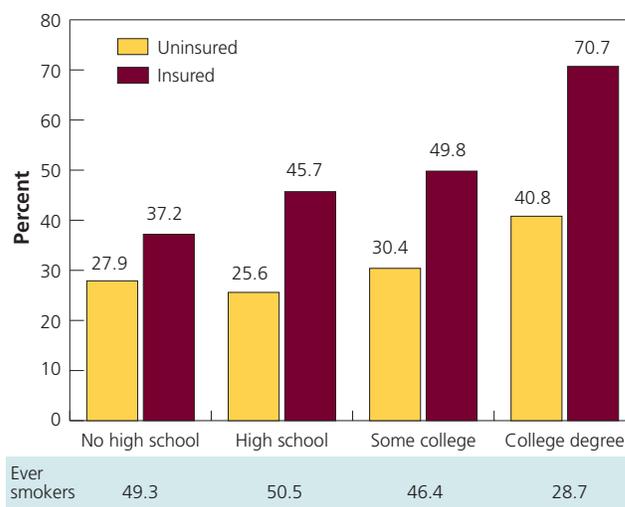
Youth Tobacco Cessation

Encouragement and support in quitting smoking is important for adolescent smokers for several reasons. The opportunity to prevent diseases caused by smoking is greatest when smokers quit early.¹⁵ Adolescents often underestimate the strength and rapidity of tobacco dependence, with one recent study showing that

adolescents can exhibit tobacco dependence symptoms even before they begin daily smoking.^{6,7} Adolescents generally overestimate their ability to quit smoking. One study of 12th-grade daily smokers found only 3% thought that they would "definitely" be smoking in five years, yet seven to nine years later, more than 60% of them were still smoking.⁹⁰

Most young smokers want to quit smoking and have tried to quit.¹⁶ In 2004, about 58% of current high school smokers reported having made an attempt to quit in the preceding 12 months. However, just 29.2% of these students were successful at staying off cigarettes for more than a month. These data highlight the importance of providing children and adolescent smokers with appropriate resources and support to successfully quit (see sidebar, page 13).

Figure 1D. Percent of Ever Smokers Who Are Former Smokers*, by Education† and Insurance Status‡, Adults 25-64 Years, US, 2006



*Ever smokers smoked at least 100 cigarettes in their lifetime. Former smokers are ever smokers who said they did not smoke now at all. †Respondents with a high school degree included those with a General Educational Development Diploma. ‡The uninsured are those who did not report having health insurance at the time of the interview.

Source: National Health Interview Survey Public Use Data File, 2006, National Center for Health Statistics, Centers for Disease Control and Prevention, 2007.

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Adult Tobacco Cessation

Much of the risk of premature death from smoking could be prevented by smoking cessation. One study showed that those who quit smoking at age 60, 50, 40, or 30 gained, respectively, about three, six, nine, or 10 years of life expectancy.⁹² Of the 45.3 million Americans who

smoke, more than 44.2% report having attempted to quit for at least one day in the past year.²³

Among adults who ever smoked, those who currently have health insurance are much more likely to have quit smoking, regardless of level of education (Figure 1D). This association is likely because of insured smokers' greater access to and use of effective smoking cessation treatments, which have been shown to at least double the chances of successful smoking cessation.⁹³⁻⁹⁵ Effective cessation aids include nicotine replacement products or prescription medication in combination with counseling or behavioral therapies.⁹³ Nationally, the use of cessation aids in quit attempts remains low; only 22% of smokers trying to quit used cessation aids. This proportion was even lower among uninsured smokers (13%).^{96,97} One barrier is cost.⁹⁸ Even insured smokers may bear a significant portion of the cost of pharmacotherapy because of deductibles and co-payments or, in some cases, because of non-coverage.^{98,99} In some cases, coverage is extended only to certain groups of smokers; e.g., Medicare covers smoking cessation counseling and pharmacotherapy (excluding over-the-counter treatment) only for seniors with illnesses caused or complicated by tobacco use, and some state Medicaid programs cover treatments only for pregnant women.^{100,101}

- Among national surveys to assess health insurance coverage of any tobacco cessation treatments, estimates range from 96% among health maintenance plans to 20% among employer-provided plans.^{94,102,103}
- In 2006, Medicaid programs in 38 states and the District of Columbia covered one or more treatments for tobacco dependence (medication or counseling) for all recipients.¹⁰¹ Only Oregon offered full coverage of all US Public Health Service (USPHS) recommended medication and counseling treatments. Seven other states offered coverage for all recommended medications and at least one form of counseling.
- In 2003, 17 states (out of 45 states surveyed) ensured that state employees had access to health insurance coverage for pharmacotherapy and counseling.¹⁰⁴

Health care providers can be especially effective in delivering cessation services. The US Public Health Service recommends that clinicians follow the "5 A" model in treating smokers who are willing to quit: Ask a patient about their smoking status; advise to quit; assess for willingness to quit; assist in quitting; and arrange for a follow-up visit. Other strategies that may increase the use of cessation services by patients in health care

Youth Cessation Resource

The Youth Tobacco Cessation Collaborative, a coalition of 10 public, private, and voluntary health organizations, including the American Cancer Society, was formed in 1998 to review effective strategies to aid cessation among youth. *Youth Tobacco Cessation: A Guide for Making Informed Decisions*, a document developed as a result of this review, is a useful resource to guide health professionals, policy makers, and researchers through the process of developing, implementing, and evaluating a youth tobacco cessation program. More information can be found at <http://www.youthtobacco cessation.org/index.html> or at http://www.cdc.gov/tobacco/quit_smoking/cessation/YouthTobacco.htm

systems include dedicating staff specifically for this purpose and institutionalizing cessation services, e.g., by providing mandatory counseling for tobacco users before discharge.³⁸

Another strategy to facilitate cessation is the implementation of statewide cessation telephone counseling. These toll-free services can deliver effective behavioral counseling to large numbers of tobacco users, including low-income, rural, elderly, uninsured, and racial/ethnic subpopulations of smokers.⁹³ A recent study showed that smokers who received telephone counseling (and mailing of smoking cessation medications, if indicated) were more likely to have used smoking cessation treatments and stopped smoking for at least six months, compared to those who received just routine health care and mailed self-help materials.¹⁰⁵ In addition to a national service (1-800-QUITNOW), as of 2007, all 50 states, the District of Columbia, and five territories offered some degree of telephone cessation counseling.^{4,94}

The American Cancer Society Quitline[®] program (1-877-YES-QUIT, 1-877-937-7848) has offered free telephone-based cessation services since 2000 and has become the top provider of services, with contracts in 11 states representing 27% of the US population. In addition, American Cancer Society Quitline services are available to more than 40 employers and health plans nationwide. For three decades, the Society has designated the third Thursday in November as the Great American Smokeout[®], a day for smokers nationwide to give up their cigarettes for at least a day in the hope they might stop smoking. (For more information, refer to www.cancer.org/docroot/PED/PED_10_4_Great_American_Smokeout.asp or call 1-800-ACS-2345.) In addition, a US Department of Health and Human Services Web site (<http://www.smokefree.gov>) offers online advice and downloadable information on quitting.

Funding for Tobacco Control

Since the Master Settlement Agreement with the states, tobacco companies have increased their cigarette advertising and promotional expenditures by 95%, from \$6.7 billion in 1998 to \$13.1 billion in 2005, and even higher in the intervening years.⁵⁷ 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 2005, for every dollar spent in the US on tobacco control efforts, the industry spent about \$24 to promote its products, up from a \$14-to-\$1 ratio in 2000 (Figure 1E).

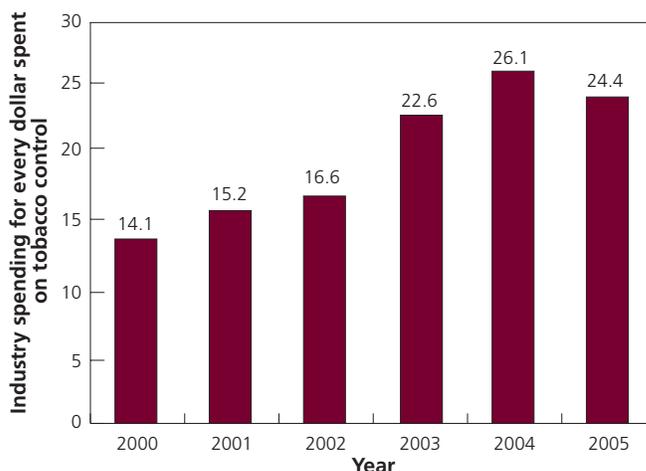
Recent research indicates that increased spending on tobacco control by states is associated with lower youth smoking prevalence and fewer cigarettes smoked.⁴³ However, several of the most effective comprehensive tobacco control programs in the nation have now been jeopardized by severe budget cuts as a result of state budget deficits and other political pressures.^{106,107} States that have experienced funding cuts have seen increases in adolescent susceptibility to smoking and increases in the illegal sales of tobacco products to minors.¹⁰⁸⁻¹¹⁰

One of the leading recommendations of the 2007 Institute of Medicine report on ending the tobacco problem in the US supported the creation and sustenance of state-level comprehensive tobacco control programs funded at levels recommended by the CDC and commensurate with the state's population, demography, and tobacco use prevalence.⁵⁴ First published in 1999 and updated in 2007, 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.⁴ Funding all state tobacco control programs at these updated levels recommended by the CDC for five years would result in an estimated 5 million fewer smokers in the US.⁴

This report will compare 2008 state funding levels to CDC-recommended funding levels from 1999. Future *Cancer Prevention & Early Detection* reports will compare state funding levels to updated CDC recommendations from 2007.

- In 2008, states allocated a total of \$717.2 million for tobacco control programs, the highest level in six years. Twenty-nine states increased their per capita funding levels from 2007 to 2008, 14 of them by more than \$1.
- However, the total amount allocated in 2008 constitutes just 45% of the 1999 CDC recommendation for the minimum level of tobacco control funding. Only

Figure 1E. Ratio of Tobacco Industry Marketing Dollars* to Tobacco Control Dollars Spent†, US, 2000-2005



*Marketing includes advertising and promotional expenditures. †Some tobacco control funding totals based on estimates calculated by the Campaign for Tobacco-Free Kids. ‡Tobacco control funding is by fiscal year.

Source: Marketing expenditures: Federal Trade Commission, Federal Trade Commission Cigarette Report for 2004 & 2005, Washington, DC, 2007. Tobacco Prevention Funding: Campaign for Tobacco-Free Kids. A Broken Promise to Our Children. The 1998 Master Settlement Agreement Nine Years Later. Washington, DC, 2007.

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three states met or exceeded their recommended levels: Colorado, Delaware, and Maine. Seventeen other states fund tobacco control programs at at least half their minimum recommended levels, while the remaining 30 states and the District of Columbia fund at less than half their minimum recommended amount (Figure 1F).¹¹¹

- In 2008, states' revenue from tobacco taxes and the MSA with the tobacco companies is projected to be \$24.9 billion.¹¹¹ However, only 2.9% of this amount has been allocated for tobacco control funding. While Connecticut allocated none of its revenue to tobacco control, Wyoming allocated the most (12%) among all states (Table 1D).

Other Youth Tobacco Control Strategies

School-based tobacco prevention programs can be effective as part of comprehensive tobacco control programs. The surgeon general recommends that tobacco prevention programs begin by sixth grade.⁴⁰ Because the long-term consequences of smoking seem remote to adolescent smokers, smoking prevention materials geared toward youth should focus on the short-term as well as the long-term consequences of smoking, such as reduced athletic performance and

Overweight and Obesity, Physical Activity, and Nutrition



Obesity, physical inactivity, and poor nutrition are major risk factors for cancer, second only to tobacco use.¹²⁰ Approximately one-third (188,550) of the 565,650 cancer deaths in the US this year can be attributed to poor diet, physical inactivity, overweight, and obesity. Although genetic inheritance plays a role for some individuals in the risk of developing cancer, modifiable behaviors have a larger impact on cancer risk for the population as a whole. Avoiding tobacco products, maintaining a healthy weight, staying physically active throughout life, and consuming a healthy diet can substantially reduce one's lifetime risk of developing cancer (as well as cardiovascular disease).¹²¹

Based upon a comprehensive review of current evidence, the American Cancer Society has updated guidelines on nutrition and physical activity for cancer prevention. These guidelines contain recommendations regarding community actions and individual choices related to weight control, physical activity, and diet.

Community Action

Community efforts to create a physical and social environment that promotes healthy food choices and physical activity are important in facilitating healthy individual choices.

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. Employers can implement worksite health promotion programs. Schools can ensure that students participate in physical activity and promote the availability of healthy food and beverages. Health care professionals can advise and assist their patients on effective weight loss programs. At the state and local levels, community leaders, in particular, can promote policy changes that may include regulation of food served in schools, zoning changes and tax incentives that bring food stores into poor neighborhoods, and the creation of safe spaces for physical activity. The following are some specific approaches that have been proposed^{122,123} (see sidebar).

The Society continues to work in collaboration with many organizations, including the American Heart Association, the American Diabetes Association, and the

Approaches to Improving Physical Activity and Nutrition

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

This section provides a summary of the 2006 *American Cancer Society Guidelines on Nutrition and Physical Activity*, along with the most recent population statistics. The complete guidelines article has been published in *CA: A Cancer Journal for Clinicians* 2006; 56(5):254-281 and can be downloaded for free from this link: <http://caonline.amcancersoc.org/cgi/content/full/56/5/254>.

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

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.

Centers for Disease Control and Prevention to identify and disseminate effective public health strategies to address the epidemic of overweight and obesity.

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).

1. *Maintain a Healthy Weight Throughout Life.*

- Balance caloric intake with physical activity.
- Avoid excessive weight gain throughout life.
- 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% to 20% of all cancer-related deaths (for definitions of

overweight and obesity, see sidebar, page 19). Overweight and obesity are clearly associated with increased risk for developing many cancers, including cancer of the breast (postmenopausal), colon, endometrium, esophagus, and kidney. It is also believed that obesity increases the risk for cancers of the pancreas, gall bladder, thyroid, ovary, and cervix, and for multiple myeloma, Hodgkin disease, and aggressive prostate cancer. The link between body weight and cancer risk is believed to stem from multiple effects on fat and sugar metabolism, immune function, hormone level (including insulin and estradiol), and cell growth. Recent studies suggest 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. Although knowledge about the relationship between weight loss and cancer risk is still limited, individuals who are overweight or obese should be encouraged and supported in their efforts to reduce weight.

Current Levels and Trends in Overweight and Obesity

- Approximately two-thirds of Americans are overweight or obese.¹²⁴
- In the past 20 years, overweight prevalence among adolescents aged 12 to 19 more than tripled, from 5% to 17.1%. Increases have occurred across race, ethnicity, and gender; Non-Hispanic African American girls have the highest rates of overweight (Figure 2A).
- The percentage of US adolescents who were at risk of becoming overweight in a subset of states in 2005 ranged from 10.3% to 17.8%. (Table 2A provides additional overweight measures in certain cities.)
- The percent of obese adults aged 20 to 74 years varied little from 1960-1962 to 1976-1980. In contrast, obesity rates more than doubled between 1976-1980 and 2003-2004, from 15.1% to 33.0%. In 2005-2006, obesity prevalence in men (34.0%) and women (36.4%) did not significantly change from that in 2003-2004 (Figure 2B).
- In 2006, the prevalence of obesity across states ranged from 18.3% in Colorado to 31.5% in Mississippi (Table 2B).

For most people, weight gain results from a combination of excessive caloric intake and inadequate physical activity. While science continues to investigate the

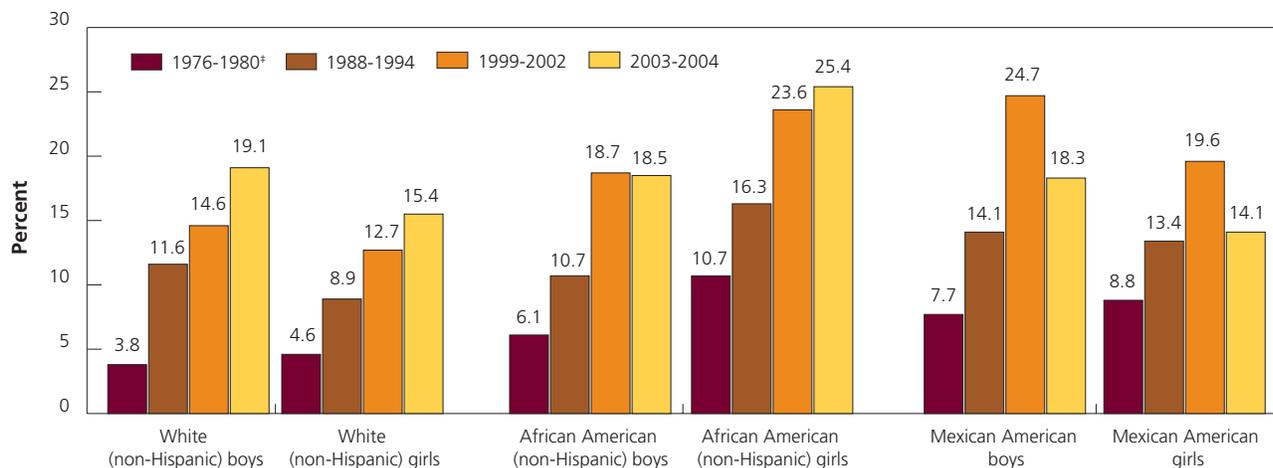


specific relationship between body weight, physical activity, and cancer, there is no debate that overweight and obesity represent a serious and growing health problem in the US.

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 is calculated as weight in kilograms divided by height in meters squared, see

Figure 2A. Overweight* Children and Adolescents 12-19 Years, by Gender & Race/Ethnicity†, US, 1976-2004



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

Source: National Health and Nutrition Examination Survey, Hispanic Health and Nutrition Examination Survey (1982-84). Centers for Disease Control and Prevention, National Center for Health Statistics, Health, United States, 2004, with Chartbook on Trends in the Health of Americans. Hyattsville, Maryland: 2004. Ogden CL, et al. Prevalence of Overweight and Obesity in the United States, 1999-2004. *JAMA* 2006;295(13):1549-55.

American Cancer Society, Surveillance Research

sidebar). Cutoffs established by the World Health Organization define the healthy range of BMI to be 18.5 to 24.9 kg/m². The range of 25.0 to 29.9 is considered overweight, and a BMI of 30.0 or higher is obese.

The best way to achieve and maintain a healthy body weight is to balance caloric intake with physical activity.^{120,125} For individuals who are overweight, limiting consumption of foods and beverages high in calories, fat, and added sugars, as well as limiting alcohol intake, can help reduce caloric intake. Eating smaller portions will also help (see sidebar, page 21). High-calorie and low-nutrient foods should be replaced with vegetables, fruits, whole grains, beans, and lower-calorie beverages. Monitoring food intake and physical activity has been shown to be effective in weight management.

It should also be noted that healthy behavioral patterns are 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.¹²⁶ Unhealthy dietary patterns, physical inactivity, and excessive weight gain that begin during childhood often continue into adulthood, increasing the risk of developing cancer, cardiovascular disease, diabetes, hypertension, and osteoporosis.

Defining Body Mass Index

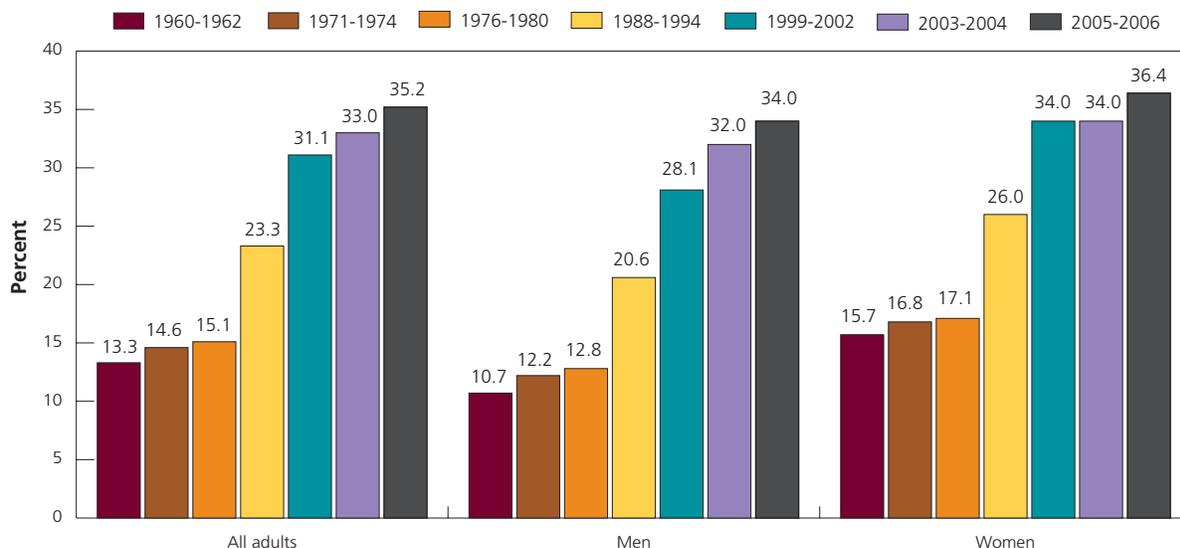
This sidebar relates BMI to pounds and inches. For example, a 5'4" woman is considered overweight if she weighs between 145 and 173 pounds. She is obese if she weighs 174 pounds or more. A 5'10" man is considered overweight if he weighs between 174 and 206 pounds and obese if he weighs 207 pounds or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

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

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

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

Figure 2B. Adult Obesity*, Ages 20-74, by Gender, US, 1960-2006†



*Body mass index of 30 kg/m² or greater. †Age adjusted to the 2000 US standard population.

Source: National Health and Nutrition Examination Survey, Hispanic Health and Nutrition Examination Survey (1982-84). Centers for Disease Control and Prevention, National Center for Health Statistics, Health, United States, 2004, With Chartbook on Trends in the Health of Americans. Hyattsville, Maryland: 2004. 2003-2004, 2005-2006: National Health and Nutrition Examination Survey Public Use Data Files, 2003-2004, 2005-2006, National Center for Health Statistics, Centers for Disease Control and Prevention, 2006, 2007.

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Table 2A. Overweight and Related Factors, High School Students, by State and City/County, US, 2005

	% At risk for becoming overweight*	% Overweight [†]	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	15.7	13.1		37.2	35.8	33.0	56.0	20.1
Alabama	17.8	14.8	35	38.4	31.8	45.1	55.9	14.7
Arizona	13.6	11.9	18	32.8	32.3	26.2	47.1	15.2
Arkansas	16.7	15.4	38	39.1	30.9	27.2	50.8	13.9
Colorado	10.3	9.8	6	26.8	37.2	16.6	61.2	19.2
Connecticut	14.7	11.2	13	33.5	N/A	12.9	N/A	21.8
Delaware	15.1	14.1	32	44.6	N/A	30.1	56.0	16.3
Florida	14.4	10.9	10	40.9	30.6	25.3	50.8	21.9
Georgia	14.9	12.4	23	42.4	33.9	35.9	55.9	18.1
Hawaii	14.2	13.5	28	36.9	30.2	12.1	N/A	19.1
Idaho	13.7	7.2	2	21.7	39.2	28.8	62.1	18.1
Indiana	14.3	15.0	36	31.9	32.2	28.2	58.8	15.5
Iowa	14.8	12.2	22	28.6	34.1	10.3	66.9	16.6
Kansas	13.3	11.9	19	28.8	41.3	27.8	64.4	20.6
Kentucky	17.0	15.6	39	35.5	29.6	17.3	52.6	17.1
Maine	14.4	10.9	11	26.8	N/A	6.7	59.8	18.9
Maryland	16.1	12.6	24	40.7	32.4	19.1	52.3	19.9
Massachusetts	15.6	11.2	14	32.8	N/A	17.9	54.5	N/A
Michigan	13.5	12.1	21	35.8	N/A	29.8	N/A	16.7
Missouri	15.9	13.9	30	33.9	36.0	31.1	56.9	16.7
Montana	12.8	9.3	4	26.3	31.2	34.0	61.7	17.0
Nebraska	13.8	11.0	12	26.5	36.5	34.3	63.3	13.5
Nevada	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
New Hampshire	13.2	11.4	16	24.5	42.8	N/A	57.6	N/A
New Jersey	15.4	11.4	17	35.8	34.0	60.7	61.8	16.8
New Mexico	14.6	12.0	20	28.6	N/A	24.3	N/A	17.8
New York	17.1	10.5	9	41.9	29.6	17.4	57.5	21.7
North Carolina	15.7	13.5	29	36.3	45.9	34.4	N/A	N/A
North Dakota	12.8	11.2	15	24.4	N/A	37.0	61.3	13.8
Ohio	14.7	12.7	25	36.4	N/A	N/A	58.1	N/A
Oklahoma	15.9	15.2	37	38.8	38.2	31.3	56.6	15.9
Rhode Island	15.2	12.9	27	36.0	32.2	19.8	53.6	25.4
South Carolina	13.7	12.7	26	41.4	29.8	21.8	52.0	16.2
South Dakota	14.0	10.4	8	24.1	32.3	21.5	59.1	16.8
Tennessee	17.5	14.6	34	41.4	33.7	29.7	50.8	18.0
Texas	15.0	13.9	31	40.5	36.0	35.7	57.6	19.4
Utah	11.1	5.6	1	19.0	35.6	22.6	59.6	20.0
Vermont	13.8	9.5	5	N/A	N/A	12.8	N/A	23.8
West Virginia	16.0	14.5	33	38.5	37.3	31.7	51.9	22.1
Wisconsin	13.7	9.9	7	26.1	35.0	60.2	N/A	N/A
Wyoming	12.3	8.4	3	22.3	36.0	21.5	59.5	16.8
Baltimore, MD	19.4	17.6	19	60.3	25.1	18.7	44.3	21.6
Boston, MA	18.7	15.4	12	45.4	N/A	9.0	46.2	N/A
Broward County, FL	16.2	11.9	8	45.7	28.3	22.9	47.9	22.9
Charlotte-Mecklenburg, NC	14.6	10.6	3	40.6	38.5	4.0	N/A	N/A
Chicago, IL	18.5	15.7	13	47.6	25.1	45.9	50.2	22.1
Dallas, TX	16.9	21.5	21	58.1	N/A	29.3	N/A	16.4
Dekalb County, GA	17.3	12.4	10	52.0	30.8	30.9	56.3	19.1
Detroit, MI	19.4	18.9	20	70.5	N/A	31.9	N/A	20.0
District of Columbia	20.7	10.6	4	61.9	18.2	16.3	44.8	19.6
Hillsborough County, FL	16.5	11.1	5	39.2	29.2	22.3	50.8	16.9
Los Angeles, CA	17.7	16.4	16	48.3	31.8	50.6	50.8	28.4
Memphis, TN	18.0	16.1	15	61.3	26.4	27.7	45.9	17.9
Miami-Dade County, FL	16.6	12.1	9	50.8	26.9	17.9	45.7	23.0
Milwaukee, WI	18.0	17.2	18	52.3	24.4	46.6	N/A	N/A
New Orleans, LA	17.6	15.9	14	55.0	19.2	26.5	45.1	19.9
New York City, NY	16.4	11.6	6	54.6	27.1	43.0	42.5	18.8
Orange County, FL	14.9	11.8	7	42.9	30.0	24.5	46.1	21.6
Palm Beach County, FL	14.2	10.4	1	40.3	27.4	27.0	48.1	26.4
San Bernardino, CA	19.7	16.4	17	46.4	30.3	47.5	48.7	19.5
San Diego, CA	14.3	12.7	11	40.8	N/A	40.5	53.3	18.7
San Francisco, CA	13.3	10.5	2	41.5	24.5	36.4	42.8	19.9

*Body mass index at or above the 85th percentile but below the 95th percentile of growth chart for age and sex. †Body mass index at or above the 95th percentile of growth chart for age and sex. ‡Rank is based on % overweight. §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 seven 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, 2005, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention. *MMWR Surveill Summ.* 2006;55(5):1-108.

What Counts as a Serving

Fruits: 1 medium apple, banana, or orange; 1/2 cup of chopped, cooked, or canned fruit; 1/4 cup of dried fruit; 1/2 cup of 100% fruit juice

Vegetables: 1 cup of raw leafy vegetables; 1/2 cup of other cooked or raw vegetables, chopped; 1/2 cup of 100% vegetable juice

Grains: 1 slice of bread, 1 ounce of ready-to-eat cereal; 1/2 cup of cooked cereal, rice, or pasta

Beans and nuts: 1/2 cup of cooked dry beans; 2 tablespoons of peanut butter; 1/3 cup of nuts

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

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



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 five 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.¹²⁰ A physically active lifestyle also reduces the risk of other chronic diseases, such as heart disease, diabetes, osteoporosis, and hypertension.¹²⁷

Types of Activity and Recommendations

Usual physical activity during one's daily routine is typically of low intensity and short duration. Intentional 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. (See sidebar on page 23 for selected examples of moderate and vigorous activities.)

Although the optimal intensity, duration, and frequency of physical activity needed to reduce cancer risk are unknown, 45-60 minutes on five or more days of the week has been proposed based on studies of colon and breast cancer.¹²⁰ Other studies have shown that one hour of exercise on five or more days each week helps to prevent weight gain and obesity.^{125,128} 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 by helping 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 five 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 vigorous physical activity. Stretching and warm-up periods before and after activity can reduce the risk of musculoskeletal injuries and muscle soreness.

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 2005, 35.8% of US youth were physically active for at least 60 minutes on more than five days per week,

Table 2B. Overweight, Obesity, and Related Factors, Adults 18 and Older, by State, US, 2005, 2006

	2006					2005				
	% 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)	State rank*	% No leisure-time physical activity	% Vigorous physical activity [†]	% Moderate physical activity [‡]	% Eating five fruit and vegetable servings a day	% Eating three or more vegetable servings a day	% Eating two or more fruit servings a day
Alabama	34.4	30.5	64.9	46	29.1	20.3	42.8	20.1	13.7	7.9
Alaska	37.9	26.3	64.2	42	21.5	36.0	59.2	24.6	8.1	18.5
Arizona	36.7	22.9	59.7	13	22.4	29.1	53.6	23.7	8.9	14.9
Arkansas	36.9	27.0	63.9	39	28.8	24.8	46.4	20.9	14.7	11.3
California	35.5	23.3	58.8	8	23.0	36.2	53.4	28.9	10.3	26.7
Colorado	36.7	18.3	55.0	3	17.3	32.6	54.4	24.3	9.0	19.7
Connecticut	38.2	20.6	58.8	9	19.8	31.1	51.4	27.5	10.0	17.6
Delaware	37.9	26.0	63.9	37	21.6	25.0	45.3	21.2	9.4	10.9
Dist. of Columbia	31.9	22.7	54.5	1	22.0	31.3	53.0	32.2	13.7	19.5
Florida	36.5	23.1	59.5	11	25.1	24.7	45.2	26.1	8.0	16.9
Georgia	34.6	27.2	61.8	25	24.7	23.7	42.0	23.2	15.0	12.6
Hawaii	35.5	20.5	56.0	5	19.3	30.4	52.2	24.4	8.4	13.9
Idaho	35.7	24.1	59.8	15	20.7	31.2	54.1	23.3	8.8	16.5
Illinois	36.6	25.1	61.7	24	22.4	25.7	47.1	24.0	7.3	17.8
Indiana	35.1	27.8	62.8	30	25.3	27.1	47.7	22.0	9.6	14.8
Iowa	37.3	25.7	63.0	32	22.3	22.9	46.2	19.5	6.8	13.4
Kansas	36.4	25.9	62.3	27	22.6	25.0	48.6	19.9	8.7	10.4
Kentucky	38.4	28.0	66.4	49	30.3	16.8	34.7	16.8	13.8	3.2
Louisiana	35.9	27.2	63.1	33	31.1	20.7	38.4	20.2	11.8	7.9
Maine	36.6	23.1	59.7	12	20.8	30.8	54.1	28.6	12.9	16.2
Maryland	35.7	25.0	60.7	17	23.0	29.6	49.2	28.8	13.0	18.1
Massachusetts	35.2	20.3	55.5	4	21.2	29.6	52.7	28.5	10.9	18.5
Michigan	36.0	28.8	64.8	45	22.8	28.1	49.6	22.8	7.4	17.5
Minnesota	38.0	24.7	62.7	29	14.2	28.3	51.0	24.5	6.9	21.0
Mississippi	35.2	31.5	66.7	50	31.2	20.9	40.0	16.5	10.9	8.7
Missouri	35.9	27.3	63.2	34	23.2	25.4	46.4	22.6	9.3	16.1
Montana	38.1	21.3	59.4	10	19.4	33.1	56.4	24.5	8.4	14.8
Nebraska	37.0	26.9	63.9	38	21.0	24.7	47.3	20.2	7.7	13.5
Nevada	38.6	25.0	63.6	36	27.1	32.6	50.6	22.5	4.3	17.9
New Hampshire	38.3	22.4	60.7	19	19.6	32.9	56.0	29.1	12.9	18.7
New Jersey	37.4	22.7	60.1	16	27.0	25.5	46.0	25.8	8.0	16.6
New Mexico	36.8	22.9	59.7	14	22.6	28.9	50.9	21.5	9.0	13.9
New York	35.4	23.0	58.5	7	26.0	27.4	48.1	25.9	8.1	19.6
North Carolina	36.2	26.7	62.9	31	23.9	22.2	42.1	22.5	15.9	7.7
North Dakota	39.1	25.4	64.5	43	22.0	27.6	48.4	21.9	7.3	15.7
Ohio	35.5	28.4	63.9	40	24.5	27.3	49.3	22.6	8.1	14.7
Oklahoma	35.9	28.8	64.7	44	29.8	22.6	42.3	15.7	7.5	7.8
Oregon	35.9	24.8	60.7	20	16.4	30.7	56.4	25.9	10.1	20.7
Pennsylvania	37.2	24.1	61.4	23	23.0	27.5	48.7	23.9	8.6	17.9
Rhode Island	39.8	21.4	61.1	21	24.8	29.8	51.1	26.7	9.2	17.0
South Carolina	36.1	29.4	65.5	48	24.3	24.6	45.2	21.0	11.0	11.8
South Dakota	38.7	25.6	64.2	41	24.0	23.5	47.6	20.6	5.1	14.4
Tennessee	36.4	28.9	65.3	47	28.7	17.4	36.2	26.6	18.4	5.9
Texas	36.2	26.2	62.4	28	28.3	25.3	46.7	22.6	11.1	13.8
Utah	33.0	21.9	54.9	2	19.4	34.2	55.0	22.1	8.6	18.8
Vermont	34.8	21.3	56.1	6	17.9	33.0	57.8	30.6	11.7	21.2
Virginia	36.8	25.1	61.9	26	21.7	30.4	50.8	26.2	13.2	18.8
Washington	36.5	24.2	60.7	18	17.3	30.6	54.7	25.2	9.8	20.2
West Virginia	36.0	31.1	67.0	51	25.6	17.6	39.4	20.0	13.4	6.9
Wisconsin	36.8	26.6	63.5	35	19.4	32.9	56.6	22.1	6.7	18.7
Wyoming	38.0	23.3	61.3	22	21.8	33.1	56.2	21.8	7.4	14.5
United States [§]	36.2	25.1	61.3		23.9	27.6	48.3	24.3	10.0	16.7
Range	31.9-39.8	18.3-31.5	54.5-67.0		14.2-31.2	16.8-36.2	34.7-59.2	15.7-32.2	4.3-18.4	3.2-26.7

*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 2005, 2006, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2006, 2007.

American Cancer Society, Surveillance Research

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, golf, 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)

and 33% attended physical education classes daily (Table 2A).

- In 2005, 37.2% of US high school students reported watching three or more hours of television per day (Table 2A).

Current Physical Activity Level in Adults

- In 2006, 23.9% of adults reported no leisure-time physical activity. The percentage of adults reporting no leisure-time physical activity ranged from 14.2% in Minnesota to 31.2% in Mississippi (Table 2B).
- In 2005, 48.3% of adults reported engaging in moderate levels of activity and 27.6% in vigorous levels of physical activity per day (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. Children and adolescents should be encouraged to be physically active at moderate to vigorous intensities for at least 60 minutes per day on five or more days per week.^{123,129} The availability of routine, high-quality physical education programs is a critically important and recognized way of increasing physical activity among youth. Daily physical education and activities should be provided for children at school and sedentary activities (eg, 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, and regular sodas.

- When you eat away from home, choose foods low in calories, fat, and sugar, and avoid large portion sizes.

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

- Include vegetables and fruits with every meal and as 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 instead of 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. For example, it is not completely understood how single or combined foods or nutrients affect one's risk of specific cancers. It has been shown that diets that are very low in vegetables, fruits, and whole grains, and high in processed and red meats are linked to an increased risk of some of the most common types of cancers. However, 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.

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. Consuming a varied diet that emphasizes plant foods may help to displace these calorie-dense foods. Limiting portion sizes, 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 amount 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.¹³⁰ 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.^{125,131} However, intake of these foods remains low among American adults and children, perhaps due to lack of access to affordable produce, preparation time, and taste preferences. Recommendations for cancer risk reduction are to consume at least five 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*.¹²⁵

Current Prevalence of Consuming Vegetables and Fruits in Adults and Adolescents

- About one in five (20.1%) US high school students ate vegetables and fruits five or more times per day in 2005 (Table 2A).
- Only 24.3% of adults reported eating five or more servings of vegetables and fruit daily in 2005. Across states, prevalence of consuming five or more servings of vegetables and fruit ranged from 15.7% in Oklahoma to 32.2% 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.¹²⁵ 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.¹²⁵

Processed and Red Meats

Several 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. 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. Meat also contains several constituents that could increase the risk of cancer, such as mutagens and carcinogens, iron, nitrates/nitrites, and salt.

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). Care should be taken to cook meat thoroughly to destroy harmful bacteria and parasites, while avoiding charring that can produce carcinogens. Legumes are especially rich in nutrients that may protect against cancer and 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.¹²⁵ 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.^{121,132} For each of these cancers, risk increases substantially with intake of more than two drinks per day.^{121,132} 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.¹²¹ Extensive evidence also implicates alcohol consumption as a cause of cancer of the breast, and probably colon and rectum cancer.¹²¹ Reducing alcohol consumption may be an important way for many women to reduce their risk of breast cancer.

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.¹³³ 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, as cardiovascular risk can be reduced by other means, such as avoiding 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: for example, children and adolescents and individuals of any age who cannot restrict their drinking to moderate levels or who have a family history of alcoholism.

UV Radiation and Skin Cancer

The vast majority of skin cancers are caused by unprotected exposure to excessive ultraviolet (UV) radiation, primarily from the sun.¹³⁴ While UV exposure is associated with a small percentage of all cancer deaths,^{134,135} the American Cancer Society estimates that UV radiation is associated with more than 1 million cases of basal and squamous skin cancers and 62,480 cases of malignant melanoma in 2008.¹ Most skin cancer deaths are due to melanoma, which is among the fastest increasing incident cancers in women in the US.¹³⁶ 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 UV radiation.

Everyone is exposed to the naturally occurring solar UV radiation, 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.¹³⁷ A second source of exposure is artificial UV radiation emitted by devices (indoor tanning lamps or booths) that are increasingly available for cosmetic use and heavily promoted by the indoor tanning industry.¹³⁸ Studies suggest that use of indoor tanning devices is a risk factor for skin cancer.^{139,140} An international comprehensive review reported that indoor tanning has no positive effect for health and found a 75% increase in melanoma risk among those who used indoor tanning booths in their teens and twenties.¹⁴¹ Thus, additional exposure to artificial UV from indoor tanning is likely to enhance the well-known detrimental consequences of excessive solar UV exposure.¹⁴¹

The use of indoor tanning lamps or booths is prevalent among young adults and women who perceive a tanned appearance as healthy and attractive.¹³⁸ In a national sample of non-Hispanic white adolescents, 24% reported using a tanning facility at least once in their lives¹⁴²; in another national survey, 10% of youth reported using an indoor tanning booth in the previous year.¹⁴³ In 26 states, legislation limiting a minor's access to indoor tanning facilities has been passed as a means to control teenage indoor tanning use. Most of these states restrict access to children of a certain age, usually around age 15, from



using any indoor tanning facility. Older adolescents, aged 16 to 18 years old, require parental permission before tanning.¹⁴⁴ Despite these important regulations, studies show many facilities repeatedly provide access to underage children.¹⁴⁵

The negative effects of UV radiation are cumulative over a lifetime. The immediate adverse effects of excessive UV 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.¹⁴⁶ On the other hand, a small amount of solar UV exposure is necessary for the production of vitamin D, which is essential for bone health. 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 intake of vitamin D is 200 IU to 600 IU.¹⁴⁷ Evidence is emerging that low vitamin D levels may be associated with an increased risk of cancers of the colon, prostate, and breast.^{148,149} More information on achieving a balanced approach to maintaining optimum vitamin D levels through diet, supplementation, and limited sun exposure is available online at www.cancer.org/docroot/NWS/content/NWS_1_1x_A_Call_for_More_Vitamin_D_Research.asp.

Sunburns

Sunburns typically occur as a result of excessive sun exposure on unprotected or poorly protected skin.^{135,137} They are characterized by skin redness (erythema) which occurs three to five hours after UV exposure. Depending on the extent of UV 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.¹⁵⁰⁻¹⁵² 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

a sunburn history.¹⁵³ 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 UV-related health effects.^{135,154}

The prevalence of sunburns begins to rise through childhood and reaches a peak in adolescence and early adulthood. An American Cancer Society study in 2004¹⁵⁵ 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 2004 Behavioral Risk Factor Surveillance System:¹⁵⁶

- Adult men were more likely to report sunburns in the past year than women: 37.0% and 30.3%, respectively. Also, sunburn rates were higher in non-Hispanic white men and women (46.9% and 39.6%, respectively) than in Hispanic white men and women (20.1% and 17.2%, respectively).
- Among other racial and ethnic groups, the reported occurrence of sunburns in the past year varies widely: 16.2% among men and 16.1% among women in Asians/Pacific Islanders, and 30.4% among men and 21.5% among women in American Indians/Alaska Natives. Non-Hispanic blacks had the lowest prevalence of sunburn (5.8% among men and women).

The susceptibility of the skin to UV 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 early in life.^{135,154} To minimize the harmful effects of excessive and unprotected sun exposure, sun protection behaviors should be a lifelong practice (see sidebar).

Sun Protection Behaviors

UV damage of unprotected skin should be minimized by limiting the amount of UV exposure, by timing outdoor activities when UV rays are less intense, and by use of protective clothing and application of adequate amounts of sunscreen (see sidebar).

Studies show that many adults and adolescents in the US do not regularly protect themselves when outdoors on sunny days.¹⁵⁸⁻¹⁶⁰

Risk Factors and Prevention Measures for Melanoma and Other Skin Cancers

Risk factors for melanoma¹³⁵

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

Risk factors for basal and squamous cell cancers¹³⁵

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

Measures to prevent skin cancer^{154,157}

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

- In a national 2004 survey of adolescents aged 11 to 18 years,¹⁵⁵ about one-third of youth reported using sunscreen always or often during the past summer and only 20% protected themselves always or often by seeking the shade; even fewer (<10%) used protective clothing (long sleeves or pants) regularly (Table 3A).
- In a national 2005 survey of adults,¹⁶¹ 28.3% reported always or often using sunscreen when outside for an hour or more on a sunny day, and 43.4% reported seeking shade (Table 3A).

While sunscreen products protect from sunburns, skin can still be damaged by prolonged stays in the sun.¹³⁷ It is important that users of sunscreen (particularly those at high risk) learn about proper selection of sunscreen types and application techniques. Sunscreens with a high SPF value are best. Adequate amounts of sunscreen should be applied 30 minutes to one hour prior to outdoor activities and reapplied after sweating, bathing, swimming, or accidental wiping away of sunscreen.¹³⁷

Sun protection practices among adults and youth have improved little during the past decades, despite efforts

Table 3A. Sun-Protection Behaviors* when Outdoors on Sunny Days, Adolescents and Adults, US, 2004, 2005

Adolescents†	Total (%)	Male (%)	Female (%)
Apply sunscreen	39.4	30.0	48.6
Wear a hat	4.9	6.5	3.3
Seeking 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

Adults‡	Total (%)	Male (%)	Female (%)
Apply sunscreen	28.3	18.7	37.4
Wear a hat	34.7	45.9	24.2
Seek the shade	43.4	38.6	47.9
Wear long-sleeved shirt	16.1	19.2	16.0
Wear long pants	26.3	52.4	38.9

*Proportion of respondents who report always or often doing the particular sun-safe behavior. †2004 prevalence of sun-safe practices on sunny days in the summer among US adolescents. ‡2005 prevalence of sun-safe practices on any sunny day among US Adults.

Source: Adolescents: Cokkinides et al. Trends in sunburns, sun protection practices, and attitudes toward sun exposure protection and tanning among US adolescents, 1998-2004. *Pediatrics* 2006; 118(3): 853-864. Adults: Health Information National Trends Survey, 2005; Brief report No. 6, Available at <http://hints.cancer.gov>.

to educate the public about the harms from excessive sun exposure and the benefits of sun protection.^{155,160} While education is important, more systematic efforts are needed to effect broader changes in behavior practices to improve and enable skin cancer preventive practices.^{155,162-164} As children and adolescents are an important target group for skin cancer prevention, to improve their sun protection practices the CDC recommends developing comprehensive programs that include school intervention components.^{157,162,165,166} However, current data from the CDC School Health Policies and Programs Study indicate that 35 states have no policies for sun safety programs in elementary, junior/middle, or senior high schools. In states where UV exposure is high year-round, parents should work with schools to develop sun protection programs at all grade levels and establish proper protection practices for their own children. Established skin cancer prevention programs, such as the SunWise programs, can provide useful resources to teach the public to protect themselves from overexposure to the sun through the use of classroom-, school-, and community-based components. (More information is available at www.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.^{167,168}



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.¹⁶⁹ Suspicious growths (or lesions) or 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.

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.¹⁶⁹ For more information about skin cancer prevention and early detection, go to www.cancer.org/docroot/PED/content/ped_7_1_Skin_Cancer_Detection_What_You_Can_Do.asp?sitearea=&level=#exam.

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). Screening can detect cancers at an earlier stage, before symptoms are evident, when treatment is more effective. In addition to detecting cancer early, screening for colorectal or cervical cancers can identify and remove precancerous abnormalities, preventing cancer altogether.¹⁷⁰ Following the recommendations for cancer screening from the American Cancer Society or the US Preventive Services Task Force is an important complement to healthy behaviors that reduces the risk of developing cancer.

The American Cancer Society screening guidelines for average risk individuals recommend that all people age 50 years and older be screened periodically for colon and rectum cancer, and that all women of designated ages be screened regularly for breast and cervical cancer. At present, the evidence is insufficient to recommend for or against prostate cancer screening in average risk men; thus, the Society and other organizations recommend that men 50 and older receive information about the benefits and limitations of testing for early prostate cancer and have an opportunity to make an informed decision. Guidelines for those at higher risk of disease recommend that early detection testing may begin at an earlier age, be performed more frequently, or use special tests.^{170,171} The American Cancer Society screening guidelines for the early detection of cancer are shown on page 30.

The American Cancer Society works through multiple avenues to promote the accessibility and widespread use of cancer screening, as well as to support educational, advocacy, and legislative strategies to improve screening rates and quality. This is an important part of the effort to meet the Society's 2015 challenge goals of reducing suffering and death caused by cancer.

Breast Cancer Screening

Breast cancer screening has been shown to reduce breast cancer mortality.¹⁷²⁻¹⁷⁵ In the US, death rates from breast cancer in women have been declining since 1990, due in large part to early detection by mammography screening and improvements in treatment.¹ Currently, 61% of breast cancers are diagnosed at a localized stage, for which the five-year survival rate is 98%.¹⁷⁶ Further



reductions in breast cancer death rates are possible by increasing mammography screening rates and providing timely access to high-quality follow-up and treatment.¹⁷⁷

After continuously increasing for over two decades, female breast cancer incidence rates decreased by 3.5% per year from 2001 to 2004.¹ Several factors might affect breast cancer incidence and contribute to differences in rates over time. At least two factors appear to have contributed to the recent decline: reduced use of hormone replacement therapy (HRT) among postmenopausal women and the slight drop in mammography utilization from 2000-2005 (Figure 4A), especially among women aged 50 to 64.¹⁸²

Despite the relatively high prevalence of mammography screening in the US, recent 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.¹⁷⁸⁻¹⁸¹ These indicators of inadequate screening were found to be associated with more advanced tumor size and stage at diagnosis.

It is important that women age 40 and older receive mammography screening on an annual basis (see sidebar, page 30) at accredited mammography screening facilities. A listing of accredited mammography screening centers or facilities is available at www.fda.gov/cdrh/mammography/certified.html.

In 2007, an expert panel convened by the Society reported new recommendations for breast screening with magnetic resonance imaging (MRI) as an adjunct to mammography for women at increased risk for breast cancer.¹⁷¹ The Society recommends annual screening using MRI in addition to yearly mammography for women at high lifetime risk (approximately 20%-25% or greater) of the disease based on the presence of mutations in the breast cancer susceptibility genes,

Screening Guidelines

For the Early Detection of Cancer in Asymptomatic People

Site	Recommendation
Breast	<ul style="list-style-type: none"> • Yearly mammograms are recommended starting at age 40. The age at which screening should be stopped should be individualized by considering the potential risks and benefits of screening in the context of overall health status and longevity. • Clinical breast exam should be part of a periodic health exam about every 3 years for women in their 20s and 30s and every year for women 40 and older. • Women should know how their breasts normally feel and report any breast change promptly to their health care providers. Breast self-exam is an option for women starting in their 20s. • Screening MRI is recommended for women with an approximately 20%-25% or greater lifetime risk of breast cancer, including women with a strong family history of breast or ovarian cancer and women who were treated for Hodgkin disease.
Colon & rectum	<p>Beginning at age 50, men and women at average risk should begin screening with one of the examination schedules below.</p> <p>Tests that detect adenomatous polyps and cancer:</p> <ul style="list-style-type: none"> • A flexible sigmoidoscopy every 5 years • A colonoscopy every 10 years • A double-contrast barium enema every 5 years • Computed Tomographic (CT) colonography every 5 years <p>Tests that primarily detect cancer:</p> <ul style="list-style-type: none"> • A guaiac-based fecal occult blood test (gFOBT) or fecal immunochemical test (FIT), with high test sensitivity for cancer every year • Stool DNA test (interval uncertain) <p>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.</p>
Prostate	<p>The PSA test and the digital rectal examination should be offered annually, beginning at age 50, to men who have a life expectancy of at least 10 years. Men at high risk (African American men and men with a strong family history of 1 or more first-degree relatives diagnosed with prostate cancer at an early age) should begin testing at age 45. For both men at average risk and high risk, information should be provided about what is known and what is uncertain about the benefits and limitations of early detection and treatment of prostate cancer so that they can make an informed decision about testing.</p>
Uterus	<p>Cervix: Screening should begin approximately 3 years after a woman begins having vaginal intercourse, but no later than 21 years of age. Screening should be done every year with regular Pap tests or every 2 years using liquid based tests. At or after age 30, women who have had 3 normal test results in a row may get screened every 2 to 3 years. Alternatively, cervical cancer screening with HPV DNA testing and conventional or liquid-based cytology could be performed every 3 years. However, doctors may suggest a woman get screened more often if she has certain risk factors, such as HIV infection or a weak immune system. Women aged 70 and older who have had 3 or more consecutive normal Pap tests in the last 10 years may choose to stop cervical cancer screening. Screening after total hysterectomy (with removal of the cervix) is not necessary unless the surgery was done as a treatment for cervical cancer.</p> <p>Endometrium: The American Cancer Society recommends that at the time of menopause all women should be informed about the risks and symptoms of endometrial cancer and strongly encouraged to report any unexpected bleeding or spotting to their physicians. Annual screening for endometrial cancer with endometrial biopsy beginning at age 35 should be offered to women with or at risk for hereditary nonpolyposis colon cancer (HNPCC).</p>
Cancer-related checkup	<p>For individuals undergoing periodic health examinations, a cancer-related checkup should include health counseling about tobacco, sun exposure, diet and nutrition, sexual practices, environmental and occupational exposures and depending on a person's age and gender, might include examinations for cancers of the thyroid, oral cavity, skin, lymph nodes, testes, and ovaries, as well as for some nonmalignant diseases.</p>

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

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BRCA1 and BRCA2, strong family history of breast and/or ovarian cancer, or prior chest radiation therapy (e.g., for Hodgkin disease).¹⁷¹

Prevalence of Mammography Screening in the US

National breast cancer screening data are available from the National Health Interview Survey (NHIS) which measures screening within the past year and past two years. The NHIS has tracked trends in mammography since 1987.

- 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 and remained stable through 2003. In 2005, 66.5% of women reported having a recent mammogram, which was 4 percentage points lower than 2000 levels. Smaller declines in screening rates were also observed across all racial/ethnic subgroups during this period (Figure 4A).^{182,183}
- White women aged 40 and older were more likely to report a mammogram in the past two years (68.1%) than any other racial/ethnic group. Screening rates were 66.6% in American Indian/Alaska Native women, 64.9% in African American women, 59.6% in Hispanic women, and 54.2% in Asian women (Table 4A).

- The lowest prevalence of mammography use in the past two years occurred among women who lack health insurance (33.2%), followed by immigrant women who have lived in the US for less than 10 years (50%) (Table 4A).
- Only 51.2% 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 4A. Mammography, Women 40 and Older, US, 2005

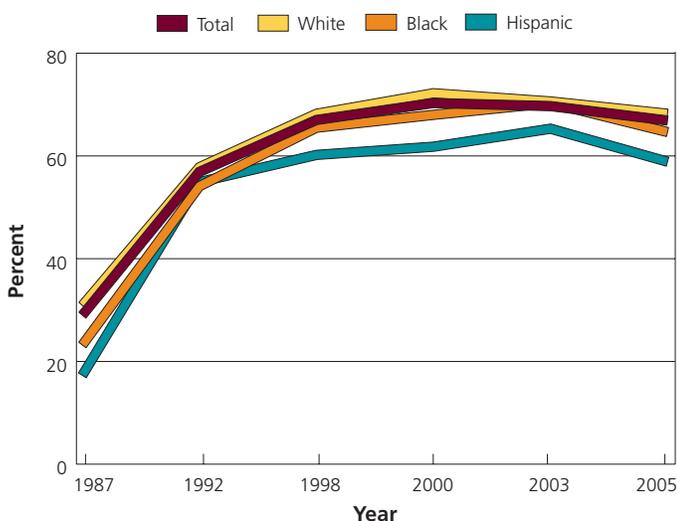
Characteristic	% Mammogram within the past year*	% Mammogram within the past 2 years*
Age		
40-49	47.8	63.5
50-64	55.5	71.8
65+	50.2	63.8
Race/ethnicity		
White (non-Hispanic)	52.9	68.1
African American (non-Hispanic)	49.9	64.9
Hispanic/Latina	41.7	59.6
American Indian/Alaska Native†	46.9	66.6
Asian‡	37.9	54.2
Education (years)		
11 or fewer	40.4	53.0
12	49.0	64.4
13 to 15	53.6	69.1
16 or more	60.2	76.8
Health insurance coverage		
Yes	54.1	69.8
No	24.1	33.2
Immigration§		
Born in US	52.2	67.2
Born in US territory	45.4	59.4
In US less than 10 years	34.9	50.0
In US 10 years or more	46.0	63.3
Total	51.2	66.5

*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 2005, National Center for Health Statistics, Centers for Disease Control and Prevention, 2006.

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Figure 4A. Mammography Within the Past Two Years*, Women 40 and Older, by Race/Ethnicity, US, 1987-2005



*Estimates are age-adjusted to the 2000 US standard population.

Source: 1987-2003: National Cancer Institute. Cancer Trends Progress Report – 2005 Update. Available at <http://progressreport.cancer.gov/>. Accessed October 10, 2007. 2005: 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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Table 4B. Mammography and Clinical Breast Exam, Women 40 and Older, by State, US, 2006

	% 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	59.6	59.3	60.2	26.4	29.4	52.8	54.8	48.2	21.5	23.3
Alaska	55.7	53.9	63.5	37.5	45.8	50.8	49.7	56.2	34.7	38.7
Arizona	59.7	56.1	67.1	38.5	32.1	51.8	49.9	55.8	28.3	25.5
Arkansas	54.5	52.6	58.4	20.8	27.5	46.5	46.9	45.7	15.9	23.5
California	61.0	59.4	65.2	37.2	40.1	49.7	49.9	49.2	26.7	35.0
Colorado	56.4	55.3	59.7	27.2	27.1	49.0	49.1	48.6	22.1	25.6
Connecticut	69.9	69.1	71.7	35.8	43.8	62.0	63.3	59.1	25.0	38.0
Delaware	70.2	70.2	70.2	35.7	57.1	62.8	65.0	58.0	31.2	50.0
Dist. of Columbia	64.2	63.0	66.8	39.5	36.6	57.5	58.7	55.0	33.5	32.3
Florida	64.8	61.0	71.2	32.8	33.4	54.9	54.1	56.2	24.5	27.8
Georgia	64.0	62.2	69.1	39.3	42.5	57.4	57.9	56.0	35.0	37.9
Hawaii	62.7	61.1	66.1	31.4	27.5	53.0	53.2	52.7	25.4	25.7
Idaho	51.2	47.6	59.9	24.7	21.8	45.3	43.1	50.5	22.7	19.1
Illinois	58.1	56.9	60.8	27.6	30.7	50.2	50.7	49.1	20.9	28.8
Indiana	54.2	53.0	56.8	27.3	28.8	46.2	47.0	44.4	20.5	24.1
Iowa	63.5	62.9	64.5	33.4	29.7	55.8	57.6	52.1	29.6	25.0
Kansas	60.3	58.1	64.9	22.5	31.0	53.2	53.1	53.5	19.8	26.9
Kentucky	57.6	56.4	60.5	27.1	29.3	49.1	49.2	48.8	21.2	26.2
Louisiana	61.3	60.5	63.2	36.5	36.9	54.1	55.1	51.9	31.1	32.5
Maine	68.0	66.7	70.8	26.9	38.5	60.7	61.4	59.2	20.9	33.0
Maryland	63.9	62.7	67.0	39.7	39.6	57.0	57.2	56.3	35.2	34.3
Massachusetts	71.4	70.2	74.1	37.4	61.0	62.8	63.8	60.6	29.8	56.8
Michigan	64.2	63.4	65.9	30.8	38.3	57.7	59.4	53.9	28.4	36.9
Minnesota	68.0	67.6	69.0	33.1	27.1	63.8	64.3	62.6	30.5	26.7
Mississippi	51.2	50.6	52.4	27.7	31.1	44.5	45.3	42.7	23.5	25.3
Missouri	56.6	57.1	55.5	25.2	23.1	47.2	50.5	40.0	22.6	21.4
Montana	57.4	55.1	62.7	33.4	28.9	51.0	50.5	52.1	26.3	24.2
Nebraska	59.6	59.3	60.2	30.8	39.8	53.0	55.3	48.2	26.2	35.2
Nevada	54.5	54.7	54.0	26.7	34.0	47.1	48.7	42.8	22.6	31.7
New Hampshire	66.1	65.5	67.8	20.2	31.6	60.5	61.8	57.0	20.0	30.6
New Jersey	63.8	64.8	61.5	43.0	44.1	56.1	58.5	50.9	37.8	34.1
New Mexico	52.1	51.1	54.3	26.2	28.4	45.2	45.6	44.2	20.4	23.7
New York	65.0	63.8	67.7	37.7	46.8	57.1	58.3	54.5	26.3	37.4
North Carolina	63.9	63.5	64.9	34.4	35.9	53.9	55.3	50.5	28.6	29.8
North Dakota	63.0	62.0	65.1	40.7	50.2	56.0	57.4	53.3	36.0	48.8
Ohio	61.0	58.9	65.7	27.1	49.5	53.0	54.5	49.5	24.1	44.1
Oklahoma	48.7	46.9	52.5	21.7	26.2	41.1	41.6	39.9	18.9	24.3
Oregon	61.1	57.6	69.1	25.9	26.3	52.3	51.0	55.5	19.4	23.8
Pennsylvania	62.2	60.8	64.8	31.6	26.2	54.9	55.4	53.9	30.2	23.0
Rhode Island	70.8	71.0	70.3	41.0	50.3	64.8	66.9	60.5	37.1	46.2
South Carolina	57.4	55.7	61.2	26.3	34.0	49.2	49.3	48.9	22.3	28.8
South Dakota	59.1	56.5	63.9	30.1	29.9	51.9	51.9	52.1	27.5	27.3
Tennessee	61.7	61.1	63.0	39.9	37.0	55.6	56.5	53.3	34.0	31.3
Texas	56.0	54.0	61.4	27.2	30.2	50.4	50.4	50.2	24.9	26.7
Utah	48.9	45.7	57.0	21.0	22.2	39.5	38.6	41.8	16.4	18.0
Vermont	64.2	62.7	67.8	28.1	38.0	56.5	57.5	54.1	25.7	33.4
Virginia	62.2	60.6	66.5	33.5	25.2	54.6	55.0	53.4	28.1	23.9
Washington	59.5	57.4	65.0	27.5	29.4	51.7	51.6	51.8	23.2	26.0
West Virginia	61.9	61.5	62.7	27.0	28.3	54.2	56.6	49.3	24.6	26.1
Wisconsin	62.2	60.9	65.2	20.6	38.0	57.8	57.3	58.9	19.1	36.5
Wyoming	52.7	50.0	59.6	29.2	22.2	45.3	44.7	47.1	24.5	19.1
United States¶	61.2	59.7	64.6	32.2	34.9	53.2	53.8	51.9	26.2	30.3
Range	48.7-71.4	45.7-71.0	52.4-74.1	20.2-43.0	21.8-61.0	39.5-64.8	38.6-66.9	39.9-62.6	15.9-37.8	18.0-56.8

*A mammogram within the past year. †Both a mammogram and clinical breast exam within the past year. ‡Women aged 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 2006, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2007.

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State-level Mammography Screening

Current state-level breast cancer screening data are available from the 2006 Behavioral Risk Factor Surveillance System:

- In 2006, the percentage of women aged 40 and older who reported having a mammogram in the past year ranged from 48.7% in Oklahoma to 71.4% 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 second lowest prevalence of mammography screening (48.9%).¹⁸⁴
- Screening participation rates are approximately 6 to 9 percentage points lower when measuring the percentage of women who had a mammogram and clinical breast exam, ranging from 39.5% in Utah to 64.8% in Rhode Island.
- 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).

A recent national study found small decreases in mammography screening between 2000 and 2005.¹⁸² On the other hand, more recent estimates from the nationwide state-level Behavioral Risk Factor Surveillance System surveys show that between 2004 and 2006, the prevalence of mammography screening (within the past year) rose by 2.9 percentage points (from 58.3% to 61.2%). Ongoing monitoring of mammography utilization will help clarify trends in the US.¹⁸²

Rates of mammography continue to be low among those with low income levels and individuals who lack health insurance coverage.^{1,185,186} Consequently, these women are more likely to have their breast cancers detected at an advanced stage, when treatment is less likely to be effective.^{179,187} Programs and policies that both promote and enable access to mammography screening for all eligible low-income uninsured and underinsured women need to be enhanced and supported.¹⁸⁸

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.¹⁸⁹ Between 60% and 80% of women who are found to have advanced



cervical cancer have not had a Pap test in the past five years.¹⁹⁰ 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.¹⁷⁷ Historically, the Society played a critical role in developing and promoting the use of the Pap test. Cervical cancer is now one of the most successfully treated cancers,¹⁸⁹ and with the approved vaccine immunization against HPV among young girls, there is a great potential for further reducing the occurrence of cervical cancer in the US.

HPV Vaccine and Cervical Cancer (and Vulvar Cancer) Prevention

Human papillomavirus (HPV) is the most common sexually transmitted infection in the United States, with approximately 6.2 million people newly infected annually.^{191,192} 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 18.¹⁹³ 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^{193,194} and in reducing rates of precursor lesions (adenoma in situ or intraepithelial neoplasia) in the cervix.^{195,196} These vaccines, made from non-infectious HPV-like particles, 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).^{191,192}

In June 2006, a vaccine (Gardasil®) that protects against four types of HPV, including types 16 and 18, was approved by the US Food and Drug Administration (FDA) for use in females aged 9 to 26. To be most effective, the HPV vaccine should be given before a person becomes sexually active, and in three doses within one year. The

Summary of American Cancer Society Recommendations for HPV Vaccine Use to Prevent Cervical Cancer and its Precursors¹⁹⁸

- Routine HPV vaccination is recommended for females aged 11-12.
- Females as young as 9 years may receive HPV vaccination.
- HPV vaccination is also recommended for females aged 13-18 years to catch up missed vaccine or complete the vaccination series.
- There are currently insufficient data* to recommend for or against universal vaccination of females aged 19-26 years in the general population. A decision about whether a woman aged 19-26 years 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 increasing number of lifetime sexual partners.
- HPV vaccination is not currently recommended for women over age 26 years or for men.
- Screening for cervical intraepithelial neoplasia (CIN) and cancer should continue in both vaccinated and unvaccinated women according to current American Cancer Society early detection guidelines.

* Insufficient evidence of benefit in women aged 19-26 years refers to (1) clinical trial data in women with an average of 2, but not more than 4, 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 4 lifetime sexual partners, and (3) the lack of cost-effectiveness analyses for vaccination in this age group.

Federal Advisory Committee on Immunization Practices (ACIP) has recommended that the vaccine be routinely given to females aged 11 to 12 and as early as age 9, at the discretion of doctors. The committee also recommended females ages 13 to 26 who have not yet been vaccinated receive “catch-up” vaccinations.^{191,197} Side effects from Gardasil® are mild and may include pain or tenderness at the injection site.¹⁹¹ In January 2007, the American Cancer Society published its own recommendations for HPV vaccine use¹⁹⁸ (see sidebar). These guidelines are generally consistent with those of the ACIP.

The HPV vaccine cost in the US is approximately \$120 per dose (or \$360 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. It is expected that private insurance plans will cover the cost in accordance with ACIP recommendations. However, there may be a lag time between the vaccine’s approval and when it is covered by health plans.¹⁹²

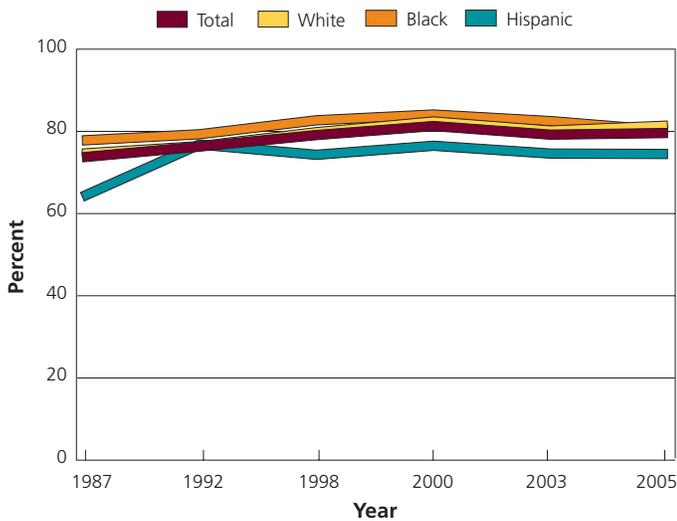
The ACIP has announced the availability of the HPV vaccine in the federal Vaccine for Children (VFC) entitlement program, which covers vaccine costs for children and teens who do not have insurance and for some children and teens who are underinsured or Medicaid eligible.¹⁹² The CDC is in the process of collecting information to monitor the uptake of HPV vaccination in adolescents through the National Immunization Survey (NIS-Teens); this information is expected to be available in 2008.¹⁹⁹

In 2007, the CDC initiated 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 healthcare 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 check-up, which is endorsed by the American Academy for Pediatrics (AAP) and the American Academy of Family Physicians (AAFP), as well as the CDC. More information is available at www.cdc.gov/vaccines/spec-grps/preteens-adol/07gallery/default.htm.

For several reasons, the HPV vaccine will only supplement, rather than replace, the Pap test. First, the vaccine will not provide protection against all types of HPV that cause cervical cancer. Second, women may not receive the full benefits of the vaccine if they do not complete the vaccine series. Third, women may not receive the full benefits of the vaccine if they receive the vaccine after they have been infected with one or more HPV types. Thus, women of all ages should continue to receive regular cervical cancer screening.¹⁹⁸

The promise of cancer prevention vaccines from a broad public health perspective can be fully realized only if vaccination reaches those subgroups of women for whom access to cervical cancer screening services is most problematic, particularly immigrants, those living in rural areas, low-income and uninsured females, and others who have limited access to health care services.¹⁹⁸ Hence, the Society supports the widespread availability and use of the vaccine consistent with guidelines published.²⁰⁰ After the announcement of the ACIP’s recommendation, New Hampshire became the first state to offer the vaccine to girls at no cost, and five states (Colorado, Illinois, New Mexico, Nevada, and Rhode Island) require that private insurers cover the cost of the vaccine. Some states have enacted legislation that would create an HPV vaccine information program.²⁰¹

Figure 4B. Pap Test Within the Past Three Years*, Women 18 and Older, by Race/Ethnicity, US, 1987-2005



*Estimates are age-adjusted to the 2000 US standard population.

Source: 1987-2003: National Cancer Institute. Cancer Trends Progress Report – 2005 Update. Available at <http://progressreport.cancer.gov/>. Accessed October 10, 2007. 2005: 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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Prevalence of Pap Test Screening in the US

According to data from the National Health Interview surveys:¹⁸³

- Among women 18 years and older, 79.6% reported having a Pap test within the past three years in 2005, up from 74% in 1987. Increases in Pap test use have occurred among women of all racial and ethnic groups (Figure 4B).
- In 2005, the prevalence of cervical cancer screening varied by race and ethnicity: White women (81.4%) were most likely to have had a recent test and Asian women (65.8%) were least likely (Table 4C).
- In 2005, the prevalence of recent Pap test use was lowest among recent immigrants (66.8%), women with no health insurance (61.4%), and older women (59.1%) (Table 4C).

State-level Cervical Cancer Screening

- Across the states surveyed by the Behavioral Risk Factor Surveillance System in 2006 (Table 4D), the recent Pap test percentage among women aged 18 and older with an intact uterus was 83.7%, ranging from 73.4% in Utah to 89.0% in Maine and the District of Columbia.

Table 4C. Pap Test*, Women 18 and Older, US, 2005

Characteristic	% Pap test within past 3 years [†]
Age (years)	
18 to 20	61.4
21 to 29	84.7
30 to 39	88.9
40 to 49	86.5
50 to 59	82.0
60 to 64	79.2
65 to 85	59.1
Race/ethnicity	
White (non-Hispanic)	81.4
African American (non-Hispanic)	80.2
Hispanic/Latina	74.5
American Indian/Alaska Native	75.8
Asian [‡]	65.8
Education (years)[§]	
11 or fewer	68.0
12	77.0
13 to 15	83.7
16 or more	88.1
Health insurance coverage	
Yes	82.4
No	61.4
Immigration[¶]	
Born in US	81.4
Born in US territory	74.5
In US less than 10 years	66.8
In US 10 years or more	73.0
Total	79.6

*A Pap test within the past three years for all women over 18, irrespective of hysterectomy status. †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. §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 2005, National Center for Health Statistics, Centers for Disease Control and Prevention, 2006.

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Programs to Increase the Rate of Breast and Cervical Cancer Screening

The CDC's National Breast and Cervical Cancer Early Detection Program (NBCCEDP) helps low-income, uninsured women gain access to timely, high-quality screening exams for the early detection of breast and cervical cancers and diagnostic services.²⁰² The program is currently implemented in all 50 states, the District of Columbia, four US territories, and 13 American Indian/Alaska Native organizations.²⁰³ About 50% of the women screened have been from racial/ethnic minority groups.

Table 4D. Pap Test, Women 18 and Older, by State, US, 2006

% 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	82.7	83.9	74.8	76.0	72.7
Alaska	86.4	87.1	77.7	72.8	77.6
Arizona	83.8	85.4	70.9	75.6	69.7
Arkansas	79.9	82.1	66.1	70.0	69.9
California	83.5	84.9	71.8	77.1	76.8
Colorado	84.9	86.4	69.3	70.8	74.9
Connecticut	86.8	90.0	69.4	75.3	76.6
Delaware	88.7	91.2	74.1	78.2	71.0
Dist. of Columbia	89.0	90.1	80.4	81.4	82.2
Florida	82.7	84.5	73.5	70.5	71.4
Georgia	87.2	88.0	78.7	76.9	76.1
Hawaii	81.9	83.3	73.4	66.0	64.1
Idaho	76.4	78.5	56.7	63.1	74.0
Illinois	83.4	86.2	63.3	69.6	70.0
Indiana	80.7	82.9	65.7	67.1	69.5
Iowa	85.9	89.0	68.6	72.1	76.3
Kansas	83.0	85.5	65.3	67.7	69.7
Kentucky	82.6	84.4	66.2	70.2	69.3
Louisiana	83.9	85.0	74.7	72.0	77.5
Maine	89.0	91.9	72.6	66.4	78.1
Maryland	87.7	89.0	76.9	71.8	73.2
Massachusetts	87.7	90.1	73.4	71.3	70.3
Michigan	85.5	86.6	78.3	62.5	68.4
Minnesota	86.0	88.0	73.0	71.9	82.6
Mississippi	83.6	86.4	61.9	76.1	81.0
Missouri	79.6	82.4	63.2	65.4	69.9
Montana	81.8	83.4	71.4	70.1	72.3
Nebraska	81.1	84.3	62.3	74.6	76.4
Nevada	81.7	83.8	64.8	73.5	79.9
New Hampshire	87.8	89.8	73.3	63.1	77.9
New Jersey	83.7	86.5	67.9	72.6	73.3
New Mexico	82.6	85.1	63.1	73.5	74.3
New York	85.2	87.1	74.1	76.4	73.6
North Carolina	86.5	88.2	74.6	78.6	78.6
North Dakota	84.0	86.5	71.2	76.4	76.0
Ohio	83.0	85.2	68.6	73.3	59.4
Oklahoma	78.6	81.2	58.9	66.1	67.9
Oregon	83.2	85.4	66.5	76.4	78.0
Pennsylvania	82.6	85.4	67.9	67.9	67.7
Rhode Island	87.5	90.5	70.1	74.1	80.1
South Carolina	86.3	87.6	77.6	73.5	75.8
South Dakota	84.7	88.2	66.8	77.0	76.2
Tennessee	85.7	88.3	65.9	72.3	75.5
Texas	79.9	80.3	76.5	70.9	70.6
Utah	73.4	74.4	61.7	58.6	58.7
Vermont	86.8	89.3	72.1	66.9	73.7
Virginia	85.4	87.6	67.6	80.9	74.1
Washington	83.6	85.6	67.3	71.7	73.0
West Virginia	83.3	86.1	68.0	72.9	76.1
Wisconsin	85.7	88.6	68.2	67.2	63.1
Wyoming	80.2	81.9	66.9	66.6	67.4
United States [¶]	83.7	85.6	70.8	72.8	72.8
Range	73.4-89.0	74.4-91.9	56.7-80.4	58.6-81.4	58.7-82.6

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

Source: Behavioral Risk Factor Surveillance System Public Use Data Tape 2006, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2007.

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Since 1991, the NBCCEDP has served more than 2.9 million women, provided more than 6.9 million screening examinations, and diagnosed more than 29,000 breast cancers, 94,000 precancerous cervical lesions, and 1,800 cases of invasive cervical cancer.²⁰²

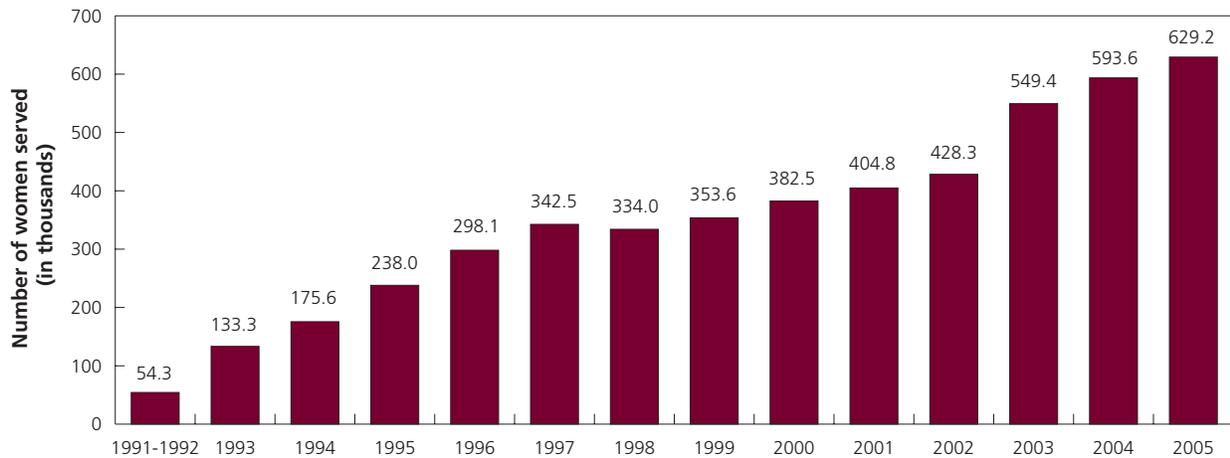
From 1991 to 2005, there was a steady growth in the number of low-income women served by the NBCCEDP (Figure 4C). Since 2001, the program has consistently served more than 400,000 women annually. However, the CDC estimates that this program is currently only reaching approximately 13% of the estimated 4 million US women aged 40 to 64 who are low-income, uninsured, and/or are underinsured.¹⁸⁸ In light of this unmet need, the Society continues to advocate for additional funding from Congress for the NBCCEDP. The Society is also partnering with state health departments and other key organizations to implement best practices that will strengthen the NBCCEDP.

Since October 1, 2000, the Breast and Cervical Cancer Prevention and Treatment Act has given states the option to provide Medicaid coverage of medical assistance and follow-up and treatment for women diagnosed with cancer through the NBCCEDP. Today, all 50 states and the District of Columbia have elected to provide this coverage.²⁰³ Currently, the Society is working to ensure that state Medicaid dollars supporting the treatment program are protected.

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 90% for colorectal cancer

Figure 4C. Number of Women Served* in the National Breast and Cervical Cancer Early Detection Program (NBCCEDP), 1991-2005†



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

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

American Cancer Society, Surveillance Research

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 colon cancers often develop, can be identified and removed.^{170,204} Of the 49,960 people expected to die of colorectal cancers in 2008, appropriate testing could save more than half.²⁰⁵

The American Cancer Society and other organizations have independently developed and promoted colorectal cancer screening guidelines for more than two decades. In an effort to increase colorectal cancer screening rates, the American Cancer 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, the American Gastroenterological Association, and the American College of Physicians) recently collaborated on updated consensus guidelines released in March of 2008.²⁰⁶ The leadership of these organizations believes that a single set of jointly developed and promoted recommendations would highlight their importance and promote evidence-based practice. The guidelines highlight the potential of some newer screening methods. They also emphasize the importance of quality in colorectal cancer screening and delineate a number of quality factors required to attain optimal benefits from screening. As with previous guidelines, there are several recommended options for colorectal cancer screening (see sidebar, page 30). The new guidelines categorize screening methods into

two distinct groups: tests that primarily detect cancer and tests that detect both cancer and pre-cancerous adenomatous polyps (and thus have a greater potential to contribute to cancer prevention). 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, which 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.^{170,204,206} Despite the availability of these screening tests and their lifesaving potential, the current rates of colorectal cancer screening in US adults aged 50 and older remain inadequate.²⁰⁷⁻²⁰⁹

Prevalence of Colorectal Cancer Screening in the US

Although utilization is improving, colorectal cancer screening prevalence continues to lag behind use of mammography and Pap testing.^{185,210,211,212}

- Between 2000 and 2005, the use of colorectal cancer screening (either a FOBT within the past year or a colorectal endoscopic procedure within the past 10 years) among US adults aged 50 and older increased from 42.5% to 46.8% (Figure 4D).
- Increased utilization of colonoscopy contributed to the overall increase in the prevalence of colorectal cancer screening (Figure 4D).²¹² Among adults aged



50 and older, the prevalence of being up-to-date for colonoscopy (within the past 10 years) increased from 20% in 2000 to 39% in 2005. In contrast, this period saw

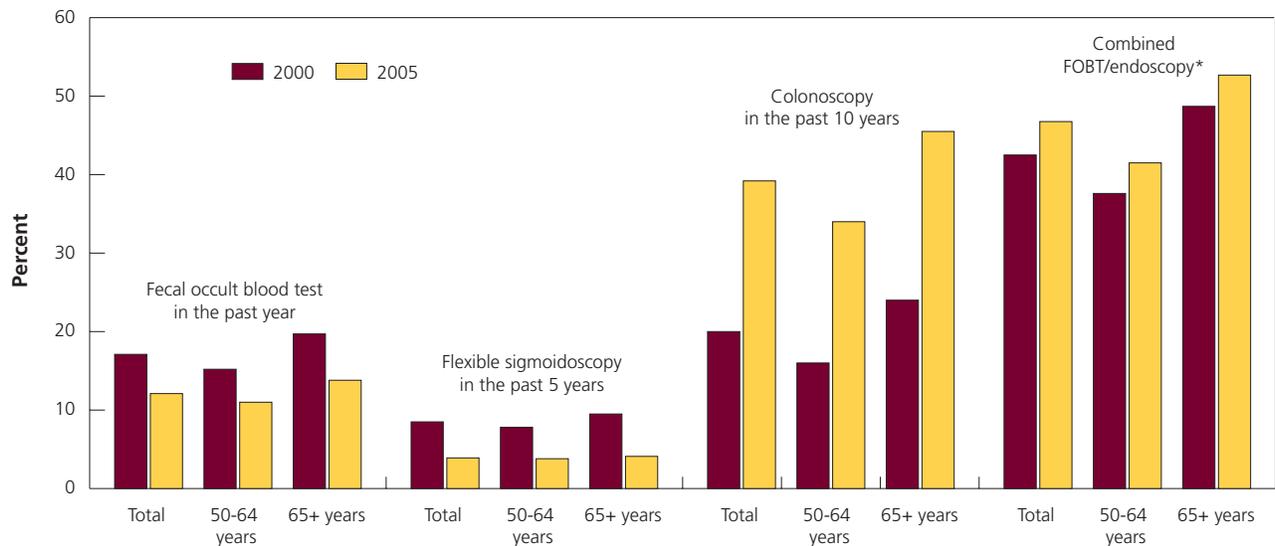
no increases in the proportions of adults who were up-to-date with either the use of FOBT in the past year or use of flexible sigmoidoscopy test in the past five years (Figure 4D).

- In general, adults aged 65 and older are more likely to be up-to-date with colorectal cancer screening than those aged 50-64 years (Figures 4D).
- In 2005, the prevalence of colorectal cancer screening varied by race, education, health insurance coverage, and immigration status; those without health insurance, recent immigrants, those with less than a high school education, Hispanics, and immigrants who had been in the US for less than 10 years were the least likely to have had a colorectal cancer screening test (Table 4E).

State-Level Colorectal Cancer Screening

- Across the states surveyed in 2006, the recent fecal occult blood test percentages for adults aged 50 and older ranged from 10.5% in Alaska to 22.4% in Maine and 22.5% in the District of Columbia (Table 4F). Colorectal cancer screening with endoscopy tests (either a sigmoidoscopy or colonoscopy within the past 10 years) ranged from 46.6% in Mississippi to 66.4% in Rhode Island (Table 4F).

Figure 4D. Colorectal Cancer Test Within Recommended Time Intervals, Adults 50 and Older, US, 2005



*Either a fecal occult blood test within the past year or sigmoidoscopy in the past 5 years or colonoscopy within the past 10 years. Total rates are age-adjusted to the 2000 US standard population.

Source: National Health Interview Survey Public Use Data File 2000, 2005. National Center for Health Statistics, Centers for Disease Control and Prevention, 2001, 2006.

American Cancer Society, Surveillance Research

There is a wide disparity in colorectal cancer screening by health insurance status, which is related to lower access to primary care and less utilization of preventive services in general among the uninsured, as well as lack of coverage for colorectal cancer screening.^{185,209,212-214} Lack of coverage for the full range of colorectal cancer screening tests may contribute to low utilization of these tests among individuals with health insurance. It is difficult to evaluate insurance coverage systematically because private insurers often consider such information proprietary. There can also be confusion about whether coverage applies to screening or only diagnostic procedures, and whether the full range of tests is available to those at average risk. The limited available data suggest that many private health plans do not cover the full range of screening tests, and many do not cover screening colonoscopy for beneficiaries aged 50 to 64 at average risk for colorectal cancer.²¹⁵ 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 by Medicare since 2001 and by private health plans as a result of state legislation, and the establishment of screening programs in certain states.^{213,216-218} Further efforts to increase utilization are needed, especially for persons with less access to health care.^{185,209,212-214}

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 its sister organization the American Cancer Society Cancer Action NetworkSM (ACS CAN) are promoting federal legislation that will authorize a national program at the CDC to provide colorectal cancer screening, treatment, and outreach to medically underserved communities. The Colorectal Cancer Early Detection, Prevention, and Treatment Act (H.R. 1738) could have a direct impact on reducing colon cancer deaths by screening more Americans for colorectal cancer and then providing them with the necessary treatment.

Table 4E. Colorectal Cancer Screening, Adults 50 and Older, US, 2005

Characteristic	% Fecal Occult Blood Test**§	% Endoscopy ^{†§}	% Combined FOBT/Endoscopy ^{†§}
Gender			
Male	12.7	44.6	48.2
Female	11.7	42.0	45.8
Age (years)			
50-64	10.6	37.7	41.8
65+	13.8	49.5	52.7
Race/ethnicity			
White (non-Hispanic)	12.6	45.8	49.5
African American (non-Hispanic)	10.3	36.9	40.1
Hispanic/Latino	9.4	28.3	31.9
American Indian/Alaska Native [¶]	5.8	31.7	34.4
Asian [#]	10.8	28.3	33.8
Education (years)			
11 or fewer	8.9	32.4	35.0
12	11.2	39.9	44.0
13 to 15	13.8	46.3	50.5
16 or more	15.3	53.7	57.3
Health insurance coverage			
Yes	12.7	45.0	48.8
No	3.1	13.1	14.9
Immigration**			
Born in US	12.5	44.7	48.5
Born in US Territory	12.8	43.4	48.1
In US less than 10 years	2.6	13.6	15.7
In US 10 years or more	9.1	31.3	34.0
Total	12.1	43.1	46.8

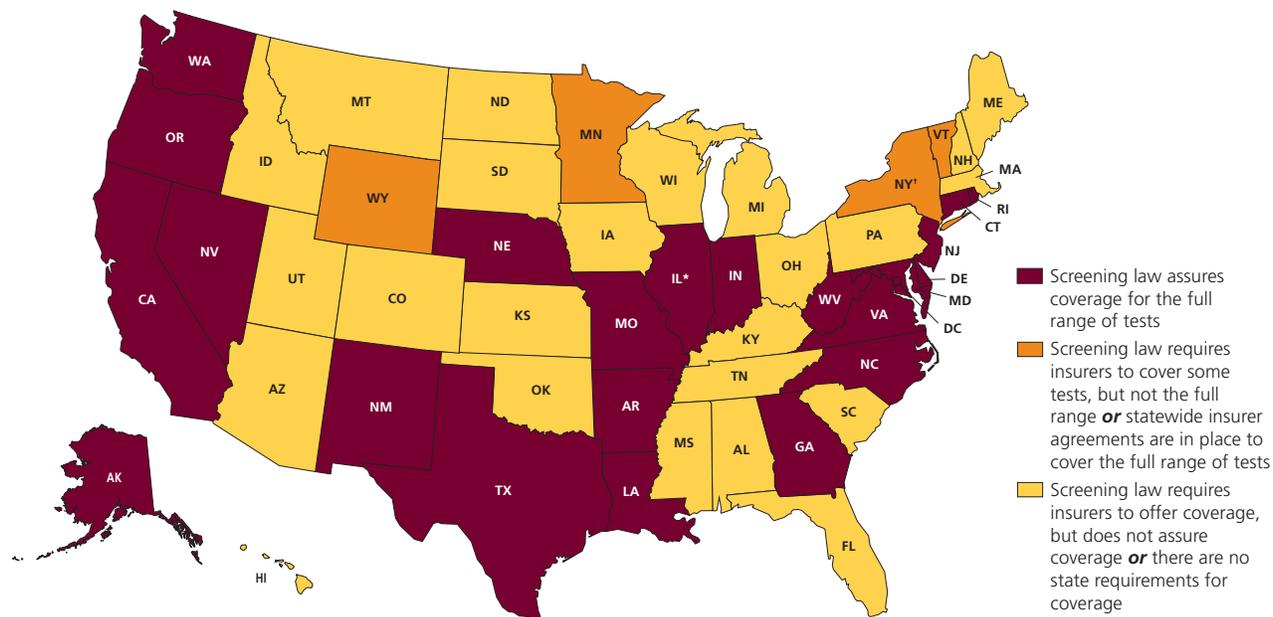
*A home fecal occult blood test within the past year. †A sigmoidoscopy within the past five years or a colonoscopy within the past 10 years. ‡Either a fecal occult blood test within the past year, sigmoidoscopy within the past five years or a colonoscopy within the past 10 years. §Percentages are age-adjusted to the 2000 US standard population. See Statistical Notes for more information. ¶Estimates should be interpreted with caution because of the small sample size. #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, 2005, National Center for Health Statistics, Centers for Disease Control and Prevention, 2006.

American Cancer Society, Surveillance Research

The CDC has established a three-year colorectal cancer screening pilot program at five sites across the nation to explore the feasibility of establishing a national colorectal cancer screening program for the medically underserved and to learn which settings and program models may be most viable and cost-effective. Grantees have the flexibility to explore new ways of delivering screening and treatment to help meet the needs of their communities. Such programs for the uninsured or underserved are also being explored at the state level, and some states, such as New York and Maryland, have already implemented colorectal cancer screening programs that are improving access to needed services.^{219,220}

Figure 4E. Colorectal Cancer Screening Coverage Legislation, by State, US, 2008



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

Sources: Health Policy Tracking Service & Individual state bill tracking services. Provided by American Cancer Society Cancer Action Network, September 2007.

Improving 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 legislation to ensure that private health insurance plans cover the full range of recommended screening methods. To date, these efforts have succeeded in 22 states and the District of Columbia (Figure 4E). Such coverage can be provided for little or no additional cost to health plans.²²¹

The Society is also collaborating with the Centers for Medicare & Medicaid Services (CMS) to help CMS improve colorectal cancer screening among the 44 million Medicare beneficiaries. CMS has leveraged resources across the agency to promote a wide range of interventions, including communicating with beneficiaries who are due for screening, informing physicians about Medicare colorectal cancer screening coverage, and exploring the inclusion of colorectal cancer screening measures in Medicare quality improvement initiatives. Since 2001, Medicare has covered all Society-recommended colorectal cancer screening options, and in 2007, these screenings were no longer subject to a deductible. The Society and its sister advocacy organization, the American Cancer Society Cancer Action NetworkSM (ACS CAN) are currently involved in advocacy efforts at the federal level to eliminate the current co-pay Medicare requires for mammography

and colonoscopy services. Cost should not be a barrier to effective cancer screening. Additionally, since January 1, 2005, Medicare has covered an initial preventive physical exam for all new Medicare beneficiaries within six months of enrolling in Medicare. Physician recommendation has been shown to be a critical factor for patients in deciding to get screening tests.^{99,222} The “Welcome to Medicare” visit, in addition to measurements of height, weight, and blood pressure, provides an opportunity for physicians to encourage new enrollees to utilize prevention and early detection services already covered under Medicare, such as colorectal cancer screening. The Society and ACS CAN are fighting to extend the current time limit on the Welcome to Medicare Visit from six months to one year. The time expansion will give beneficiaries more time to realize they have this benefit and give doctors enough time to fit an in-depth visit into their schedules.

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 works as a catalyst to stimulate key member organizations to

Table 4F. Colorectal Cancer Screening, Adults 50 and Older, by State, US, 2006

	% Recent Fecal Occult Blood Stool Test*					% Recent Sigmoidoscopy or Colonoscopy†					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	15.3	14.4	16.6	8.0	7.7	49.9	42.8	59.7	25.8	26.2	54.5
Alaska	10.5	9.0	14.6	2.7	8.9	49.0	45.8	58.0	33.8	25.8	51.4
Arizona	18.9	15.2	23.4	8.2	7.3	53.3	45.8	62.6	28.9	29.1	59.0
Arkansas	15.4	13.7	17.7	10.2	8.8	48.0	42.0	55.8	24.2	19.0	52.7
California	15.5	12.1	20.7	4.1	1.8	53.9	47.3	64.2	21.5	8.0	57.8
Colorado	18.8	16.4	23.0	7.2	8.6	53.1	48.3	61.5	19.3	18.0	59.1
Connecticut	18.0	15.6	21.2	2.9	7.6	66.2	62.4	71.4	38.5	42.8	69.7
Delaware	14.4	13.1	16.1	11.2	7.1	65.7	60.8	72.4	38.7	38.5	69.1
Dist. of Columbia	22.5	19.6	26.6	8.0	9.1	62.0	54.3	72.5	40.7	30.9	65.6
Florida	21.9	17.2	26.9	9.9	9.4	56.1	47.8	64.7	30.8	25.7	61.6
Georgia	17.8	16.2	20.5	10.7	11.7	53.9	47.9	63.9	24.6	27.8	58.5
Hawaii	19.1	17.7	21.0	4.0	7.3	50.0	42.8	60.1	18.9	21.8	54.7
Idaho	13.3	11.4	16.1	5.1	7.3	50.1	42.2	61.9	24.5	14.8	54.5
Illinois	12.8	9.9	16.9	6.0	8.7	51.9	44.6	62.1	22.3	23.9	55.8
Indiana	13.3	10.9	16.6	8.6	6.5	52.0	44.9	62.1	23.1	20.9	55.8
Iowa	15.5	13.8	17.6	3.3	4.5	51.8	45.3	60.2	15.2	17.7	57.0
Kansas	16.6	13.1	21.3	5.9	4.3	51.7	46.4	58.7	16.1	17.5	57.2
Kentucky	13.4	11.4	16.4	6.3	5.6	55.8	52.4	60.9	33.1	28.8	58.7
Louisiana	16.7	14.4	20.3	10.4	10.5	46.6	41.0	55.0	22.4	22.9	52.5
Maine	22.4	19.2	26.9	5.3	9.6	60.8	56.7	66.6	23.1	27.7	66.9
Maryland	19.0	16.2	23.2	8.5	7.1	63.0	58.0	70.6	34.5	31.4	66.9
Massachusetts	18.6	14.5	24.0	3.5	6.9	63.5	58.8	69.7	24.9	23.3	66.9
Michigan	17.6	15.6	20.5	7.3	8.6	61.7	57.3	68.0	29.5	28.0	65.7
Minnesota	14.5	10.9	19.8	4.7	4.3	66.2	60.4	74.7	37.8	24.5	68.6
Mississippi	14.6	11.5	19.0	7.0	8.0	46.6	41.4	54.0	21.1	23.5	50.6
Missouri	13.0	11.0	15.7	6.3	5.1	53.9	49.0	60.6	19.7	25.0	58.5
Montana	17.6	16.5	19.2	8.2	6.7	48.5	40.1	61.3	25.9	18.0	55.0
Nebraska	18.1	14.7	22.5	8.4	7.5	47.8	42.2	54.9	21.1	22.8	54.9
Nevada	17.5	14.8	21.6	8.5	5.1	48.6	44.8	54.4	19.7	19.6	53.1
New Hampshire	19.6	15.7	25.7	9.7	11.3	61.5	57.3	68.0	22.1	23.5	66.1
New Jersey	14.3	11.3	18.4	5.3	7.4	55.2	50.5	61.4	28.9	24.8	59.0
New Mexico	13.0	10.8	16.4	4.9	6.6	49.0	43.1	57.8	23.0	23.1	53.5
New York	15.1	13.5	17.4	6.7	12.7	60.7	56.3	66.6	26.8	31.4	64.0
North Carolina	20.7	17.6	25.0	6.7	11.3	58.8	54.2	65.3	28.5	30.7	64.0
North Dakota	15.1	13.0	17.7	8.0	13.3	51.9	43.3	62.7	28.8	26.2	56.0
Ohio	15.6	13.7	18.2	7.6	14.9	53.5	48.1	61.3	24.3	38.0	57.7
Oklahoma	13.0	10.8	16.0	8.1	9.4	47.1	40.6	56.0	16.2	20.9	51.2
Oregon	18.8	15.9	23.2	6.6	5.7	57.0	49.8	67.7	26.3	25.1	61.6
Pennsylvania	14.1	10.4	18.6	4.0	10.6	55.2	50.9	60.3	26.0	35.2	59.5
Rhode Island	17.5	14.3	21.6	7.8	11.0	66.4	61.9	72.2	32.8	33.0	69.2
South Carolina	14.5	13.4	16.1	11.1	8.4	56.0	50.4	63.9	25.5	33.9	60.0
South Dakota	14.4	11.5	17.7	7.4	6.1	52.7	44.3	62.5	29.1	28.0	57.1
Tennessee	15.7	13.7	18.7	10.2	9.0	53.4	49.4	59.4	24.4	31.6	57.9
Texas	13.5	11.6	16.5	4.6	7.3	52.2	45.1	63.6	28.6	21.7	55.8
Utah	6.6	5.1	8.9	2.1	2.5	59.3	53.5	67.9	35.8	28.5	60.7
Vermont	16.8	13.6	21.7	10.1	11.6	62.0	57.7	68.8	22.7	31.1	66.6
Virginia	16.3	13.9	20.1	8.6	5.6	62.6	57.5	71.0	27.5	35.5	65.1
Washington	20.5	17.2	25.7	7.3	9.5	59.4	53.3	69.4	29.1	26.0	64.0
West Virginia	18.6	17.0	20.6	11.9	16.4	49.7	45.6	55.0	26.5	23.3	56.1
Wisconsin	12.6	10.0	16.0	2.6	6.1	60.3	55.1	67.4	23.4	39.2	63.3
Wyoming	12.8	12.2	13.8	5.9	7.9	47.9	41.3	58.5	27.4	17.8	52.2
United States#	16.1	13.4	20.0	6.6	7.9	55.6	49.8	63.8	26.0	24.5	59.8
Range	6.6-22.5	5.1-19.6	8.9-26.9	2.1-11.9	1.8-16.4	46.6-66.4	40.1-62.4	54.0-74.7	15.2-40.7	8.0-42.8	50.6-69.7

*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 2006, National Center for Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2007.

act earlier, more effectively, and collaboratively in the area of colorectal cancer. 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. Many of these projects, such as the creation of the blue star symbol to signify the fight against colon cancer, the development of a colorectal cancer Clinician's Guide and Toolbox, and the development of a study designed to measure how increasing screening rates in individuals aged 50 to 54 will decrease Medicare colorectal cancer costs, and fill a key need among collaborating partners. Such initiatives enhance the efforts of each member organization, including the Society, and create a multiplier effect in the community's work against the disease.

- The CDC's Screen for Life awareness campaign helps educate the public and health care providers about the importance of colon cancer screening.²²³ In addition, the CDC conducts research on the nationwide capacity for colorectal cancer screening and strategies to increase use of screening rates. The CDC works with its national partners, including the Society, to raise colorectal cancer awareness.
- The American Cancer Society has launched an aggressive outreach effort to health care providers to remind them about their crucial role in getting patients screened for colorectal cancer. This outreach includes advertisements in medical journals, a direct email campaign, and working with health plans to reach their contracted providers. More information on health professional tools is available at www.cancer.org/docroot/PRO/PRO_4_ColonMD.asp.
- The American Cancer Society has ongoing advertising campaigns to raise awareness and to encourage consumers to talk with their doctors about colorectal cancer testing. In addition, the Society has developed an information resource kit to help consumers discuss with their physicians various colorectal cancer screening options 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 2005* (available at www.cancer.org/docroot/STT/content/STT_1x_Colorectal_Cancer_Facts_and_Figures_-_Special_Edition_2005.asp). To find out more about how getting tested for colorectal cancer saves lives, go to www.cancer.org/docroot/COM/content/div_OH/COM_1_1x_2006_Getting_Testing_for_Colorectal_Cancer_Saves_Lives.asp?sitearea=COM.

Prostate Cancer Screening

Among US men, cancer of the prostate is the most common type of cancer (other than skin cancer) and the second leading cause of cancer death. Although declining mortality trends for prostate cancer suggest that early detection using the prostate-specific antigen test (PSA) or digital rectal exam (DRE) may be beneficial, most experts agree that the current evidence is insufficient to recommend for or against population screening for prostate cancer in average risk men.¹⁷⁰ The US Preventive Services Task Force, the American Cancer Society, the American Academy of Family Physicians, the American College of Physicians-American Society of Internal Medicine, the American Medical Association, and the American Urological Association recommend that clinicians and patients decide whether to be tested for early prostate cancer detection after discussing the potential benefits and possible harm of PSA screening and individual patient preferences.^{170,224,225} The American Cancer Society recommends that men aged 50 and older be informed about the benefits and limitations of testing for early prostate cancer detection so that they can make an informed decision. Men at high risk, including men of African descent and men with a first-degree relative diagnosed with prostate cancer at a young age, should begin screening at age 45, but also should undergo the process of shared decision making described above prior to making a decision about testing.

Prevalence of Prostate Testing in the US

- According to the 2005 NHIS, the prevalence of having a PSA test in men aged 50 and older within the past year was 40.7% (Table 4G).
- Among men aged 50 and older, the least likely to have a PSA test were those who had no health insurance (12.5%), followed by those with less than a high school education (28.6%) (Table 4G).
- Based on the 2000 NHIS, among men who reported testing for early prostate cancer detection, 67% of men aged 50 to 74 years old 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.²²⁶

State-level Prostate Cancer Screening

- Across states (Table 4H), the prevalence of recent PSA testing in 2006 for men aged 50 and older ranged from 41.6% in Hawaii to 62.4% in Delaware. The recent DRE percentages in 2006 for men aged 50 and older ranged from 35.5% in Hawaii to 68.8% in Rhode Island. For both

Table 4G. Prostate Cancer Screening, Men 50 and Older, US, 2005

Characteristic	% PSA in the past year**†
Race/ethnicity	
White (non-Hispanic)	42.9
African American (non-Hispanic)	33.5
Hispanic/Latino	29.7
American Indian/Alaska Native†	44.9
Asian§	29.6
Education (years)	
11 or fewer	28.6
12	37.2
13 to 15	44.4
16 or more	49.8
Health insurance coverage	
Yes	42.3
No	12.5
Immigration**	
Born in US	42.2
Born in US Territory†	25.1
In US less than 10 yrs†	34.1
In US 10+ years	30.0
Total	40.7

*Percentages are age-adjusted to 2000 US standard population. See Statistical Notes for more information. †A prostate-specific antigen test within the last year for men 50 and older who did not report that they had ever been diagnosed with prostate cancer. Note: The 2005 estimate for PSA screening is not comparable to estimates from 2003 and prior. In 2005, questions assessing PSA screening were asked among all men 40 or older who reported ever having heard of a PSA test. ‡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 2005, National Center for Health Statistics, Centers for Disease Control and Prevention, 2006.

American Cancer Society, Surveillance Research

of these tests, use is greater among men 65 and older than in those 50 to 64 years old. Across all states, men aged 50 years and older who lack a usual source of care and uninsured men aged 50-64 years were significantly less likely to have had a recent PSA or a DRE.

Cancer Screening Obstacles and Opportunities to Improve

People who lack health insurance have less access to preventive care and are less likely to get timely cancer screening examinations.²²⁷ Furthermore, studies have shown that those who lack health insurance are more likely to be diagnosed at an advanced stage of cancer, when treatment is more expensive and survival rates are much lower.^{180,227}

In persons aged 65 and older, health insurance coverage is nearly universal because of the Medicare program.^{214,228} In 2006, 19.8% of adults aged 18 to 64 had no health insurance coverage.²²⁹ As a group, uninsured adults are more likely to have a lower income, to be Hispanic or African American, or have less education.²³⁰ Among adults 18 to 64, it is estimated that 8% had Medicaid coverage and 64.2% had employer-sponsored coverage.²³¹ Even among the employed, changes in employment status can also affect health care coverage.²²⁸ Despite recent efforts to expand coverage, the number of uninsured Americans grew to nearly 47 million in 2006, an increase of 7.2 million since 2001.^{230,232,233} Millions more face shrinking coverage, higher deductibles, and periods without insurance.^{230,233} According to a recent report, higher-wage workers are more likely than their lower-paid counterparts to have health insurance and health-related benefits, such as paid sick leave and 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.^{99,234,235}

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.^{99,236} Studies have shown that people who received a clinician’s recommendation for cancer screening are more likely to be screened than those who did not receive a recommendation.⁹⁹ 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.^{99,237} 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.²³⁸

Table 4H. Prostate Cancer Screening, Men 50 and Older, by State, US, 2006

	% 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	53.9	48.0	64.3	26.0	¶	42.4	37.1	51.6	12.8	¶
Alaska	43.8	41.8	51.4	20.5	¶	44.0	41.3	52.7	19.9	¶
Arizona	56.6	50.1	66.0	32.2	37.1	51.0	44.4	60.7	22.8	33.0
Arkansas	53.5	48.1	62.2	20.2	29.8	47.8	43.0	55.4	18.7	24.6
California	48.6	42.2	61.0	20.0	26.1	46.3	42.9	53.0	19.5	14.2
Colorado	55.9	53.7	60.5	24.6	27.9	51.2	49.5	55.0	27.5	23.8
Connecticut	55.6	49.9	66.4	18.5	34.7	60.3	56.0	68.5	18.2	32.9
Delaware	62.4	54.8	74.7		¶	58.7	51.0	71.4	¶	¶
Dist. of Columbia	55.2	49.9	65.2	23.8	¶	58.4	56.4	62.1	28.3	¶
Florida	60.7	53.6	69.8	26.5	26.0	52.4	48.2	57.8	27.7	25.8
Georgia	57.4	52.7	67.7	26.0	30.9	51.8	49.8	56.1	25.7	35.8
Hawaii	41.6	36.4	50.2	10.3	7.5	35.5	33.1	39.7	11.5	12.5
Idaho	52.0	47.6	60.3	29.5	16.8	46.4	42.9	53.4	24.6	18.2
Illinois	52.8	46.5	64.7	13.0	33.5	48.0	43.0	57.4	14.5	32.9
Indiana	50.5	42.9	64.5	30.7	20.7	43.7	38.1	54.2	22.5	18.1
Iowa	51.1	44.8	62.0	25.4	¶	47.5	43.9	53.5	20.7	¶
Kansas	55.2	47.2	68.5	21.9	20.5	49.4	43.9	58.8	15.7	17.8
Kentucky	51.0	46.3	60.3	22.7	13.8	45.2	41.8	51.9	22.9	11.6
Louisiana	53.1	49.5	60.1	27.6	25.9	39.9	35.8	47.8	16.6	15.4
Maine	49.6	47.6	53.0	19.6	24.7	59.9	58.7	61.9	17.9	29.0
Maryland	57.1	51.3	67.9	28.9	22.4	56.4	49.8	69.1	23.9	23.5
Massachusetts	55.9	51.7	63.6	27.7	29.0	59.5	56.6	64.5	21.0	9.7
Michigan	59.3	56.8	64.3	22.8	17.2	54.8	52.6	59.1	21.2	11.0
Minnesota	53.3	46.3	67.1	25.0	¶	53.7	50.1	60.6	27.0	¶
Mississippi	53.1	49.5	59.7	27.7	38.7	46.8	43.5	52.7	22.4	30.1
Missouri	51.3	43.7	64.8	21.7	19.9	43.3	39.2	50.5	16.8	15.3
Montana	56.7	53.9	61.8	28.9	27.8	54.4	49.9	62.8	32.3	29.5
Nebraska	53.4	46.9	64.4	17.7	24.0	46.3	41.3	54.7	18.5	15.5
Nevada	52.6	42.5	72.4	17.9	16.4	40.2	34.5	50.7	9.6	16.2
New Hampshire	53.3	47.0	66.0	19.9	19.0	61.1	57.7	68.0	30.0	26.0
New Jersey	58.0	52.4	68.1	27.0	23.9	48.5	43.1	58.3	25.0	17.5
New Mexico	46.3	41.8	54.4	19.4	20.0	43.1	40.9	47.2	15.6	22.1
New York	53.6	49.1	61.9	26.7	25.9	50.1	45.7	58.4	24.1	24.2
North Carolina	56.1	50.5	66.8	22.4	30.5	56.0	53.7	60.4	26.5	34.9
North Dakota	49.2	43.3	59.6	33.7	33.7	47.0	44.4	51.6	31.6	26.0
Ohio	58.4	55.4	64.1	14.9	32.1	57.8	57.7	58.1	20.5	33.0
Oklahoma	49.2	44.9	56.7	21.6	21.0	41.0	37.7	46.9	18.9	19.4
Oregon	49.6	42.8	62.2	17.0	20.1	49.0	44.5	57.5	14.9	21.1
Pennsylvania	52.8	47.6	61.0	28.1	36.1	51.0	46.2	58.7	18.7	25.6
Rhode Island	61.9	59.2	66.8	22.5	¶	68.8	67.2	71.7	35.3	¶
South Carolina	54.4	49.0	64.0	23.0	26.7	49.1	43.1	59.9	24.2	24.7
South Dakota	55.1	49.3	64.1	33.6	25.8	50.2	45.7	57.5	29.5	21.8
Tennessee	52.3	48.7	59.4	30.0	41.3	48.5	46.5	52.7	34.7	35.9
Texas	54.5	52.0	59.5	32.0	30.4	49.6	45.2	58.9	26.4	17.3
Utah	47.8	42.0	58.7	27.6	38.9	43.5	40.7	48.8	20.1	37.2
Vermont	47.3	43.1	55.6	14.7	26.8	52.0	50.2	55.5	16.6	28.4
Virginia	53.9	47.0	67.4	27.0	27.1	53.3	50.4	59.1	21.0	28.2
Washington	48.3	43.1	58.8	13.5	18.3	49.8	46.5	56.6	17.1	18.8
West Virginia	53.9	49.2	61.6	23.3	¶	45.4	41.0	52.8	23.2	¶
Wisconsin	47.6	41.7	58.1	15.8	26.1	48.4	44.5	55.2	18.3	32.2
Wyoming	59.3	55.2	67.7	31.1	38.1	38.6	35.9	44.0	15.4	26.6
United States#	53.8	48.5	63.4	24.0	27.0	50.0	46.2	56.9	22.1	22.5
Range	41.6-62.4	36.4-59.2	50.2-74.7	10.3-33.7	7.5-41.3	35.5-68.8	33.1-67.2	39.7-71.7	9.6-35.3	9.7-37.2

*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 2006, National Center for Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2007.

American Cancer Society, Surveillance Research



Efforts among the American Cancer Society and government agencies are under way to implement interventions, integrate screening into routine care, and address health disparities. Visit www.cdc.gov/nccdphp/publications/aag/reach.htm for more information.

On April 20, 2007, President George W. Bush signed into law legislation to expand the National Breast and Cervical Cancer Early Detection Program Reauthorization Act of 2007 (S.624/H.R. 1132) during National Minority Cancer Awareness Week, following passage in the US House and Senate with strong bipartisan support. The legislation reauthorizes this program, which is administered by the CDC and gives some states greater flexibility to reach more eligible women. Moreover, the law sets increased funding targets for the program from \$202 million currently to \$275 million over the next five years, allowing it to serve an additional 130,000 women. At current funding levels, the program can serve only one in five eligible women. The Society and ACS CAN are working to secure funding to expand the NBCCEDP program.

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

Statistical Notes

Sample Surveys

In measuring the prevalence of certain behaviors in a population, it is usually costly and unfeasible to survey every person. Hence, most population-based surveys are conducted by choosing a randomly selected sample of people to estimate the true prevalence in a population. Such surveys are considered to have high external validity. 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 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, data group A targets adults 18 and older, and data group B 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, study A is designed to represent all residents in a given state, and study B is designed to represent all high school students in the US, a state, or a city.

Sample: A smaller group of people chosen from the population defined by the survey. The sample is chosen based on the age, race, ethnic, and gender demographics of the city, state, or nation. At times, population-based surveys will over-sample a particular age, race, ethnic, or gender group. This over-sampling 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 population (city, state, or nationwide). For example, study A data in this publication are representative of all non-institutionalized, civilian adults with telephones. Study B 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 (17.1%, 0.7%) or (16.4, 17.8), and the percentage for Alaska has the widest range of possible values (24.2%, 2.7%) or (21.5, 27.5).

Correlation: Correlation quantifies the extent to which two independent quantities (variables 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 CDC will differ from these. Because of the differences in sampling methodology and survey methods, this percentage may not be the same as the percentage reported by the NHIS.

Confidence Interval (CI) Ranges for Percentages Listed in Tables, by State, CPED 2008

Table	Description	95% CI Range
1A	Current cigarette smoking, high school students, total	± 1.6% to 7.6%
2A	At risk for becoming overweight, high school students, total	± 1.2% to 2.9%
	Overweight, high school students, total	± 1.0% to 2.9%
	Met currently recommended levels of physical activity, high school students, total	± 1.6% to 4.9%
	Ate fruits and vegetables five or more times a day, high school students, total	± 1.3% to 4.5%
1B	Current cigarette smoking, adults aged 18 years and older	± 0.7% to 2.7%
	Current cigarette smoking, men aged 18 years and older	± 1.2% to 4.1%
	Current cigarette smoking, women aged 18 years and older	± 0.8% to 3.5%
2B	Clinical overweight, adults aged 18 years and older	± 0.9% to 3.0%
	Clinical obese, adults 18 and older	± 0.8% to 2.7%
	No leisure time physical activity, adults 18 and older	± 0.7% to 2.4%
	Moderate physical activity, adults 18 and older	± 0.9% to 2.9%
	Vigorous physical activity, adults 18 and older	± 0.8% to 2.8%
	Eating five or more fruits and vegetables a day, adults aged 18 years and older	± 0.7% to 2.3%
4B	Recent mammogram, women aged 40 years and older	± 1.2% to 4.9%
	Recent mammogram, women aged 65 years and older	± 1.9% to 10.0%
4D	Recent Pap test, women aged 18 years and older	± 1.1% to 3.7%
	Recent Pap test, women aged 65 years and older	± 2.7% to 11.6%
4F	Recent fecal occult blood test, adults aged 50 years and older	± 1.1% to 4.8%
	Recent sigmoidoscopy or colonoscopy, adults aged 50 years and older	± 0.9% to 2.9%
4H	Recent prostate-specific antigen test, men aged 50 years and older	± 1.9% to 7.5%
	Recent digital rectal examination, men aged 50 years and older	± 1.9% to 7.3%

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, a 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, conducted by the CDC National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP), of 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 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 <http://www.cdc.gov/brfss/>.

National Health and Nutrition Examination Survey (NHANES). The NHANES is a survey conducted by the CDC National Center for Health Statistics (NCHS). The survey is designed to provide national prevalence estimates on the health and nutritional status of US adults and children, such as prevalence of major diseases, nutritional disorders, and potential risk factors. Data are gathered through in-person interviews and direct physical exams in mobile examination centers. Questions regarding diet and health are asked in the interview. The physical exam consists of medical and dental exams, physiological measurements, and laboratory tests. Three cycles of NHANES were conducted between 1971 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 <http://www.cdc.gov/nchs/nhanes.htm>.

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

Youth Risk Behavior Surveillance System (YRBSS). The YRBSS is a survey conducted by the CDC National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP). The survey is designed to provide national, state, and local prevalence estimates on health risk behaviors, such as tobacco use, unhealthy dietary behaviors, physical inactivity, and others among youth and young adults who attend public and private high schools. Different statistical methods are used to choose the representative sample for the national, state, and local prevalence estimates. (See Statistical Notes, page 46.) Data are gathered through a self-administered questionnaire completed during a required subject or class period. The YRBSS is a biennial survey that began in 1991. The state and local surveys are of variable data quality, and caution should be used in comparing data among them. Data from states and local areas with an overall response rate of 60% and appropriate documen-

tation 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 <http://www.cdc.gov/HealthyYouth/yrebs/index.htm>.

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