2001

CANCER PROGRESS REPORT

U.S. Department of Health and Human Services
Public Health Service
National Institutes of Health
National Cancer Institute

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Director's Message

The beginning of a new century is a fitting time to take stock of our Nation's progress against cancer and to establish a readily accessible, authoritative tool to track this progress over time. The National Cancer Institute's (NCI) *Cancer Progress Report 2001* aims to do just that. This report tracks progress, or lack of it, across the full cancer continuum—from prevention and early detection to diagnosis, treatment, life after cancer, and the end of life. It also compares this progress with the cancer-related targets set forth in the Department of Health and Human Services' Healthy People 2010, the national set of health objectives for the first decade of the 21st century.

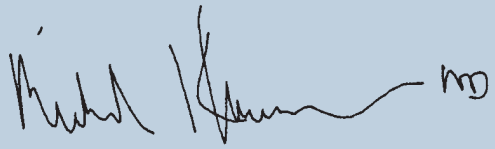
As a national report, *Cancer Progress Report 2001* goes beyond the work of NCI. It also reflects efforts by other Federal agencies, foundations, and State and local governments and health departments, as well as medical providers and researchers, cancer patients and advocates, and all those concerned with making cancer an uncommon and easily treated disease.

The main message of this report is that, overall, the Nation is making progress against cancer. In the last decade, for the first time since we have been keeping records of cancer statistics, the rates of both new cancers and deaths from cancer have fallen. Behind the numbers are declines in certain behaviors that cause cancer, especially cigarette smoking by adults. More people are getting screened for breast, cervical, and colorectal cancers, and more practitioners are adopting state-of-the-art cancer treatments. Some of these favorable trends are modest and need to be accelerated—for example, the still distressingly low rates of colorectal cancer screening.

Much work remains if we are to meet the Healthy People 2010 targets. In some areas, we are making no progress or even losing ground. The rates of some cancers, such as melanoma skin cancer, are rising and need attention. Greater efforts also are needed to reduce tobacco use, weight gain, and sun exposure, and to increase physical activity. It also is critical that we develop better measures of progress, especially for cancer treatment and quality of cancer care.

Finally, some racial and ethnic groups and disadvantaged people continue to suffer an unequal burden of cancer. For example, Blacks have higher overall rates of new cancers and deaths from cancer than any other group. We must redouble our efforts to eliminate these cancer-related health disparities.

Although the *Cancer Progress Report* is filled with data, it is not just about the numbers. Behind every number are people. This report is about cancer patients and survivors, their families, communities, and those at risk of getting cancer. Taking control of cancer—through research and its dissemination and application—includes giving millions of people the chance to take greater control over their own lives.



Richard D. Klausner, M.D.
Director
National Cancer Institute
1995-2001

Highlights

Cancer Progress Report 2001 is the first in a new series of reports to describe progress in reducing the U.S. cancer burden through cancer research and its dissemination.

Major Conclusions

The Nation is making progress toward major cancer-related Healthy People 2010 targets.

- The rates of both new cancer cases and cancer deaths are falling overall.
- Some prevention behaviors have shown improvement. Adult smoking is down dramatically since the 1960s, although rates fell only slightly in the 1990s. Alcohol and fat consumption is headed down, while fruit and vegetable consumption is up.
- The use of screening tests for breast, cervical, and colorectal cancers is increasing. Screening for colorectal cancer, however, remains low.

The Nation is losing ground in other important areas that demand attention.

- Some cancers are rising dramatically, such as cancer of the esophagus and melanoma skin cancer. Lung cancer in women continues to rise, but not as rapidly as before.
- Youth smoking has been on the rise, though data show there may be a recent, promising decline.
- People are doing less to protect themselves from the sun.
- More people are overweight and obese, and physical activity is increasing only slightly.
- Cancer treatment spending continues to rise along with total health care spending.
- Unexplained cancer-related health disparities remain among population subgroups. For example, Blacks and people with low socioeconomic status have the highest overall rates for both new cancers and deaths.

What's in This Report

Cancer Progress Report 2001 includes key measures in the areas of prevention, early detection, diagnosis, life after cancer, and end of life. These are based on scientific evidence and, in most cases, are products of long-term national data collection efforts. We have included the most recent data available from the National Cancer Institute (NCI), the Centers for Disease Control and Prevention, and other Federal agencies, professional groups, and cancer researchers.

The *Progress Report* tracks progress over time, usually beginning in 1990 and up to the most recent data available. This progress is then measured against certain cancer-related targets of Healthy People 2010: a comprehensive set of 10-year national health objectives developed through a public-private effort sponsored by the U.S. Department of Health and Human Services (of which NCI is a part). These targets reflect where the Nation should be in 10 years relative to where we are now. In preparing this *Progress Report*, NCI used only those HP 2010 cancer-related targets that reflect measures for which long-term data are available.

The *Cancer Progress Report* is not an official government assessment of progress toward Healthy People 2010 targets. These assessments will be published by the U.S. Department of Health and Human Services.

What's Not in This Report

Not all measures for all relevant areas of cancer progress could be included in this report. In some cases, trend information on a national level was not available. In other cases, there are no reliable numbers at this time. Regarding treatment measures, although dramatic advances have been made in the treatment of many cancers, we currently lack a national data system for tracking and assessing these successes over time. In the future, we intend to include more population-level measures like the one in this edition describing State laws on smoke-free air.

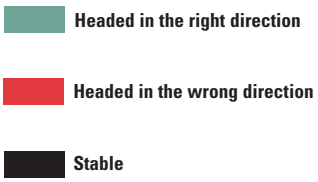
NCI and its partners are working hard to improve current measures and to develop new ones. Future editions of the *Cancer Progress Report* will reflect these developments.

How To Use the Summary Chart

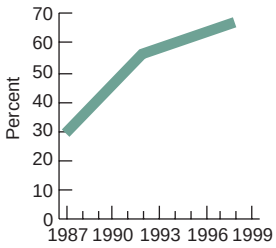
The following eight-page chart summarizes some of the measures that are described at greater length in the body of this report. Special graphics address two questions:

Is the trend good or bad?

- A graph shows the direction of the trend for each measure in the chart. Below the graph is an arrow showing the desired direction (up or down) of the trend.
- Each graph line is color-coded to indicate whether the trend is:



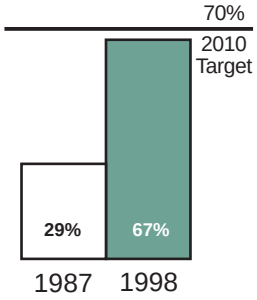
For example, this graph shows that mammography use is rising and that this is the desired direction.



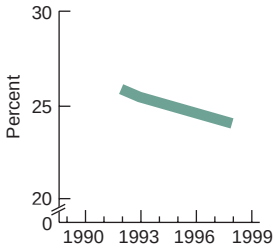
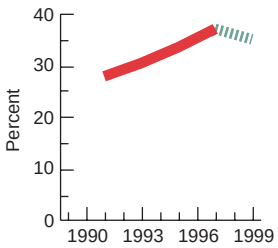
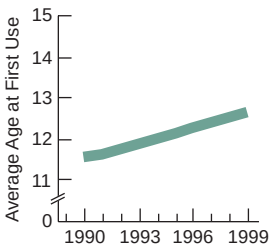
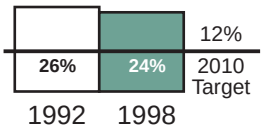
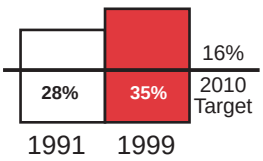
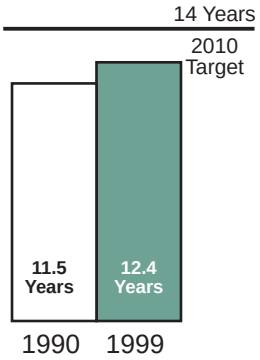
How does the Nation's progress compare to the Healthy People 2010 target?

- Progress toward the relevant Healthy People 2010 target is displayed by two bars—the first indicating where we started, and the second, where we are now.
- The first (baseline) bar is white. The second bar is either green or red, depending on the direction of the trend.
- A black horizontal line shows the Healthy People 2010 target.

For example, this bar chart shows that mammography use has increased from 29 percent in 1987 to 67 percent in 1998, a level close to the Healthy People 2010 target of 70 percent.



PREVENTION–Summary

	Adult Smoking	Youth Smoking	Age That Smoking Begins
Measure	Percent of adults who are current cigarette smokers (ages 18 and older)	Percent of high school students who are current cigarette smokers	Average age at first use of cigarettes (ages 12-17)
Period	1992-1998	1991-1999	1990 -1999
Trend	Falling slightly 	Rising 	Rising slightly 
Desired Direction	↓	↓	↑
Most Recent Estimate	1998: 24% of adults were current smokers.	1999: 35% of youth were current smokers.	1999: 12.4 was the average age 12- to 17- year-olds started smoking.
Target From Healthy People 2010 Report	12%	16%	14 years
Progress Relative to Healthy People 2010 Target			
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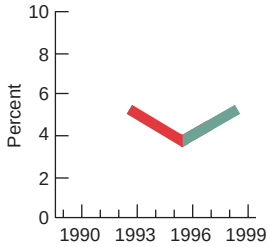
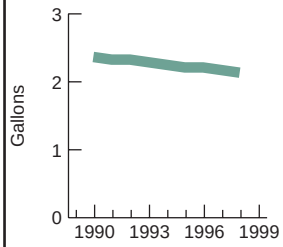
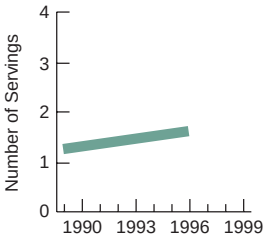
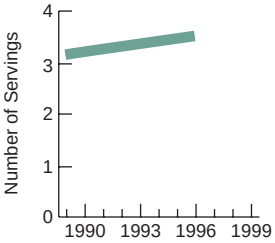
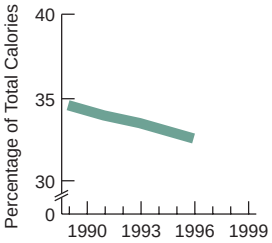
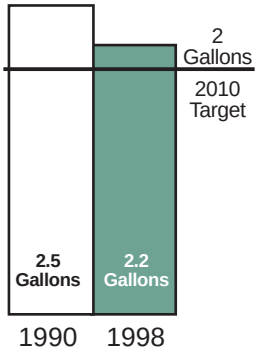
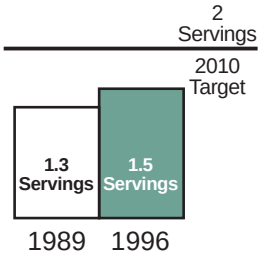
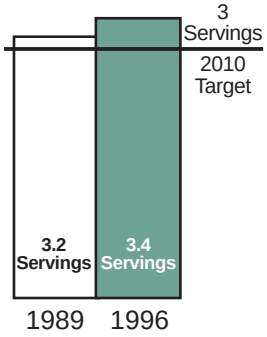
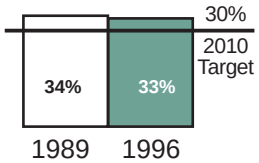
PREVENTION–Summary

Trends: Right direction | Wrong direction | Stable

Quitting Smoking	Alcohol	Fruits	Vegetables	Fats
Percent of daily cigarette smokers who were able to stay off cigarettes 3 months or longer (ages 25 and older)	Estimated gallons of alcohol drunk per person, per year (ages 14 and older)	Average daily servings (ages 2 and older)	Average daily servings (ages 2 and older)	Intake of total fat as a percentage of total calories (ages 2 and older)
1992 -1999	1990 -1998	1989 -1996	1989 -1996	1989 -1996
Falling, then rising 	Falling slightly 	Rising 	Rising slightly 	Falling slightly 
↑	↓	↑	↑	↓
1998-1999: 5% of daily smokers quit for 3 months or longer.	1998: 2.19 gallons were consumed per person.	1994-1996: 1.5 daily servings were consumed.	1994-1996: 3.4 daily servings were consumed.	1994-1996: 33% of total calories came from fat.
This report uses data different from that used in Healthy People 2010.	2 gallons per year	At least 2 daily servings	At least 3 daily servings with at least 1/3 dark-green/deep-yellow	People should consume no more than 30% of daily calories from fat.
No comparison possible				
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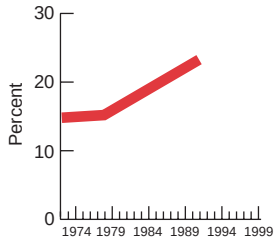
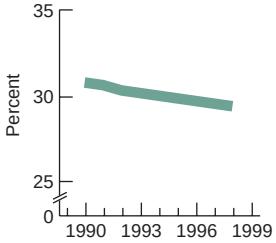
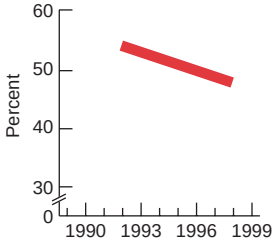
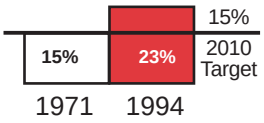
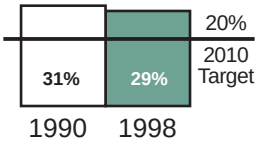
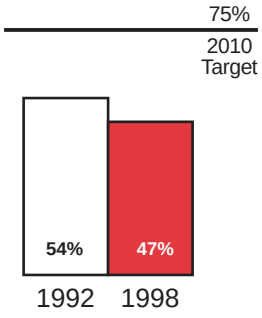
PREVENTION–Summary

	Weight	No Leisure-Time Physical Activity	Sun Protection
Measure	Percent of adults at a healthy weight, overweight, or obese (ages 20-74) (Example: Obese)	Percent of adults with no leisure-time physical activity during the past month (ages 18 and older)	Percent of adults very likely to protect themselves from the sun if outside for more than 1 hour (ages 18 and older)
Period	1971-1994	1990-1998	1992 and 1998
Trend	Rising slightly, then rising 	Falling slightly 	Falling 
Desired Direction	↓	↓	↑
Most Recent Estimate	1988-1994: 23% of adults were obese.	1998: 29% of adults had no leisure-time physical activity.	1998: 47% of adults were very likely to protect themselves from the sun.
Target From Healthy People 2010 Report	15%	20%	75%
Progress Relative to Healthy People 2010 Target			
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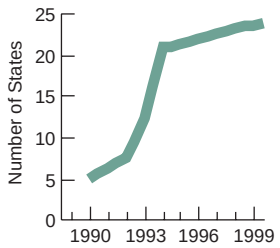
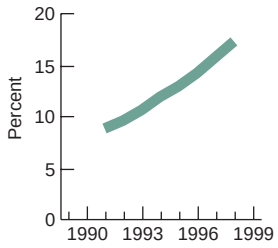
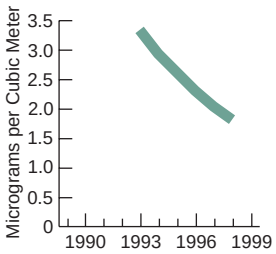
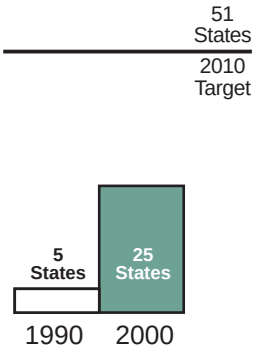
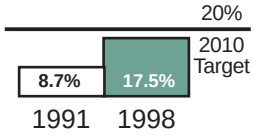
PREVENTION–Summary

Trends: Right direction | Wrong direction | Stable

Laws on Smoke-Free Air	Radon Testing	Benzene
States (and D.C.) with laws on smoke-free air for public places and worksites (Example: Day care centers)	Percent of U.S. population who heard of radon who lived in homes tested for radon	National yearly average concentrations of benzene in metropolitan areas, measured in micrograms per cubic meter (µg/m3)
1990-2000	1991-1998	1993-1998
Rising 	Rising 	Falling 
↑	↑	↓
2000: 25 States had smoke-free day care centers.	1998: 17.5% of Americans who heard of radon lived in homes tested for it.	1998: 1.85 µg/m3 of benzene were in the air in metropolitan areas.
51 States	20%	No target
		No comparison possible
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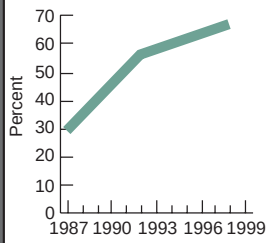
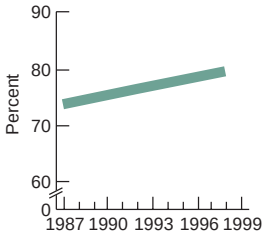
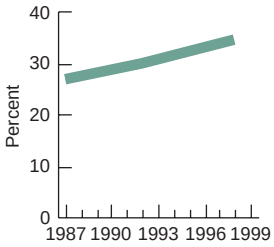
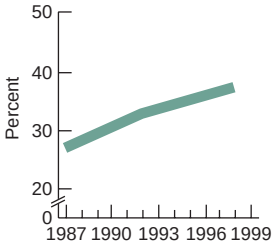
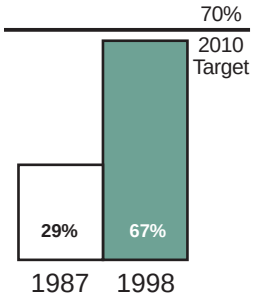
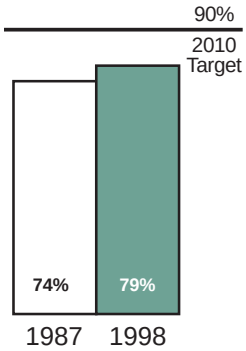
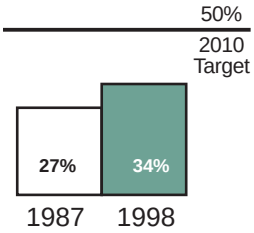
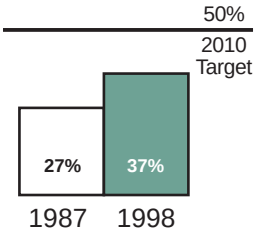
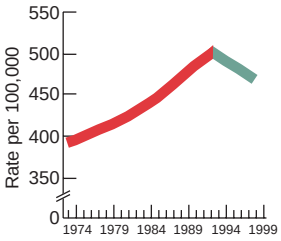
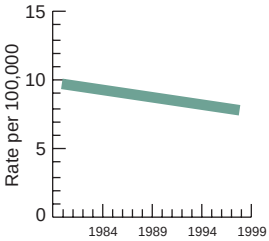
EARLY DETECTION–Summary

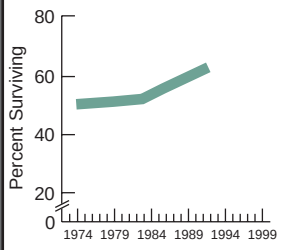
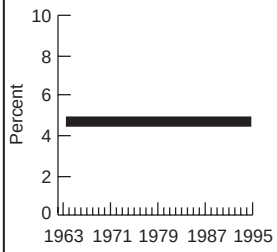
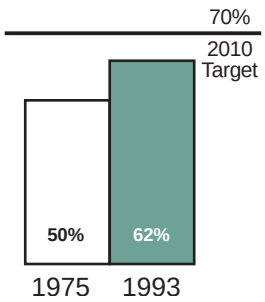
	Breast Cancer Screening	Cervical Cancer Screening	Colorectal Cancer Screening	
Measure	Percent of women who had a mammogram within the past 2 years (ages 40 and older)	Percent of women who had a Pap smear within the past 3 years (ages 18 and older)	Percent of adults who had a fecal occult blood test within the past 2 years (ages 50 and older)	Percent of adults who ever had a sigmoidoscopy (ages 50 and older)
Period	1987-1998	1987-1998	1987-1998	1987-1998
Trend	Rising 	Rising slightly 	Rising 	Rising 
Desired Direction	↑	↑	↑	↑
Most Recent Estimate	1998: 67% of women had a mammogram within the past 2 years.	1998: 79% of women had a Pap smear within the past 3 years.	1998: 34% of older adults had a fecal occult blood test within the past 2 years.	1998: 37% of older adults ever had a sigmoidoscopy.
Target From Healthy People 2010 Report	70%	90%	50%	50%
Progress Relative to Healthy People 2010 Target				
More Information	Page 45	Page 46	Page 47	Page 47

DIAGNOSIS–Summary

Trends: Right direction | Wrong direction | Stable

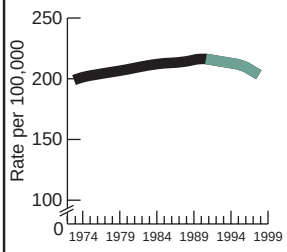
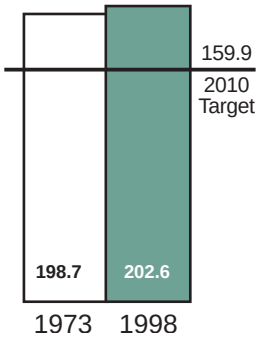
Incidence	Stage at Diagnosis
Number of new cancer cases per 100,000 people	New cancer cases that are diagnosed late, per 100,000 people (Example: Colon cancer)
1973 -1998	1980-1998
Rising, then falling slightly 	Falling slightly 
↓	↓
1998: 471 per 100,000 people were diagnosed with cancer.	1998: 7 per 100,000 people were diagnosed with colon cancer that had spread.
No target	No target
No comparison possible	No comparison possible
Page 50	Page 53

LIFE AFTER CANCER–Summary

	Survival	Costs of Cancer Care
Measure	Percent of cancer patients surviving cancer 5 years after their diagnosis	Cancer treatment spending as a percent of total U.S. treatment spending
Period	1975-1993	1963-1995
Trend	Rising 	Stable 
Desired Direction	↑	↓
Most Recent Estimate	1993: 62% of cancer patients survived cancer 5 years after their diagnosis.	1995: 4.7% of total U.S. treatment spending was for cancer treatment.
Target From Healthy People 2010 Report	70%	No target
Progress Relative to Healthy People 2010 Target		No comparison possible
More Information	Page 57	Page 59

END OF LIFE–Summary

Trends: Right direction | Wrong direction | Stable

Mortality	Person-Years of Life Lost
Number of cancer deaths per 100,000 people	The difference between the actual age of death due to a cancer and the expected age of death
1973-1998	1998
Stable, then falling slightly 	No trend data available
↓	↓
1998: 202.6 per 100,000 people died from cancer.	1998: 8 million person-years of life were lost due to cancer.
159.9 per 100,000	No target
	No comparison possible
Page 62	Page 65

Introduction

The Nation's investment in cancer research is making a difference:

- **Many people are adopting good health habits** that reduce the chances of getting cancer.
- **The rates of new cancers are going down.**
- **Overall, cancer death rates have dropped.**
- **Many people who have had cancer live longer,** with the opportunity to enjoy a better quality of life than was possible years ago.

Yet cancer remains a major public health problem—one that profoundly affects the more than 1 million people diagnosed each year, as well as their families and friends:

- **Not all cancer rates are going down.** For example, the rates of new lung cancers in females have continued to rise. The rates of new cases and deaths from non-Hodgkin's lymphoma also continued to rise, as have the rates of new cases of melanoma.
- **The burden of some types of cancer weighs more heavily on some groups than others.** The rates of both new cases and deaths from cancer vary by cancer site, socioeconomic status, sex, and racial and ethnic group.
- **The economic burden of cancer also is taking its toll.** As our Nation's population grows and ages, more people will get cancer. Meanwhile, the costs of cancer diagnosis and treatment are on the rise. The combination of these trends will accelerate the overall national costs of cancer treatment.

Why a Progress Report Is Needed

For the past 30 years, our country has vigorously fought the devastating effects of cancer. Now it is time to see how far we have come. *Cancer Progress Report 2001* is the first in a new series of reports to describe the Nation's progress against cancer through research and related efforts. The report is based on the most recent data from the National Cancer Institute, the Centers for Disease Control and Prevention, other Federal agencies, professional groups, and cancer researchers.

The *Cancer Progress Report* was designed to help policymakers review past efforts and plan future ones. The public can use the report to better

understand the nature and results of strategies to fight cancer. Researchers, clinicians, and public health providers can focus on the gaps and opportunities identified in the report, paving the way to future progress against cancer.

What's in the Report

Cancer Progress Report 2001 includes key measures of progress along the cancer continuum:

- **Prevention.** The measures in this section cover behaviors that can help people prevent cancer—the most important of which is not using tobacco. This section also covers exposures to chemicals in the environment.
- **Early Detection.** Screening tests are ways to find cancers early, when there is the best chance for cure. This section describes the proportion of people using recommended screening tests and who they are.
- **Diagnosis.** We can learn much about progress against cancer by looking at the rates of new cancer cases (incidence) and of cancers diagnosed at late stages. This section describes both.
- **Treatment.** Few treatment measures have been tracked at a national level. This section explains the current status of treatment measures and describes the kinds of measures that are emerging from ongoing research and monitoring activities.
- **Life After Cancer.** Trends in the proportion of cancer patients alive 5 years after their diagnosis and the costs of cancer care are addressed in this section.
- **End of Life.** This section includes the rate of deaths (mortality) from cancer and the estimated number of years of life lost (person-years of life lost) due to cancer.

Where possible, the *Cancer Progress Report* shows changes in these data over time (trends). Most of the trend graphs were made using a new statistical method that illustrates real changes in direction instead of merely connecting one dot to another. This report also shows whether the trends are "rising" or "falling" using standard definitions, and it explains why changes might have occurred (Appendix D). For some measures, differences in the cancer burden between some U.S. racial and ethnic groups also are presented. We were not able to present information on all demographic groups for all measures because of space limitations.

Introduction *(continued)*

Most of the measures in this report are identical to those in Healthy People 2010—a comprehensive set of 10-year health objectives for the Nation—sponsored by the U.S. Department of Health and Human Services. This enabled us to show the Nation's progress relative to Healthy People cancer-related targets for 2010.

How Data Were Selected

In selecting measures that would be meaningful to readers of this report, we relied on those that are based on scientific evidence and long-term national, rather than State or local, data collection efforts. The report includes more measures for prevention, because more data on trends are available in that area. Some measures such as "quality of life" were not included in this report, even though they are important in assessing the cancer burden, because there simply is no consensus on how best to track these measures at this time.

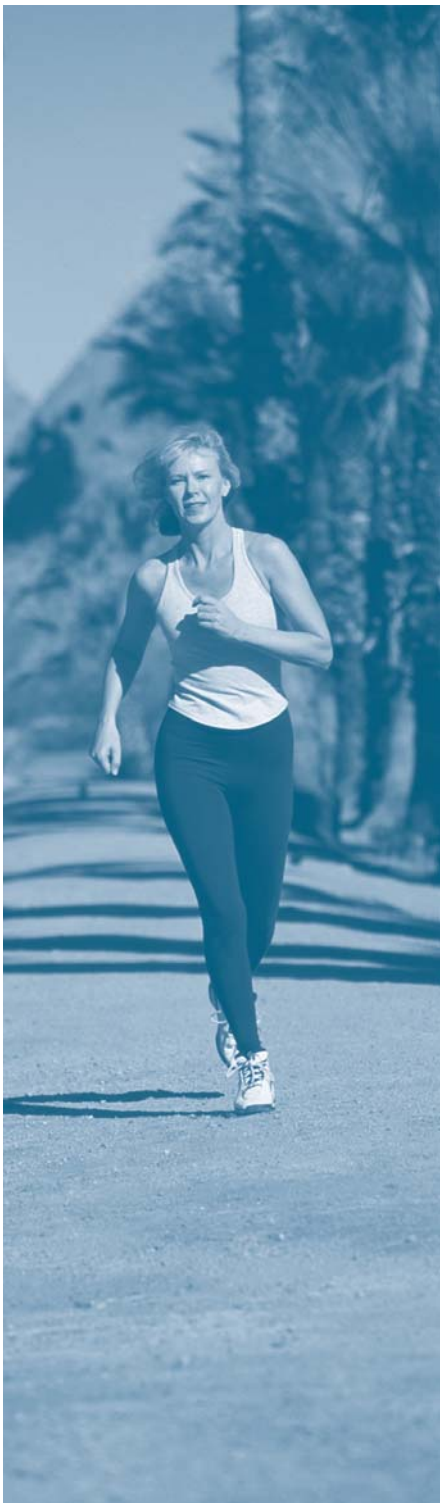
The data in *Cancer Progress Report 2001* come from a variety of systems and surveys with different collection techniques and reporting times, so time periods may vary. Where possible, 1990 was used as the starting point or baseline against which to measure how well the Nation is progressing toward the Healthy People 2010 targets.

Online Version

This report presents summary data in a concise manner so that many measures could be included. More detailed information on these and related topics can be found at: http://progressreport.cancer.gov.

The online version includes links to published reports, databases, articles, and other background information. Use the key words that appear throughout this printed report to locate information at the *Cancer Progress Report* site.

Prevention



This section of *Cancer Progress Report 2001* focuses on two kinds of factors that can affect a person's risk of getting cancer: behaviors and exposures to chemicals in the environment. Choosing the right behaviors and preventing exposures to certain chemicals may help to prevent cancers before they can start.

Behavioral Factors

Scientists estimate that as many as 50 percent to 75 percent of cancer deaths in the United States are caused by human behaviors such as smoking and dietary choices. The first part of the Prevention section describes trends in the following behaviors that can help to prevent cancer:

- Not using cigarettes or other tobacco products
- Not drinking too much alcohol
- Eating five or more daily servings of fruits and vegetables
- Eating a low-fat diet
- Maintaining or reaching a healthy weight
- Being physically active
- Protecting skin from sunlight

Smoking causes about 30 percent of all U.S. deaths from cancer. Avoiding tobacco use is the single most important step Americans can take to reduce the cancer burden in this country.

Additional important steps are maintaining a healthy weight, being physically active, eating a low-fat diet and enough fruits and vegetables, avoiding too much alcohol, and protecting skin from sunlight.

Environmental Factors

Certain chemicals in the environment are known to cause cancer. The second part of the Prevention section covers:

- Secondhand smoke (also known as environmental tobacco smoke)
- Radon in the home
- Benzene in the air

These environmental measures were chosen because of the availability of reliable national data showing trends over time. Additional environmental measures will be available for future editions of this report.

Key Words: Adult Smoking

Adult Smoking

Cigarette smoking by adults has fallen slightly since 1990.

Smoking and Cancer

Cigarette smoking is the most preventable cause of death in the United States. It causes nearly one-third (163,000) of all U.S. cancer deaths each year and is the leading cause of lung cancer deaths. Cigarette smoking also causes cancers of the larynx, mouth, esophagus, pharynx, and bladder. In addition, it plays a role in cancers of the pancreas, kidney, and cervix.

Cigar smoking has been found to cause cancers of the larynx, oral cavity (lip, tongue, mouth, and throat), esophagus, and lung.

Measure

Percent of adults who were current cigarette smokers: Adults ages 18 and older who reported smoking 100 or more cigarettes in their lifetime and who, at the time of the interview, continued to smoke every day or some days.

Period – 1992-1998

Trends – Falling slightly

Adult cigarette smoking is falling slightly for men and women and for both combined, although the trend for women is not statistically significant.

Most Recent Estimates

In 1998, 24 percent of adults—26 percent of men and 22 percent of women—were current cigarette smokers.

Also in 1998, 2.5 percent of adults—5 percent of men and 0.2 percent of women—were current cigar smokers, an increase from earlier in the decade. Current cigar smokers have had at least 50 cigars in their lifetime and, at the time of the interview, continued to smoke every day or some days.

Healthy People 2010 Targets

Reduce to 12 percent the proportion of adult current cigarette smokers.

Reduce to 1.2 percent the proportion of adult current cigar smokers.

Groups at High Risk for Smoking

Men—especially American Indian/Alaska Natives and Blacks—are more likely than women to smoke cigarettes. Other high-risk groups include American Indian/Alaska Native women, people living below the poverty level, and those with 9 to 11 years of education.

Key Words: Adult Smoking

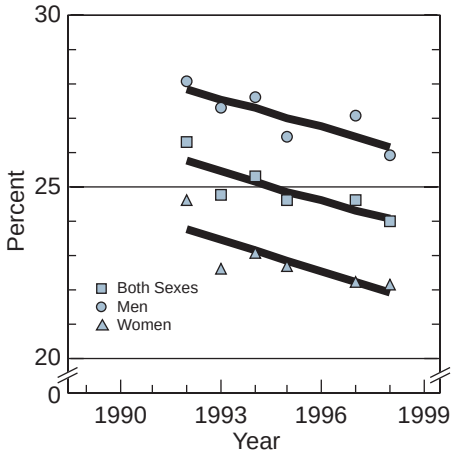
Cigar use is increasing among young and middle-aged (ages 18-44) White men with higher than average incomes and education, and among women.

Key Issues

Although the rate of smoking has dropped by nearly half since the Surgeon General's first report on smoking in 1964 (42 percent of adults were current smokers in 1965), progress has slowed in recent years. Further decreases in tobacco use could vastly improve the public's health.

From 1993 to 1997, U.S. cigar sales soared by almost 50 percent, mostly due to increased sales of large cigars. This followed new cigar marketing approaches that began in 1992.

Figure 1: Percent of Adults (Ages 18+) Who Were Current Cigarette Smokers—1992-1998



Source: Centers for Disease Control and Prevention, National Center for Health Statistics. National Health Interview Survey.
Age-adjusted to the year 2000 standard population.

Key Words: Youth Smoking

Youth Smoking

Cigarette smoking by high schoolers is rising, with recent suggestions of a turnaround. Smokeless tobacco use appears to be falling.

Youth Tobacco Use and Cancer

For most of the 1990s, about 3,000 youth under 18 became regular cigarette smokers each day. This has declined recently to just over 2,000 each day. Of these 2,000, nearly 700 will die early due to lung cancer or other tobacco-related diseases.

Other forms of tobacco used by young people include smokeless tobacco (chewing tobacco and snuff, also known as spit tobacco), cigars, and bidis (small, brown, hand-rolled, flavored cigarettes). Each of these also can cause cancer.

Measure

Percent of high school students who were current cigarette or smokeless tobacco users: Students (grades 9-12) who reported having used cigarettes or smokeless tobacco in the 30 days before the survey.

Period – 1991-1999

Trends

Cigarettes:
The data show that current cigarette smoking among youth is rising. There appears to be a downward trend beginning in 1997, but more data are needed before this can be verified.

Smokeless tobacco:
Current smokeless tobacco use is falling, although the trend is not statistically significant.

The source of trend data used in this report does not provide data for use of either "any tobacco" or cigars before 1997.

Most Recent Estimates

Among high school students in 1999:

- 35 percent were current cigarette smokers.
- 8 percent were current users of smokeless tobacco.
- 18 percent were current cigar smokers.
- 40 percent were current users of "any tobacco."

Healthy People 2010 Targets

Decrease the proportion of high school students who currently:

- Smoke cigarettes to 16 percent.
- Use smokeless tobacco to 1 percent.
- Smoke cigars to 8 percent.
- Use any tobacco to 21 percent.

Key Words: Youth Smoking

Groups at High Risk for Tobacco Use

White, non-Hispanic students are more likely to smoke cigarettes than are Hispanic students, who in turn are more likely to smoke than Black non-Hispanic students.

High school boys are much more likely than girls to use smokeless tobacco, cigars, pipes, and bidis. Overall, White high school students are much more likely than Black high school students to report current cigar use.

Among middle school students, Blacks are much more likely than Whites to smoke cigars.

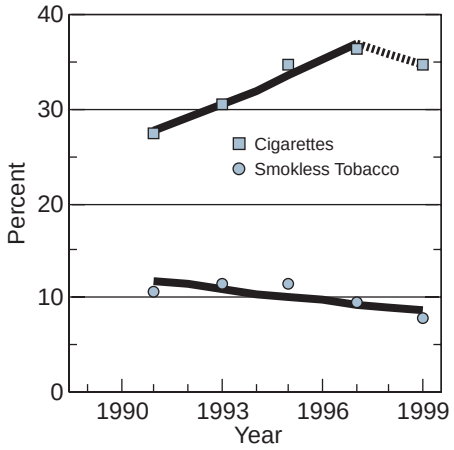
Key Issues

Since 1997, current smoking leveled off or possibly began to decline among 9th-11th graders. However, it has risen steadily among 12th graders since 1991.

In 1999, 13 percent of middle school students (grades 6 to 8) reported using some form of tobacco in the past month. Cigarettes were the most popular, followed by cigars.

Bidis—increasingly popular among young people—can be even more dangerous than cigarettes. Bidis produce higher levels of carbon monoxide, nicotine, and tar than cigarettes. Also, bidi smokers tend to inhale more often and more deeply than cigarette smokers.

Figure 2: Percent of High School Students (Grades 9-12) Who Were Current Users of Cigarettes or Smokeless Tobacco—1991-1999



Source: Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion. Youth Risk Behavior Surveillance System.

Key Words: Smoking Initiation

Age of Smoking Initiation

The average age at which people first begin smoking has been relatively stable in recent years.

Age of Initiation and Cancer

The younger a person starts smoking, the greater the lifelong risk of developing smoking-related cancers. That is because young smokers are more likely to become addicted, and the more years one smokes, the greater the risk of cancer.

Measure

Average age of first use of cigarettes, based on responses from people ages 12 and older, 12 to 17, and 18 to 25.

Period – 1990-1999

Trends

12 +: Rising slightly in the early 1990s, then stable

12-17: Rising slightly

18-25: Rising until 1997, then stable

Most Recent Estimates

In 1999, the average age at first use among people ages 12 and older was 15.4 years. Among 12- to 17-year-olds, the average age was 12.4. Among those 18 to 25, the average age was 14.8.

Healthy People 2010 Targets

Increase the average age at first use of cigarettes to:

- 14 years of age for 12- to 17-year-olds.
- 17 years of age for 18- to 25-year-olds.

There is no Healthy People 2010 target for ages 12 and older as a group.

Key Words: Smoking Initiation

Groups at High Risk for Beginning Smoking

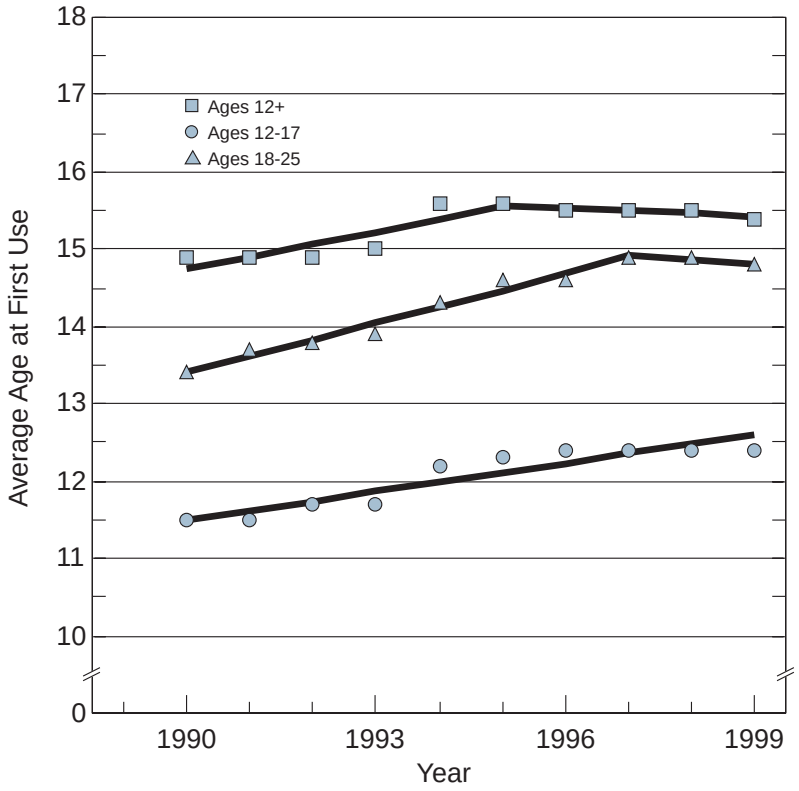
Young people who come from low-income families with less education are more likely to smoke. So are those who have less success and involvement in school and fewer skills to resist the pervasive pressures to use tobacco. Tendencies to take risks and rebel are among the other risk factors for beginning smoking.

Key Issues

Most smokers try their first cigarette before the age of 18 and become addicted during adolescence.

Efforts to help young people delay or avoid smoking may help to prevent some cancers.

Figure 3: Average Age at First Use of Cigarettes for Respondents Ages 12+, 12-17, and 18-25—1990-1999



Source: Substance Abuse and Mental Health Services Administration, Office of Applied Studies. National Household Survey on Drug Abuse.

Key Words: Quit Smoking

Quitting

Adult quitting rates are improving after a decline in the early 1990s.

The Effects of Quitting Smoking on Cancer

Ten years after quitting smoking, a person's risk of getting lung cancer is about one-third to one-half that of people who continue to smoke. The longer the time off cigarettes, the lower the risk. Quitting also reduces the risk of getting cancers of the larynx, esophagus, pancreas, bladder, and cervix.

Also, the sooner one quits smoking, the better. Long-term smokers who stop smoking at around 50 or 60 years of age are less likely to get lung cancer than are people who continue to smoke. Quitting at around age 30 lowers this risk even more.

The quickest non-cancer health benefit of quitting is a lower risk of coronary heart disease. This risk is cut in half after one year of quitting. After 15 years, the chance of getting the disease is similar to that of people who never smoked.

Measures

Daily cigarette smokers (ages 25 and older) who showed some quitting activity.

Daily cigarette smokers (ages 25 and older) who were able to stay off cigarettes 3 months or longer.

Period – 1992-1993, 1995-1996, and 1998-1999

Trends – Falling, then rising

Between 1992-1993 and 1995-1996, there was a clear decline in attempts to quit smoking as well as in successful longer-term quitting. From 1995-1996 to 1998-1999, both of these activities increased.

Most Recent Estimates

In 1998-1999, at least 36 percent of daily smokers 25 years of age and older made some attempt to quit. Five percent of daily smokers were able to stay off cigarettes 3 months or longer.

Also, in 1998, 41 percent of adult smokers (ages 18 and older) stopped smoking for a day or longer because they were trying to quit. Trend data are not available for this measure.

Healthy People 2010 Target

Increase to 75 percent the proportion of adult smokers (ages 18 and older) who stopped smoking for a day or longer because they were trying to quit.

There are no targets in Healthy People 2010 for the other quit measures in this report.

Key Words: Quit Smoking

Groups at High Risk for Not Quitting

Older smokers (ages 65 years and older) are much less likely to try to quit. However, once they do quit, this group is more likely to be successful for 3 months or longer.

Blacks have higher rates of trying to quit than Whites, but lower rates of successfully quitting for 3 months or longer.

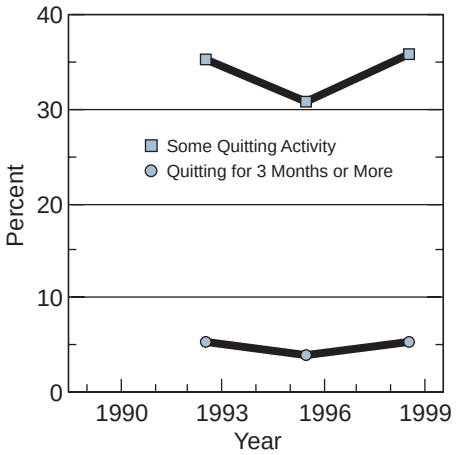
Smokers with lower levels of education and income are less likely to be successful quitters.

Key Issues

Studies show that most smokers want to quit.

Efforts to reduce smoking are most effective when multiple techniques are used, including educational, clinical, regulatory, and economic interventions (for example, increasing excise taxes), along with media campaigns and other social strategies.

Figure 4: Percent of Daily Smokers (Ages 25+) Who Tried to Quit or Quit for 3 Months or Longer—1992-1993, 1995-1996, and 1998-1999



Source: Tobacco Use Supplement to the Current Population Survey, sponsored by the National Cancer Institute.
Age-adjusted to the year 2000 standard population.

Key Word: Alcohol

Alcohol Consumption

Per capita alcohol consumption is falling slightly.

Alcohol and Cancer

Drinking alcohol increases the risk of cancers of the mouth, esophagus, pharynx, larynx, and liver in men and women, and breast cancer in women. In general, these risks increase after about one daily drink for women and two daily drinks for men. (A drink is defined as 12 ounces of regular beer, 5 ounces of wine, or 1.5 ounces of 80-proof liquor.)

Two drinks daily increase the risk of getting breast cancer by about 25 percent. The chances of getting liver cancer increase with five or more daily drinks.

The earlier that long-term, heavy alcohol use begins, the greater the cancer risk. Also, using alcohol with tobacco is riskier than using either one alone, because it further increases the chances of getting cancers of the mouth, throat, and esophagus.

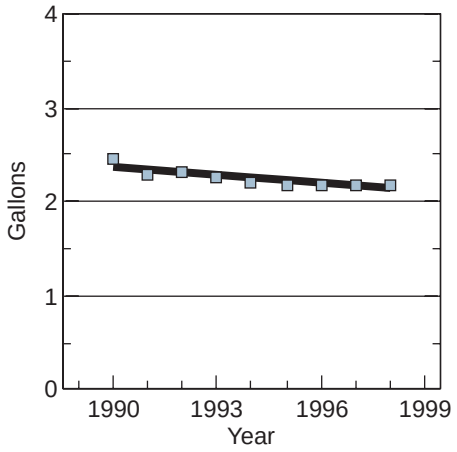
Measure

Per capita alcohol consumption: The estimated number of gallons of pure alcohol drunk per person (ages 14 and older), per year. This measure accounts for the varying alcohol content of wine, beer, and liquor. People as young as 14 are included because a large number of adolescents begin drinking at an early age.

Period – 1990-1998

Trend – Falling slightly

Figure 5: Per Capita Alcohol Consumption (Ages 14+)—1990-1998



Source: National Institute on Alcohol Abuse and Alcoholism.

Most Recent Estimate

In 1998, per capita alcohol consumption was 2.19 gallons for all beverages, including beer, wine, and liquor.

Healthy People 2010 Target

Reduce per capita alcohol consumption to 2 gallons.

Groups at High Risk for Using Alcohol

Many people start drinking as early as middle school (13- to 14-year-olds).

Among 12- to 17-year-olds, Whites and Hispanics are more likely than Blacks to use alcohol.

Among alcohol drinkers, those ages 18 to 25 consume greater quantities than any other group.

Key Issues

People who drink and smoke may find it harder to stop either of these behaviors.

Drinking low levels of alcohol can have both negative and positive health effects: It raises the risk of getting breast cancer and lowers the risk of getting heart disease. Therefore, women who already are at low risk for heart disease could reduce their risk of breast cancer by avoiding regular alcohol use.

Key Words: Fruits and Vegetables

Fruit and Vegetable Consumption

Americans are eating only slightly more fruits and vegetables than a decade ago.

Fruits and Vegetables Reduce Cancer Risk

People whose diets are rich in fruits and vegetables have a lower risk of getting cancers of the lung, mouth, pharynx, esophagus, stomach, colon, and rectum. They also are less likely to get cancers of the breast, pancreas, larynx, and bladder.

To help prevent these cancers and other chronic diseases, experts recommend 5-9 servings of fruits and vegetables daily. This includes 2-4 servings of fruits and 3-5 servings of vegetables, with dark-green and deep-yellow vegetables making up about one-third (about 1 to 2 servings) of the vegetable servings. There is no direct evidence that America's favorite vegetable, the white potato, protects against cancer.

Measure

Average daily servings of fruits and vegetables for people ages 2 and older. This measure includes fruits and vegetables from all sources.

Period – 1989-1991 and 1994-1996

Trends

Fruits: Rising

Vegetables: Rising slightly

Total average daily servings of fruits and vegetables increased from 4.5 servings in 1989-1991 to 4.9 servings in 1994-1996. Fruit servings rose from 1.3 to 1.5 servings. Vegetable servings rose from 3.2 to 3.4 servings.

Most Recent Estimates

In 1994-1996, people ages 2 and older had, on average, 1.5 servings of fruits and 3.4 servings of vegetables, for a total 4.9 servings of fruits and vegetables. Total vegetable servings included:

- Dark-green/deep-yellow: 0.4 servings.
- Starchy: 1.5 servings (mostly fried potatoes).
- Tomatoes and other vegetables: 1.5 servings.

Among racial and ethnic groups, Blacks had 4.5 total servings; Whites and Hispanics, 5; Asian/Pacific Islanders, 5.6; and Native Americans, 6.

Healthy People 2010 Targets

At least two daily servings of fruits.

At least three daily servings of vegetables, with at least one-third being dark-green/deep-yellow.

(The Healthy People 2010 targets call for 75 percent of the population to consume the minimum servings of fruits and 50 percent to consume the minimum servings of vegetables.)

Key Words: Fruits and Vegetables

Fruit and Vegetable Consumption *(continued)*

Groups at High Risk for Not Eating Enough Fruits and Vegetables

Young children (ages 2-11 years), teenage girls, and young women eat the fewest numbers of servings of fruits and vegetables—about four per day. People with lower levels of income and education tend to eat fewer fruits and vegetables. Among racial and ethnic groups, Blacks have the lowest intake.

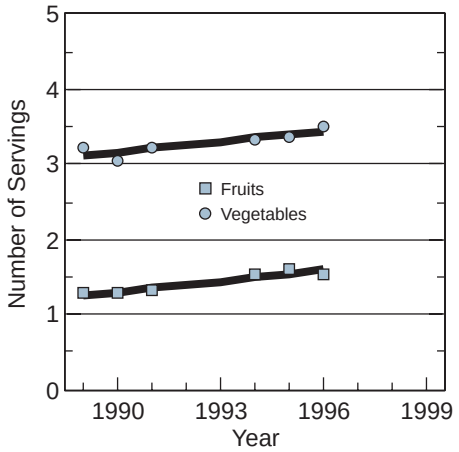
Key Issues

Although, on average, people consume more than the recommended three daily servings of vegetables, they do not consume enough dark-green/deep-yellow varieties.

Consumers—especially those living in low-income and urban areas—need access to affordable fruits and vegetables. However, between 1982 and 1997, fruits and vegetables had more retail price increases than all other food categories.

While five servings of fruits and vegetables is the minimum daily recommendation, estimates based on caloric needs suggest that Americans actually need an average of seven daily servings. These additional servings should replace sources of "empty calories" in the diet, such as added sugars and fats, to avoid taking in too many calories.

Figure 6: Average Daily Servings of Fruits and Vegetables (Ages 2+)—1989-1991 to 1994-1996



Source: U.S. Department of Agriculture. Continuing Survey of Food Intakes by Individuals.
Age-adjusted to the year 2000 standard population.

Key Word: Fats

Fat Consumption

Americans are getting a smaller portion of their calories from fat.

Fat Consumption and Cancer

Some studies have linked high-fat diets and different types of fat in the diet to several cancers, including cancers of the colon, prostate, lung, and endometrium. Saturated fatty acids are thought to be the most harmful kind. While earlier studies suggested similar results for breast cancer, more recent evidence has raised doubts about the importance of dietary fat in the development of breast cancer.

More research is needed to better understand which types of fat and what amounts alter cancer risk. Although monounsaturated and polyunsaturated fatty acids have been studied for a number of years, their effects are still unclear. More recent research on the effects of trans fatty acids also has yet to reach definite conclusions.

The U.S. Dietary Guidelines recommend getting less than 10 percent of calories from saturated fatty acids for general health and the prevention of chronic disease, including cancer and heart disease. The Guidelines also recommend no more than 30 percent of calories from total fat.

Measure

Intakes of total fat, and of the major fatty acids—saturated, monounsaturated, and polyunsaturated—all as a percentage of total calories.

Period – 1989-1991 and 1994-1996

Trends – Falling slightly overall

Total fat: Falling slightly

Saturated: Falling

Monounsaturated: Stable

Polyunsaturated: Falling slightly

Most Recent Estimates

Data collected from 1994-1996 show that total fat made up one-third (33 percent) of the calories people consumed, a slightly higher level than recommended. In the same period, saturated fatty acids accounted for 11 percent of calories; monounsaturated, 13 percent; and polyunsaturated, 7 percent.

Healthy People 2010 Target

No more than 30 percent of daily calories from fat.

(The Healthy People 2010 target calls for 75 percent of the population to reach this level.)

Key Word: Fats

Fat Consumption *(continued)*

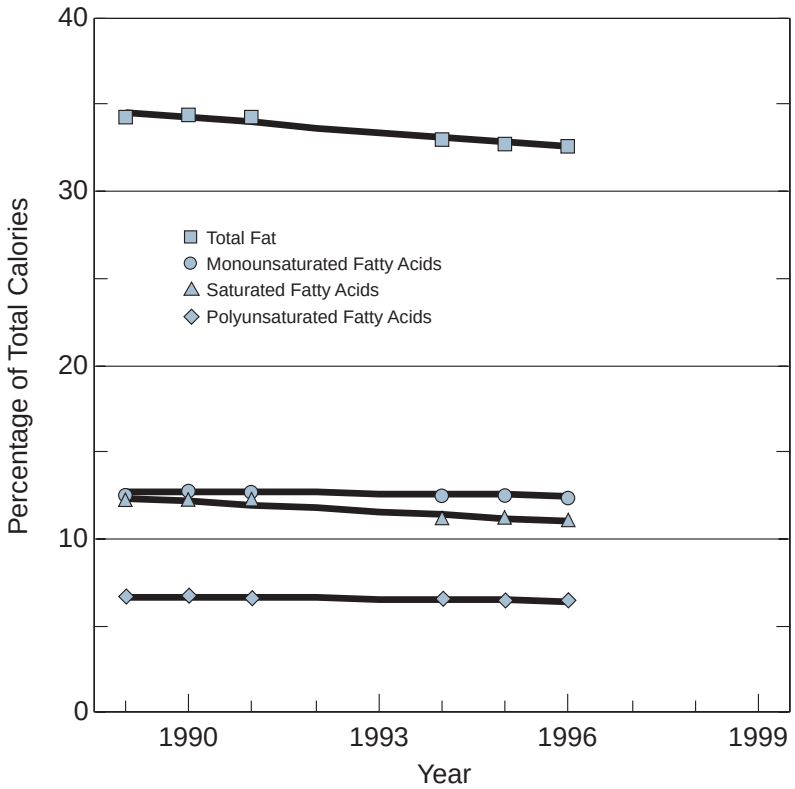
Groups at High Risk for Eating Too Much Fat

Intake of fat and the major fatty acids does not vary in the U.S. population by major racial or ethnic groups. Total fat intakes tend to decrease as education levels increase.

Key Issues

Researchers are studying how fat and fatty acids alter cancer risk. Precise and reliable measures of the amount and type of fat are needed—especially biological indicators of fat intake that might be determined from a blood test.

Figure 7: Trends in Fat Intakes as a Percentage of Total Calories—1989-1991 to 1994-1996



Source: U.S. Department of Agriculture. Continuing Survey of Food Intakes by Individuals.
Age-adjusted to the year 2000 standard population.

Key Word: Weight

Weight

More adults are becoming overweight and obese.

Overweight, Obesity, and Cancer

Being overweight increases the chances of health problems, including heart disease, stroke, diabetes, and some cancers.

In women, overweight and obesity, weight gain, and increased amounts of fat at the waist or around the body's mid-section double to triple the chances of getting endometrial cancer. These factors also double the chances of getting breast cancer after menopause.

Obesity and increased body fat raise the risk of getting colorectal cancer. Overweight and obesity are linked to an increased risk of some types of esophageal and kidney cancers.

Measures

Percent of adults (ages 20-74) who are at a healthy weight, overweight, or obese.

These weight groups are defined by a measurement called body mass index (BMI). BMI is found by dividing weight (in kilograms) by height (in meters) squared.

Healthy weight in adults: BMI greater than or equal to 18.5 and less than 25

Overweight in adults: BMI of 25 or more

Obesity in adults: BMI of 30 or more

Period – 1971-1974, 1976-1980, and 1988-1994

Trends

Healthy weight: Stable, then falling slightly

Overweight: Stable, then rising slightly

Obesity: Rising slightly (though not statistically significant), then rising

Early data from 1999 show even further increases in overweight and obesity.

Most Recent Estimates

Among adults in 1988-1994:

- 42 percent were at a healthy weight.
- 56 percent were overweight.
- 23 percent were obese.

Healthy People 2010 Targets

Increase to 60 percent the proportion of adults who are at a healthy weight.

There is no Healthy People 2010 target for overweight.

Decrease to 15 percent the proportion of obese adults.

Key Word: Weight

Weight *(continued)*

Groups at High Risk for Being Overweight or Obese

Overweight and obesity are most common among Black and Mexican-American women. The same patterns are seen for children and teens in these groups.

Overweight children are more likely to become overweight adults and to suffer from the illnesses that come with it as well as premature death. As with adults, the trend toward excess weight among children has greatly increased in recent years.

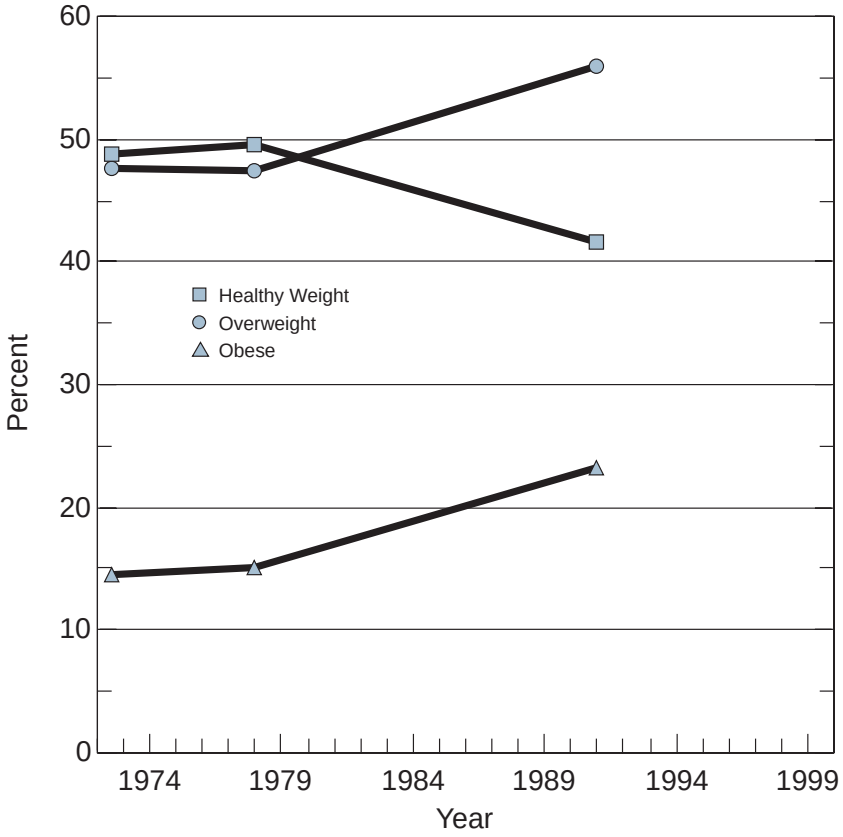
Key Issues

Daily physical activity balanced with appropriate calorie intake is one of the most effective ways to avoid weight gain. Lack of activity is believed to be one of the major reasons for the increase in overweight among U.S. youth and adults.

Increased TV watching is linked with excess weight.

See page 37 for trends in physical activity.

Figure 8: Percent of Adults (Ages 20-74) Who Were at a Healthy Weight, Overweight, or Obese—1971-1974, 1976-1980, and 1988-1994



Source: National Center for Health Statistics. National Health and Nutrition Examination Survey.
Age-adjusted to the year 2000 standard population.

Key Words: Physical Activity

Physical Activity

Only about two-thirds of adults get any physical activity in their leisure time.

Physical Activity Reduces Cancer Risk

Physical activity at work or during leisure time is linked to a 50 percent lower risk of getting colon cancer. Both vigorous and moderate levels of physical activity appear to reduce this risk. Physical activity probably is connected with a lower risk of breast cancer and possibly prostate cancer. Studies continue to look at whether physical activity has a role in reducing the chances of getting other cancers.

Measure

Percent of adults ages 18 and older who had no leisure-time physical activity during the past month.

Period – 1990-1998

Trend – Falling slightly

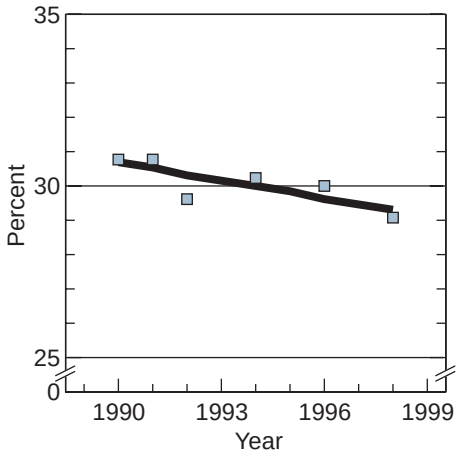
This means that only slightly more adults have any physical activity in their leisure time. However, this trend is not statistically significant.

Most Recent Estimates

Results from the Behavioral Risk Factor Surveillance System (BRFSS) show that in 1998, 29 percent of adults ages 18 and older reported no physical activity in their leisure time. BRFSS, a telephone survey, was used for *Cancer Progress Report 2001* because data have been available in a consistent form over time.

The 1998 National Health Interview Survey (NHIS), a household survey that used different questions to assess physical activity, indicates that 40 percent of adults 18 and older reported no physical activity in their leisure time.

Figure 9: Percent of Adults (Ages 18+) Reporting No Physical Activity in Their Leisure Time—1990-1998



Source: Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion. Behavioral Risk Factor Surveillance System.
Age-adjusted to the year 2000 standard population.

Healthy People 2010 Target

Reduce to 20 percent the percent of adults who engage in no leisure-time physical activity (based on NHIS data).

Groups at High Risk for Being Inactive in Their Leisure Time

Women are more likely than men, and Blacks and Hispanics are more likely than Whites to report no leisure-time physical activity. Lack of physical activity also is more common among those with less education.

For youth, physical activity is lower among females, especially Blacks. Also, physical activity decreases as children get older.

Key Issues

Since the mid-1980s, fewer high school students have taken part in physical education classes.

Removing barriers (such as lack of physical education classes) and setting up supports (such as bicycle and walking paths) can help to promote physically active lifestyles.

Key Word: Sun

Sun Protection

Fewer than half of adults say they are likely to protect themselves from the sun.

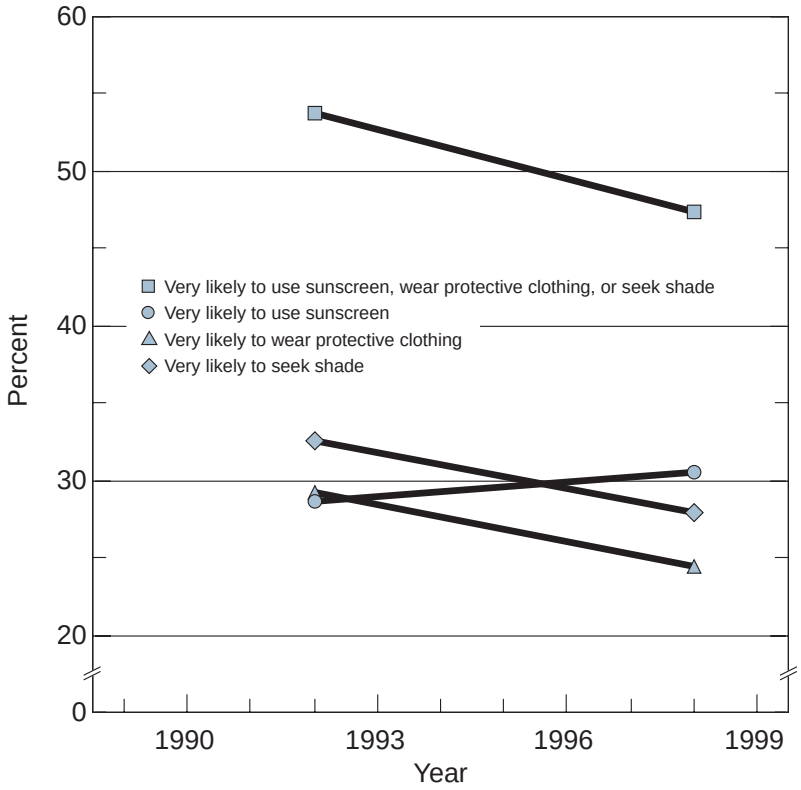
Sun Protection Reduces Cancer Risk

Skin cancers are most common in light-skinned people, although they also occur in people with darker skin. Studies suggest that reducing long-term exposure to the sun, to tanning booths, and to sunlamps can lower the risk of nonmelanoma skin cancer. Avoiding burns from these sources—especially by children and teens—may reduce the chances of getting melanoma skin cancer. The rates of new cases of melanoma increased from 1973 to 1998, although the rate of increase has slowed since 1981.

Measure

Percent of adults ages 18 and older who reported they were "very likely" to practice at least one of three sun-protection behaviors—use sunscreen, wear protective clothing, or seek shade—if they were outside on a sunny day for more than 1 hour.

Figure 10: Percent of Adults (Ages 18+) Very Likely to Protect Themselves From the Sun—1992 and 1998



Source: Centers for Disease Control and Prevention, National Center for Health Statistics. National Health Interview Survey.
Age-adjusted to the year 2000 standard population.

Key Word: Sun

Period – 1992 and 1998

Trends – Falling overall

The percent of people very likely to use at least one sun protection method is falling, as are the percents of people very likely to wear protective clothing and to seek shade. The percent of people very likely to use sunscreen is rising slightly.

Most Recent Estimates

In 1998, 47 percent of adults said they were very likely to practice at least one of three sun protection behaviors:

- 31 percent were very likely to use sunscreen.
- 24 percent were very likely to wear protective clothing.
- 28 percent were very likely to seek shade.

Healthy People 2010 Target

Increase to 75 percent the proportion of adults who are very likely to use sunscreen, wear protective clothing, or seek shade.

Groups at High Risk for Getting Too Much Sun

Younger adults and men are less likely to use some form of sun protection. Adults with lower incomes and less education are less likely to use sunscreen.

Youths (ages 11-18) also are less likely to protect themselves from the sun. A 1998 survey found that few young people routinely practiced these behaviors on sunny days: wearing long pants (21 percent), staying in the shade (22 percent), and using sunscreen (31 percent).

Key Issues

In general, increased exposure to the sun—especially without adequate use of sunscreen and protective clothing—increases the chances of getting skin cancer.

Some research suggests that people apply less than an adequate amount of sunscreen and fail to reapply it appropriately.

Key Words: Secondhand Smoke

Secondhand Smoke

Progress is slow in efforts to enact State laws on smoke-free air.

Secondhand Smoke and Cancer

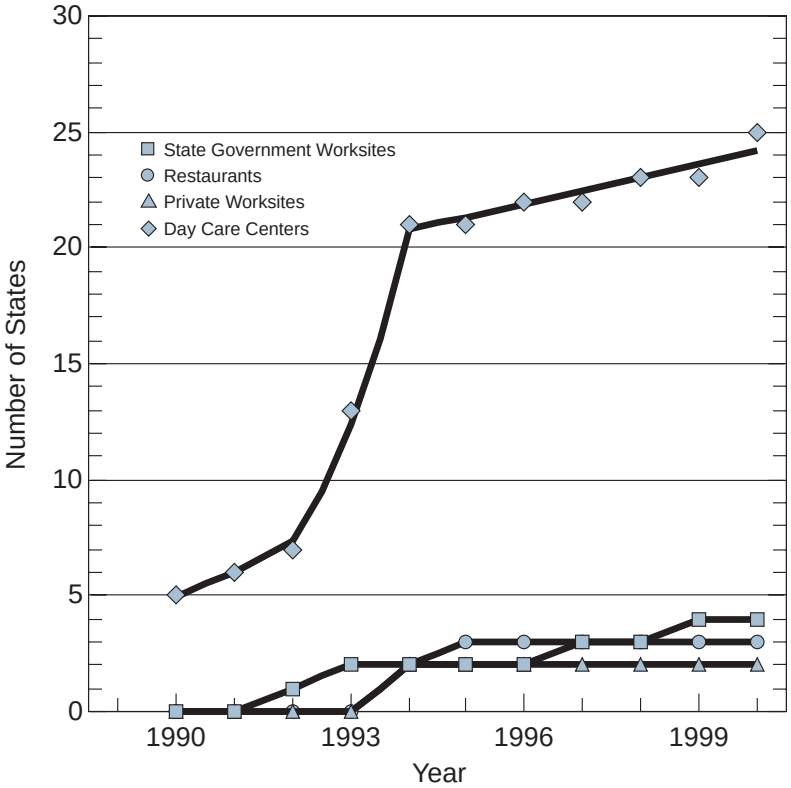
Secondhand smoke—also known as environmental tobacco smoke—is what comes from a burning cigarette, pipe, or cigar, plus what the smoker exhales. Tobacco smoke is known to contain at least 60 carcinogens. People who are exposed to secondhand smoke inhale these chemicals, just as smokers do, although at lower levels.

In 1993, the U.S. Environmental Protection Agency (EPA) reported that secondhand smoke is a "known human carcinogen." The EPA also reported that secondhand smoke causes some 3,000 lung cancer deaths each year among U.S. nonsmokers.

Measures

States (and the District of Columbia) with laws on smoke-free air in State government worksites, private worksites, restaurants, and day care centers.

Figure 11: States With Smoke-Free Indoor Air Laws in State Government Worksites, Private Worksites, Restaurants, and Day Care Centers—1990-2000



Source: National Cancer Institute. State Cancer Legislative Database. Age-adjusted to the year 2000 standard population.

Key Words: Secondhand Smoke

Period – 1990-2000

Trends – Rising in day care centers, but still low. Stable and very low at other sites.

Most Recent Estimates

In 2000, the number of States with smoke-free indoor air laws, as measured in four types of sites, were as follows:

- State government worksites: 4
- Private worksites: 2
- Restaurants: 3
- Day care centers: 25

Results of another survey show that in 1998-1999, 69 percent of the workforce (ages 18 and older) reported there was a smoke-free policy at their workplace. Also during that time, 61 percent of people ages 18 and older reported that smoking is not allowed in their home. These represent significant increases since 1992-1993.

Healthy People 2010 Target

Increase to 51 the number of States (and the District of Columbia) with smoke-free indoor air laws for public places and worksites.

Groups at High Risk for Exposure to Secondhand Smoke

People with lower income and education levels are more likely to be exposed to smoking in their workplaces and homes. Men and younger adults are more likely to work in places that allow smoking.

Key Issues

Although secondhand smoke remains a major public health concern, nonsmokers' exposure to tobacco smoke declined more than 75 percent from 1988-1991 to 1999.

In 1999, nearly 7 out of 10 U.S. workers reported a smoke-free policy in their workplace.

State laws that protect against secondhand smoke slowly became more common in the past decade. It appears that greater improvement came from voluntary or local efforts during that time.

Key Word: Radon

Radon in the Home

More people live in homes tested for radon.

Radon and Cancer

Radon—an invisible, odorless, tasteless gas that is released from rocks and soil—enters homes through cracks and holes in the foundation. Indoor radon is the most serious environmental cancer-causing agent to which the general public is exposed. The Environmental Protection Agency estimates that as many as 8 million homes in the United States have high levels of radon. State surveys show that one out of five homes have high levels.

Radon is second only to tobacco as the leading cause of lung cancer. Radon found in homes may contribute to as many as 20,000 lung cancer deaths each year. It is a more serious health threat to underground miners.

People who are exposed to both radon gas and tobacco smoke are more likely to get lung cancer than are people who are exposed to either one alone. Most radon-related deaths from lung cancer occur among smokers.

Measure

The percent of people who live in homes tested for radon concentrations, among those who have heard of radon.

Period – 1991-1998

Trend – Rising

Most Recent Estimate

In 1998, 17.5 percent of Americans who have heard of radon lived in homes tested for radon.

Healthy People 2010 Target

Increase to 20 percent the proportion of people who have heard of radon who live in homes tested for radon.

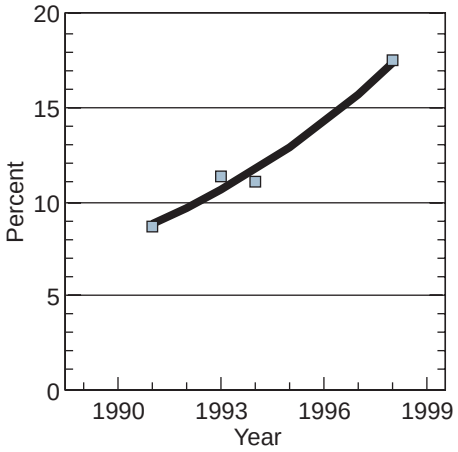
Groups at High Risk for Not Testing for Radon

People who live in homes with a smoker are less likely to test for radon than are those who live in homes without smokers.

Key Issues

Researchers estimate that lowering indoor radon exposure would prevent about 30 percent of lung cancer deaths from radon. Of these, 86 percent would be among smokers or former smokers.

Figure 12: Percent of People Who Have Heard of Radon Who Live in Homes Tested for Radon—1991-1998



Source: Centers for Disease Control and Prevention, National Center for Health Statistics. National Health Interview Survey.

Key Word: Benzene

Benzene in the Air

Benzene concentrations in the air are going down.

Benzene and Cancer

Benzene is a natural part of crude oil, gasoline, and cigarette smoke. It is also used as a gasoline additive and in the manufacture of a number of products.

The general population's main exposure to benzene is inhaling air that contains it. About half of human exposures to benzene come from smoking and secondhand smoke. Other sources include vapors from heavy traffic and gas stations. Long-term exposure to high levels of benzene in the air can cause leukemia.

Measure

National yearly average concentrations of benzene in the air in metropolitan areas, measured in micrograms per cubic meter.

Period – 1993-1998

Trend – Falling

From 1993 to 1998, the average yearly concentrations of benzene declined by 37 percent.

Most Recent Estimate

In 1998, the average concentration of benzene was 1.85 micrograms per cubic meter.

Healthy People 2010 Target

There is no Healthy People 2010 target for this measure.

Groups at High Risk for Benzene Exposure

People who are exposed to benzene include those who work around or with benzene, smokers, and people who are exposed to secondhand smoke.

Key Issues

The Environmental Protection Agency says that benzene concentrations in the air have declined because reformulated gasoline is being used in many parts of the United States. This is an example of how changes to the environment can help to lower cancer risk.

More measures of environmental chemical carcinogen exposures—such as those reported by the National Center for Environmental Health, Centers for Disease Control and Prevention—need to be tracked over time.

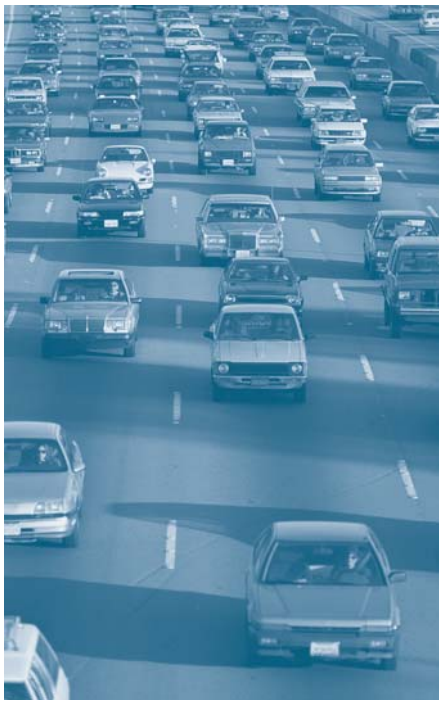
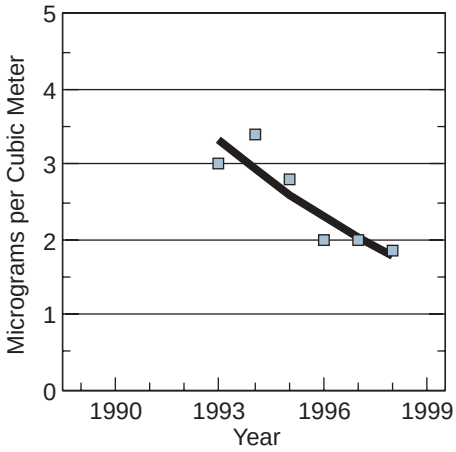


Figure 13: National Trend in Annual/Average Benzene Concentrations in Metropolitan Areas (micrograms per cubic meter)—1993-1998



Source: Environmental Protection Agency. National Air Quality and Emissions Trends Report, 1998. March 2000.

Key Words: Early Detection

Early Detection

The use of screening tests to detect cancers early often leads to more effective treatment with fewer side effects. Patients whose cancers are found early also are less likely to die from these cancers than are those whose cancers are not found until symptoms appear.

This section describes trends in the use of the following screening tests, each of which has been found to detect cancers accurately and to decrease the chances of dying from cancer:

- Mammography (for breast cancer)
- Pap smear (for cervical cancer)
- Fecal occult blood test (for colorectal cancer)
- Sigmoidoscopy (for colorectal cancer)

Trends for newer ways to detect cancer, such as the prostate specific antigen (PSA) test, may be included in future editions of the *Cancer Progress Report*. PSA use has not yet been proven to reduce deaths from prostate cancer. There is also concern about possible harm caused by unnecessary treatments, because the test can find very early cancers that might not cause any harm if left untreated—especially in older men. Other screening methods, such as new imaging techniques to detect lung cancer, or ways to detect early cancer in the blood, also require more research.

Key Word: Mammography

Breast Cancer Screening

Mammography use has increased steadily in women ages 40 and older.

Benefits of Screening Mammography

Regular use of screening mammograms can help reduce the chances of dying from breast cancer. For women between the ages of 50 and 69, there is strong evidence that screening lowers this risk by 30 percent. For women in their 40s, the risk can be reduced by about 17 percent. For women ages 70 and older, mammography may be helpful, although firm evidence is lacking.

Measure

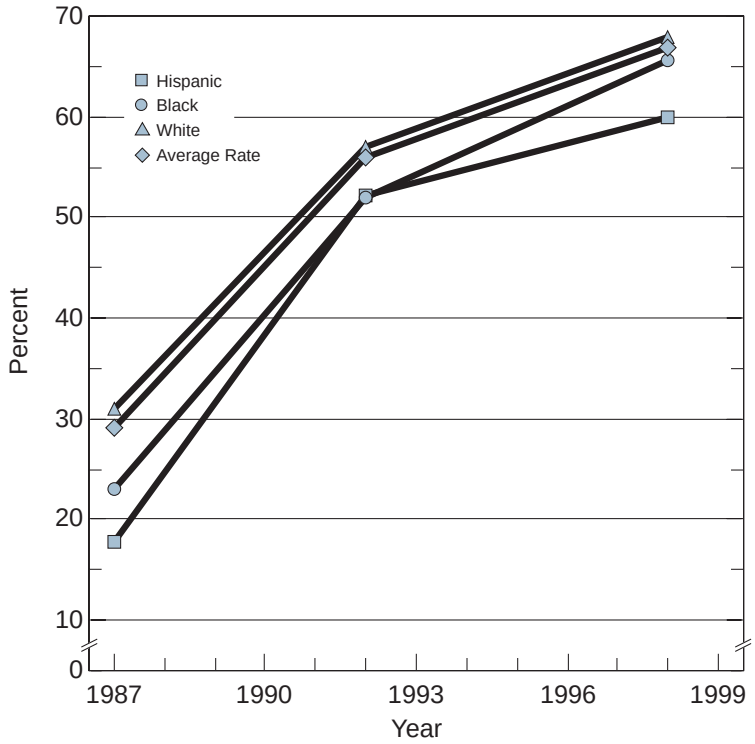
Percent of women ages 40 years and older who reported they had a mammogram within the past 2 years, by racial/ethnic group.

Period – 1987, 1992, and 1998

Trends – Rising

Mammography use is increasing among Hispanic, Black, and White women ages 40 and older.

Figure 14: Percent of Women (Ages 40+) Who Had Mammography Within the Past 2 Years, by Race/Ethnicity—1987, 1992, and 1998



Source: Centers for Disease Control and Prevention, National Center for Health Statistics. National Health Interview Survey.
Age-adjusted to the year 2000 standard population.

Most Recent Estimates

In 1998, 67 percent of women ages 40 and older had a mammogram within the past 2 years. Among racial and ethnic groups, 60 percent of Hispanics, 66 percent of Blacks, and 68 percent of Whites had a mammogram within the past 2 years. Notably, differences between these groups were minimal.

Healthy People 2010 Target

Increase to 70 percent the proportion of women ages 40 and older who have received a mammogram within the past 2 years.

Groups at High Risk for Not Being Screened

Poor, less educated women who lack health insurance or a usual source of care are less likely to get screening mammograms.

Key Issues

The barriers that prevent high-risk groups from getting regular mammograms need to be removed.

While millions of women have had at least one screening mammogram, many women still have not. Also, even among those women who had a recent screening mammogram, many do not do so on a regular basis.

Key Words: Pap Smear

Cervical Cancer Screening

Pap smear use is rising slightly among women ages 18 and older.

Benefits of Pap Smear Testing

Regular use of the Pap smear test reduces deaths from cervical cancer. Women who have not been screened face a 3 to 10 times greater risk of developing invasive cervical cancer.

Measure

Percent of women ages 18 years and older who reported they had a Pap smear within the past 3 years.

Period – 1987, 1992, and 1998

Trend – Rising slightly

Most Recent Estimate

In 1998, 79 percent of women ages 18 and older had a Pap smear within the past 3 years.

Healthy People 2010 Target

Increase to 90 percent the proportion of women ages 18 and older who have received a Pap smear within the past 3 years.

Groups at High Risk for Not Being Screened

Older, poor, less educated women are less likely to be screened for cervical cancer. At the same time, older women are at greater risk than younger women of dying from cervical cancer.

Key Issues

Regular Pap smear testing needs to be encouraged for all women. Special efforts are needed for the following groups: older, poor, less educated women; women who have emigrated to this country; and sexually active women, who are more likely to be exposed to the human papillomavirus and the human immunodeficiency virus, both of which can increase the risk of developing cervical cancer.

Promising new techniques are more likely to detect cancer cells in the cervix and to detect viruses known to cause this cancer.

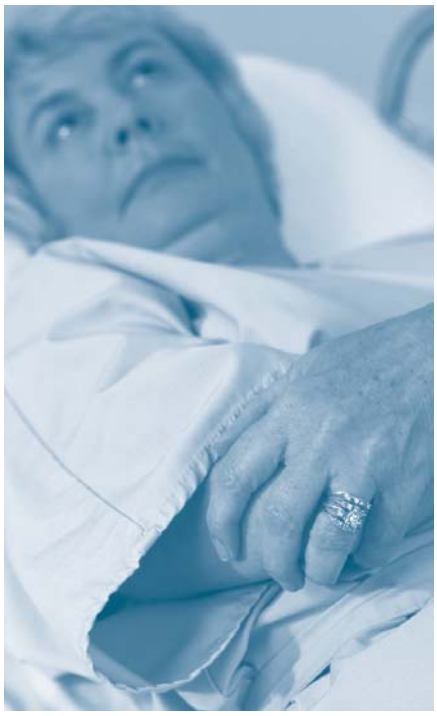
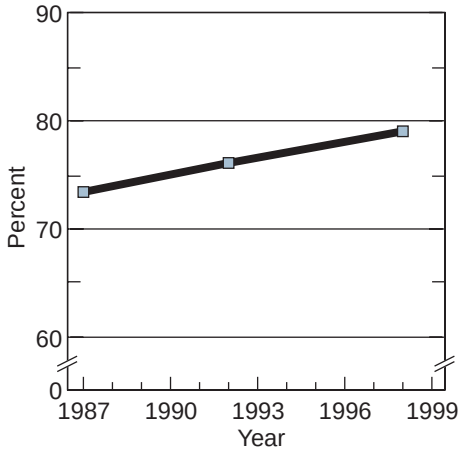


Figure 15: Percent of Women (Ages 18+) Who Had a Pap Smear Test Within the Past 3 Years—1987, 1992, and 1998



Source: Centers for Disease Control and Prevention, National Center for Health Statistics. National Health Interview Survey.
Age-adjusted to the year 2000 standard population.

Key Word: Colorectal

Colorectal Cancer Screening

Colorectal cancer screening rates have risen but remain low among people ages 50 and older.

Benefits of Screening Tests for Colorectal Cancer

Research supports the use of two screening tests for colorectal cancer:

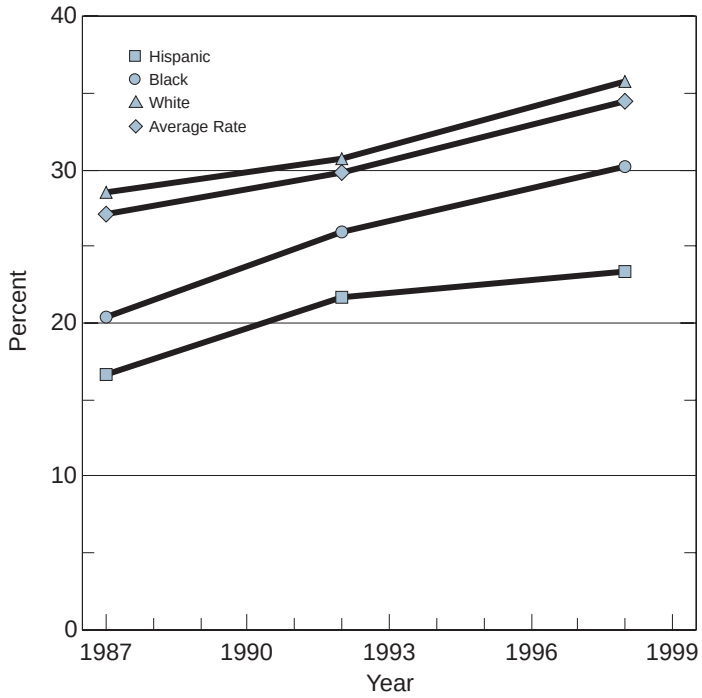
- **The fecal occult blood test (FOBT).** When done every 1 to 2 years in people ages 50-80, the FOBT can decrease the number of deaths due to colorectal cancer.
- **Sigmoidoscopy (also known as proctosigmoidoscopy).** Regular sigmoidoscopies can reduce colorectal cancer deaths. More research is needed to learn the best timing between exams.

Measures

FOBT: Percent of people ages 50 and older who reported they had an FOBT within the past 2 years, by racial/ethnic group.

Sigmoidoscopy: Percent of men and women ages 50 and older who reported they ever had a sigmoidoscopy.

Figure 16: Percent of Adults (Ages 50+) Who Had an FOBT Test Within the Past 2 Years, by Race/Ethnicity—1987, 1992, and 1998



Source: Centers for Disease Control and Prevention, National Center for Health Statistics. National Health Interview Survey. Age-adjusted to the year 2000 standard population.

Key Word: Colorectal

Colorectal Cancer Screening *(continued)*

Period – 1987, 1992, and 1998

Trends – Rising overall

FOBT: Rising overall. In Whites, rising slightly (though not statistically significant), then rising. Rising in Blacks, though not statistically significant. Rising, then rising slightly in Hispanics, though neither of these trends is statistically significant. *(Figure 16.)*

Sigmoidoscopy: Rising overall and in men. Rising, then rising slightly in women, though the latter trend for women is not statistically significant. *(Figure 17.)*

Most Recent Estimates

In 1998, 34 percent of people 50 and older had an FOBT within the past 2 years. This includes 23 percent of Hispanics, 30 percent of Blacks, and 36 percent of Whites. *(Figure 16.)*

In 1998, 37 percent of people 50 and older had ever had a sigmoidoscopy. This includes 43 percent of men and 33 percent of women. *(Figure 17.)*

Healthy People 2010 Targets

Increase to 50 percent the proportion of adults ages 50 and older who have had an FOBT within the past 2 years.

Increase to 50 percent the proportion of adults ages 50 and older who have ever had a sigmoidoscopy.

Groups at High Risk for Not Being Screened

People with lower incomes, less education, and no health care coverage are less likely to be screened for colorectal cancer.

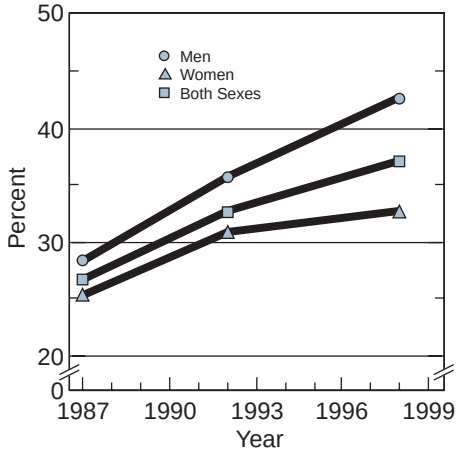
Key Issues

Despite some improvements over time, colorectal cancer screening rates remain low. It is important to understand and overcome doctor and patient barriers to these life-saving tests.

Newer screening methods, such as colonoscopy, are promising and need further evaluation.

A substantial proportion of reported FOBT and sigmoidoscopy procedures may be for diagnostic rather than screening purposes.

Figure 17: Percent of Men and Women (Ages 50+) Who Ever Had a Sigmoidscopy—1987, 1992, and 1998



Source: Centers for Disease Control and Prevention, National Center for Health Statistics. National Health Interview Survey. Age-adjusted to the year 2000 standard population.

Key Word: Diagnosis

Diagnosis

The rates of newly diagnosed cancer cases (incidence) are one way to measure progress against cancer. The lower the rates, the better.

Another important measure is the proportion of cancers diagnosed at a late stage. The stage of a cancer shows how far the disease has progressed. The lower the stage at diagnosis, the better the chances for cure. Downward trends in the proportion of late cancer diagnoses are a sign that screening is working for the cancers for which early detection methods are available.

This section of *Cancer Progress Report 2001* provides data on the rates of new cancers in the United States—by cancer site and by racial and ethnic group. Also included are data on the proportion of cancers diagnosed at the late stage for five of the major cancer sites: breast, colon, rectum, cervix, and prostate.

Key Word: Incidence

Incidence

After several decades of steady increases, rates of new cancers began to decline in 1992.

Measuring New Cancer Cases

In 1998, more than half of all new cancers were cancers of the prostate, breast, lung, and colon/rectum. It is projected that there will be 1,268,000 new cases of cancer in 2001, including 198,100 prostate cancers; 192,200 female breast cancers; 169,500 lung cancers; and 135,400 cancers of the colon/rectum.

Cancer incidence usually is measured as the number of new cases each year for every 100,000 people.

Measure

Incidence rate: The number of new cancer cases per 100,000 people per year.

Period – 1973-1998

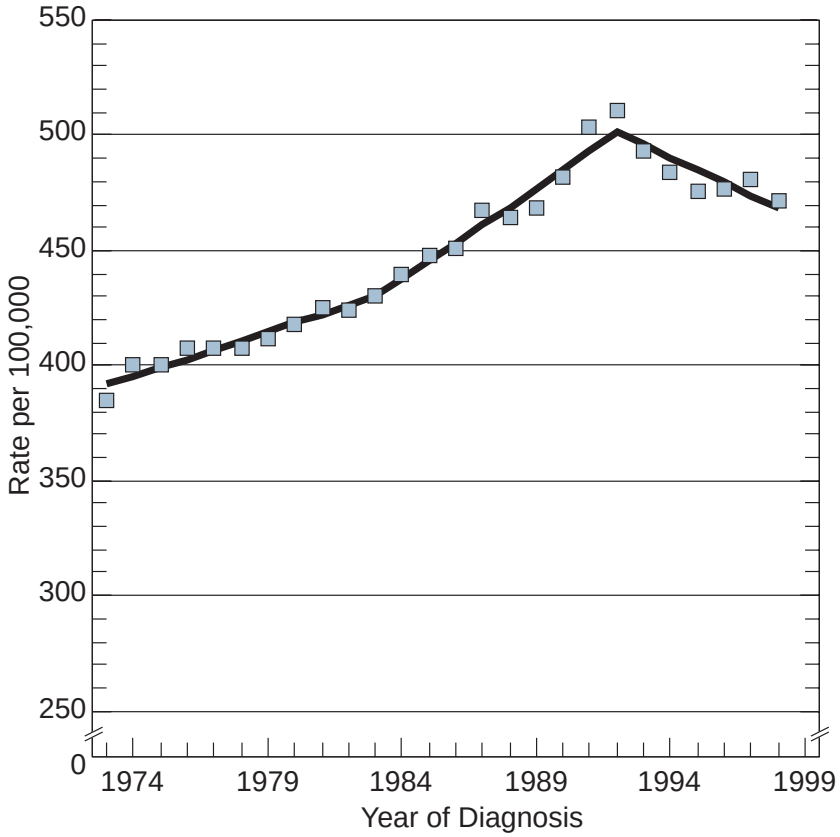
Trends – Rising, then falling slightly overall

U.S. cancer incidence for all sites combined was on the rise until early 1992, when it began to decline *(Figure 18)*.

For the four most common cancers *(Figure 19)*:

- The incidence of prostate cancer rose sharply beginning around 1988, peaked in 1992, and began a sharp decline until around 1995, after which it became stable.
- The incidence of breast cancer steadily increased between 1980 and 1987, and has remained stable since then. For ages 50-64, there appears to be a slight increase in recent years.
- The incidence of lung cancer increased until 1992, after which it declined slightly. However, for women the rates continue to increase, although not as rapidly as earlier.
- The incidence of colorectal cancer increased slightly until 1985. It has declined steadily since then, except for a slight rise since 1995, though this recent trend is not statistically significant.

Figure 18: Rates of New Cases of All Cancers—1973-1998



Source: SEER Program, National Cancer Institute.
Rates are per 100,000 population and age-adjusted by 5-year age groups to the 2000 U.S. standard million.

Most Recent Estimate

In 1998, the rate of new cases of all cancers was 471 per 100,000 people *(Figure 18)*.

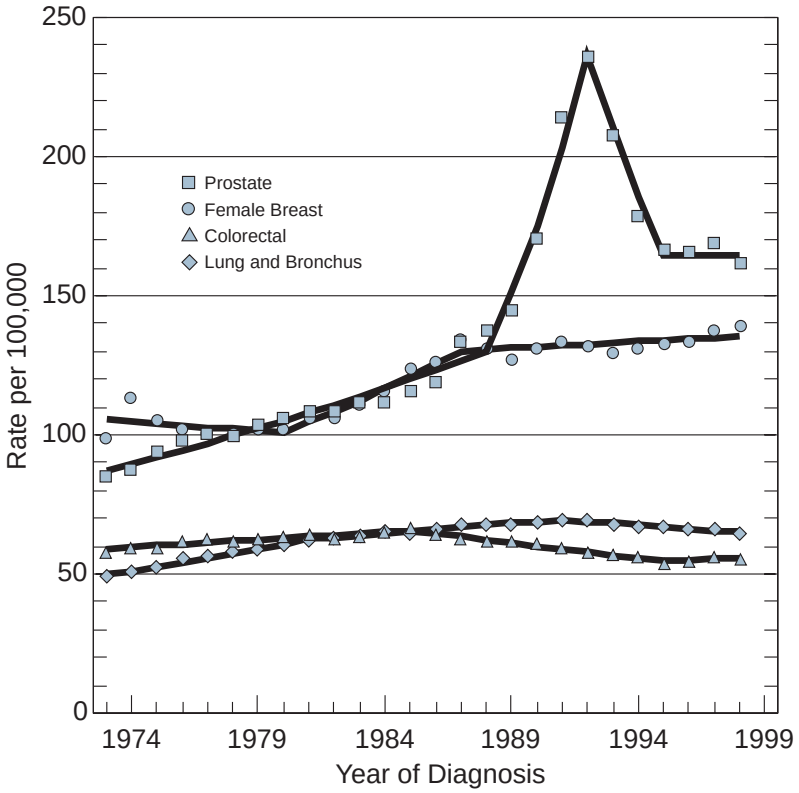
Healthy People 2010 Target

There is no Healthy People 2010 target for this measure.

Groups at High Risk for Getting New Cancers

Blacks have the highest rate of new cancers. Rates are very low among American Indians/Alaska Natives. *(Figure 20.)* These disparities are not likely to be due to differences in people's genes or body makeup. Rather, they are more likely to do with social, cultural, behavioral, and environmental factors.

Figure 19: Rates of New Cases of the Four Most Common Cancers—1973-1998



Source: SEER Program, National Cancer Institute.
Rates are per 100,000 population and age-adjusted by 5-year age groups to the 2000 U.S. standard million.

Key Word: Incidence

Incidence *(continued)*

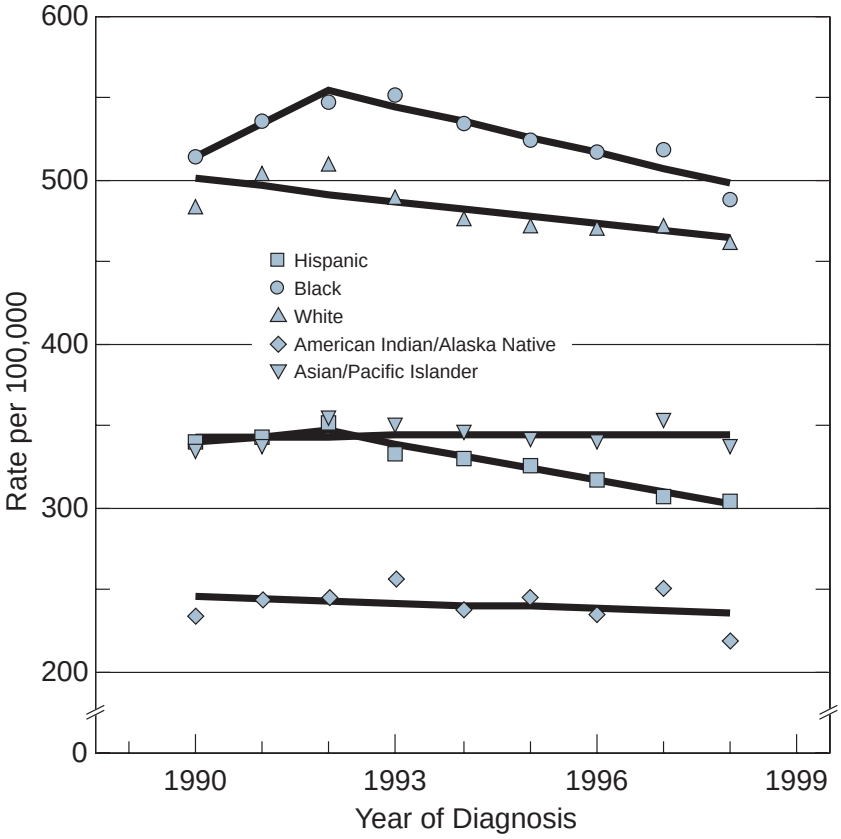
Key Issues

The rising lung cancer rate in women illustrates the need for more tobacco control efforts. This is especially important for teenage girls and young women, who are at higher risk than older women for starting to smoke and becoming addicted.

The recent increase in new breast cancers is unexplained and needs further study.

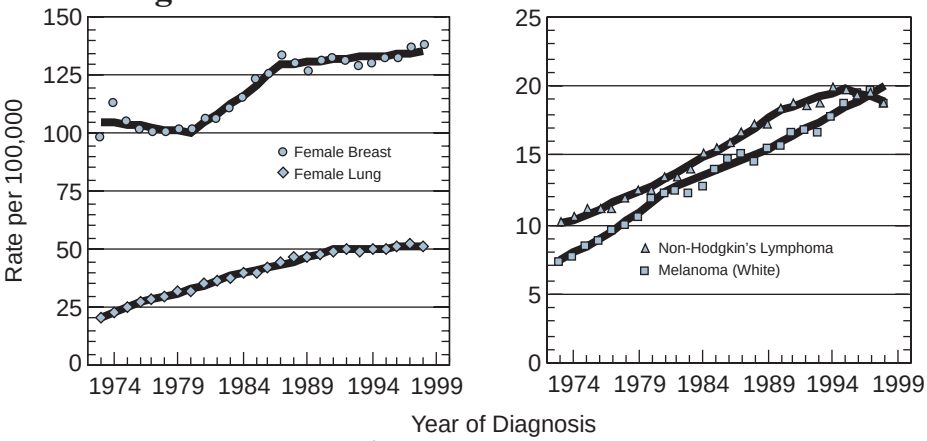
Although most major cancers are occurring less frequently, some are on the rise and require greater efforts at control. These include breast and lung cancer in women, as well as non-Hodgkin's lymphoma and melanoma in men and women *(Figure 21)*. The incidence of some rare cancers, including liver and esophagus, also is increasing.

Figure 20: Rates of New Cases of All Cancers, by Race/Ethnicity—1990-1998



Source: SEER Program, National Cancer Institute.
Rates are per 100,000 population and age-adjusted by 5-year age groups to the 2000 U.S. standard million.

Figure 21: Rates of Some Common Cancers That Are Increasing—1973-1998



Source: SEER Program, National Cancer Institute.
Rates are per 100,000 population and age-adjusted by 5-year age groups to the 2000 U.S. standard million.

Key Word: Stage

Stage at Diagnosis

There are fewer late-stage diagnoses for five major cancers.

Late-Stage Diagnosis of Cancer

Cancers can be diagnosed at different stages of their development. Stages at diagnosis may be expressed as numbers (I, II, III, or IV, for example) or by terms such as "localized," "regional," and "distant." The lower the number or the more localized the cancer, the better a person's chances of benefiting from treatment and being cured.

Tracking the rates of distant, or late, cancers is a good way to monitor the impact of cancer screening. When more cancers are detected in the early stages, fewer should be detected in the late stages.

Measure

Late-stage diagnosis rate: The number of new cancer cases diagnosed at a late stage, per 100,000 people per year. This report shows the rates for cancers of the prostate, colon, breast, rectum, and cervix.

Period – 1980-1998

Trends

Prostate: Falling. Late-stage prostate cancer has fallen dramatically since the early 1990s, following the introduction of the prostate-specific antigen (PSA) test.

Colon: Falling slightly

Breast: Stable

Rectum: Falling

Cervix: Falling

Most Recent Estimates

In 1998, these major cancers were diagnosed at a late stage at the following rates:

Prostate: 8 new cases per 100,000 people

Colon: 7 new cases per 100,000 people

Breast (female): 7 new cases per 100,000 people

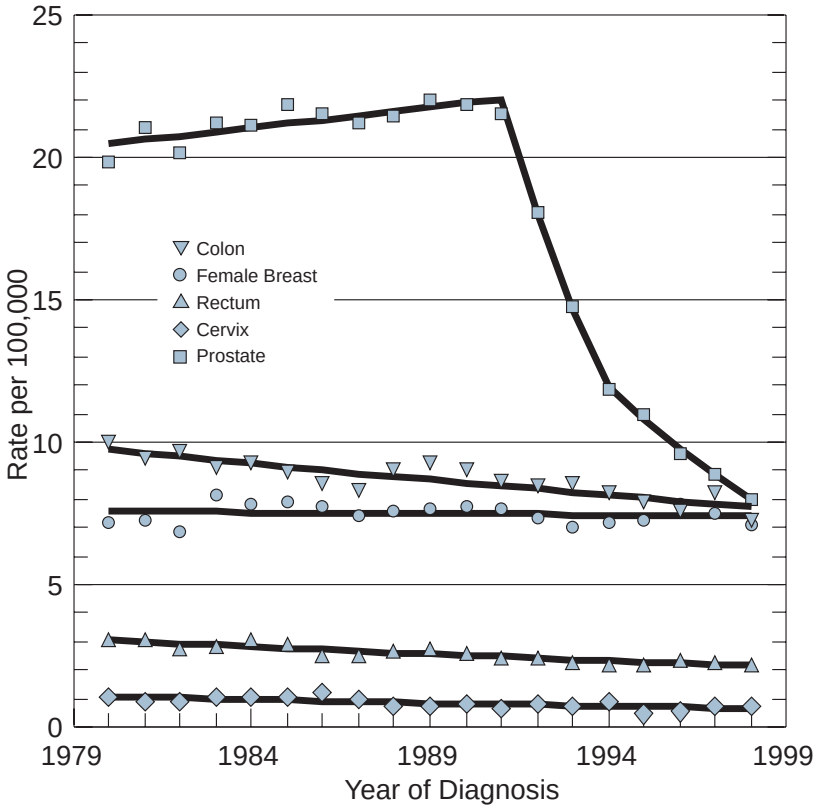
Rectum: 2 new cases per 100,000 people

Cervix: 0.7 new cases per 100,000 people

Healthy People 2010 Target

There is no Healthy People 2010 target for this measure.

Figure 22: Rates of New Cases of Late-Stage Disease, by Site—1980-1998



Source: SEER Program, National Cancer Institute.
Rates are per 100,000 population and age-adjusted by 5-year age groups to the 2000 U.S. standard million.

Key Word: Stage

Stage at Diagnosis *(continued)*

Groups at High Risk for Late-Stage Diagnosis

People who do not have regular, recommended cancer screening tests are at highest risk of being diagnosed with late-stage cancer.

Key Issues

A lower rate of diagnosis at late stages is an early sign of the effectiveness of screening efforts. These lower rates can be expected to occur before decreases in death rates are seen. For example, the drop in new cases of late-stage prostate cancer probably was an early indicator of lower death rates observed for this disease.

Important differences that exist among racial and ethnic groups in the percent of cases diagnosed at a late stage contribute to disparities in cancer mortality.

Key Word: Treatment

Treatment

Cancer treatment is improving—saving lives and extending survival for people with cancers at many sites, including the breast and colon, and for people with leukemias, lymphomas, and pediatric cancers. Clinical trials are the major avenue for discovering, developing, and evaluating new therapies. However, only about 3 percent of all adult cancer patients participate in clinical trials. It is important to increase physician and patient awareness of, and participation in, clinical trials if we are to test new treatments more rapidly, find more effective treatments, and broaden the options available to patients.

Regarding treatments already in use, the United States lacks a national data system for tracking those that reflect the best quality of care. Therefore, for most cancers we cannot yet illustrate with national data the extent to which cancer patients and their doctors are using the best treatments. This situation will begin to change in the near future.

NCI is working with many Federal and private partners to develop methods and data systems to facilitate tracking the quality of cancer care. This requires developing and reaching agreement by all major interested parties, public and private, on the best measures of cancer outcomes, such as survival and quality of life, as well as on measures of quality care, such as the receipt of effective treatment in a timely manner.

The research to generate such measures is underway. For prostate cancer, a major study on the quality-of-life outcomes among 3,500 men following diagnosis has provided important new information that will help men, their families, and physicians make better informed decisions about treatment. Research results on breast cancer treatment show that the use of breast-conserving surgery and radiation for older women increased markedly beginning in 1990. A new NCI initiative, the Cancer Care Outcomes Research and Surveillance Consortium, will provide more detailed information on how to link measures of quality care to outcomes important to patients as we develop systems for evaluating quality of care. Similar studies are being supported by major professional organizations as well as NCI.

These and other ongoing studies will provide much new information on treatment. Future editions of the *Cancer Progress Report* will include treatment trends for several cancer sites, including breast and colorectal cancer, where there are definitive treatment guidelines based on rigorous evidence of benefit to patients.

Key Words: Life After Cancer

Life After Cancer

More and more people are benefiting from the early detection of cancer and its successful treatment. These medical advances are improving both quality of life and length of survival, permitting many survivors to continue full and productive lives at home and at work.

Nevertheless, national data regarding life after cancer are limited. They include:

- Survival rates for cancer by each stage at diagnosis
- The estimated total number of survivors
- The economic impact of cancer

Few national measures are available that reflect health-related quality of life for cancer survivors, such as:

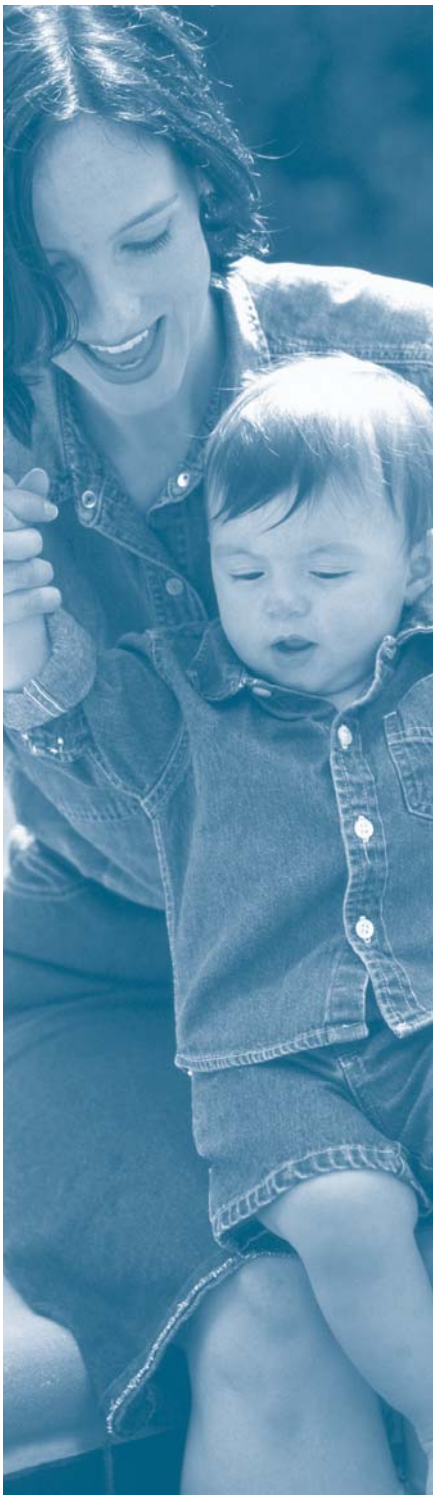
- The ability of cancer survivors to perform daily tasks
- The impact of cancer on employment and insurability
- The effects of cancer on family and loved ones

These and other measures related to life after cancer are subjects of intense research interest as well as matters of great concern to cancer survivors themselves. Future editions of the *Cancer Progress Report* will include additional measures in this area.

Key Word: Survival

Survival

Five-year survival rates have improved for all sites combined.



Cancer Survival

Advances in the ways cancer is diagnosed and treated have increased the number of people who are cured of cancer or who live long periods of time free of their disease. This report looks at trends in 5-year survival rates for cancer, the time period traditionally associated with cure. However, we know that some people have a recurrence of their cancer after 5 years.

In 1997, more than 7 million Americans were alive who had been diagnosed with cancer and had survived for up to 20 years. Of these, more than 1.5 million had been diagnosed with breast cancer, and more than 1 million had been diagnosed with prostate cancer. An additional unknown number of people—perhaps around 1 million—were alive in 1997 who had survived more than 20 years after cancer.

Measure

Five-year relative cancer survival rate: The proportion of patients surviving cancer 5 years after their diagnosis. This report shows survival rates for cancers of the prostate, breast, colon/rectum, and lung, and for all cancers combined.

Period – 1975-1993

(year diagnosed)

Trends – Rising overall

All sites: Rising slightly, then rising

Prostate: Rising slightly, then rising

Breast: Stable, rising slightly, rising, then stable

Colorectal: Rising, then falling slightly, though the latter trend is not statistically significant

Lung: Rising slightly

Five-year survival rates are highest for prostate and breast cancers and lowest for lung cancer.

Most Recent Estimate

For people diagnosed with cancer (all sites) in 1993, 62 percent survived cancer after 5 years.

Healthy People 2010 Target

Increase to 70 percent the proportion of cancer survivors who are living 5 years or longer after diagnosis.

Key Word: Survival

Survival *(continued)*

Groups at High Risk for Poor Survival

People with cancers diagnosed at late stages have the worst chance of survival.

Some cancers, like pancreatic cancer and lung cancer, are especially aggressive and have poor survival no matter what the stage at diagnosis.

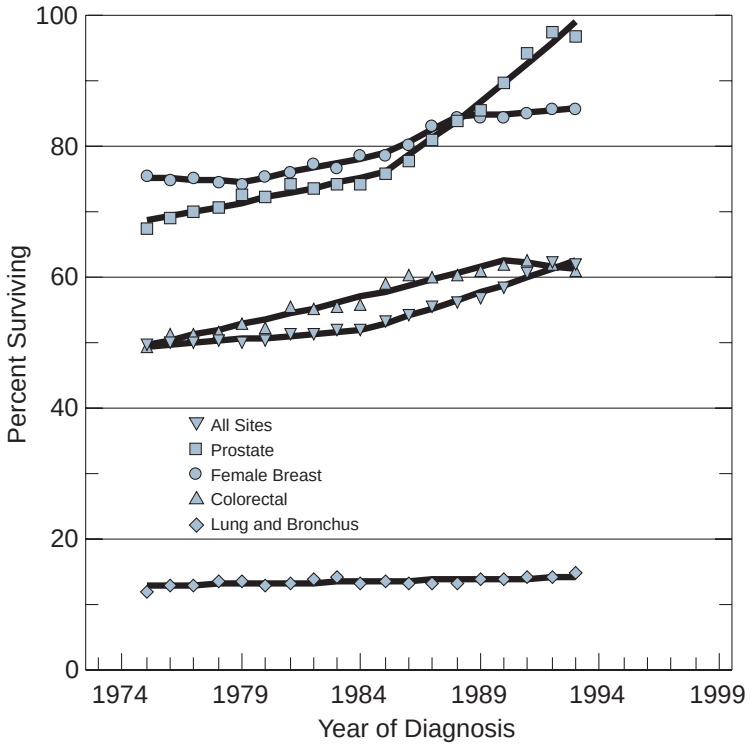
For other cancers that have good results from treatment, such as breast and colorectal cancers, patients who had not taken advantage of screening opportunities or who have poor access to health care are at highest risk.

Key Issues

Improved survival rates result from both early detection and better treatments. It is difficult to separate out the contribution of each factor.

Despite the positive trends in 5-year survival for three of the most common cancers, lung cancer survival rates are low.

Figure 23: 5-Year Relative Survival Rates, by Site—1975-1993



Source: SEER Program, National Cancer Institute.

Key Word: Costs

Costs of Cancer Care

Cancer treatment spending has risen but remains stable in proportion to total U.S. treatment spending.

The financial costs of cancer treatment are a burden to people diagnosed with cancer, their families, and society as a whole. Cancer treatment accounted for about $41 billion in 1995, the most recent year for which there is information. This is just under 5 percent of total U.S. spending for medical treatment. In the 10 years from 1985 to 1995, the overall costs of treating cancer more than doubled.

High-quality cancer care is not necessarily the most expensive care. It would be desirable to see the overall costs of cancer treatment decrease relative to total health care costs. In the near future, however, these costs may increase as the population ages and the absolute number of people treated for cancer increases. Costs also are likely to increase at the individual level as new, more advanced, and more expensive treatments are adopted as standards of care.

NCI will continue to monitor cancer costs and track the percentage of total medical costs accounted for by cancer care. Over the last three decades, this percentage has remained remarkably constant.

As total spending for medical treatment rose between 1963 and 1995, so did spending for cancer treatment.

Year	Cancer Treatment Spending (billions)	Total Health Care Spending (billions)	Percent of Cancer Treatment Spending to Total
1963	$1.3	$29.4	4.4%
1972	$3.9	$78.0	5.0%
1980	$13.1	$217.0	6.0%
1985	$18.1	$376.4	4.8%
1990	$27.5	$614.7	4.5%
1995	$41.2	$879.3	4.7%

Table 1: National Cancer Treatment Expenditures in Billions of Dollars–1963-1995

Source: Brown ML, Lipscomb J, Snyder C. The burden of illness of cancer: economic cost and quality of life. Annual Review of Public Health 2001;22:91-113.

Spending for each year is expressed in current dollars for that year. While cancer treatment costs increased dramatically between 1963 and 1995, the proportion of these to all health care expenditures remained stable. Cancer spending in this chart does not include screening, which cost an additional $5 billion to $10 billion in 2000.

Key Word: Costs

Costs of Cancer Care *(continued)*

Treatment expenditures for each of the four most common cancers are remarkably similar. However, individual costs for other cancers based on Medicare data show wide variation by type of cancer.

	Percent of all new cancers (1998)	Expenditures (In billions of 1996 dollars)	Percent of all cancer treatment expenditures	Average Medicare payments per individual in first year following diagnosis
Breast	18.2%	$5.4	13.1%	$9,230
Colorectal	11.7%	$5.4	13.1%	$21,608
Lung	12.5%	$4.9	12.1%	$20,340
Prostate	13.6%	$4.6	11.3%	$8,869
Lymphoma	4.2%	$2.6	6.3%	$17,217
Bladder	4.0%	$1.7	4.2%	$10,770
Cervix	2.3%	$1.7	4.1%	$13,083
Head/Neck	3.3%	$1.6	4.0%	$14,788
Leukemia	2.1%	$1.2	2.8%	$11,882
Ovary	1.7%	$1.5	3.7%	$32,340
Melanoma	5.2%	$0.7	1.7%	$3,177
Pancreas	2.1%	$0.6	1.5%	$23,504
Esophagus	0.9%	$0.4	0.9%	$25,886
All Other	18.1%	$8.7	21.2%	$17,201
Total	100.0%	$41.0	100%	

Table 2: Estimates of National Expenditures for Medical Treatment for the 13 Most Common Cancers–Based on Cancer Prevalence in 1996 and Cancer-Specific Costs for 1995-1998, Expressed in 1996 Dollars.
Source: Brown ML, Riley GF, Schussler N, Etzioni R. Estimating health care cost from SEER-Medicare data. Submitted to Medical Care.

The first-year costs for lung and colorectal cancer are higher because screening is not commonly used in the detection of these cancers. If screening for colorectal cancer were performed as recommended, the proportion of cases presenting at advanced stages—when treatment is more extensive and costly—would be reduced.

Medicare does not cover certain cancer care expenses, such as oral medicines commonly used to treat cancers of the breast and prostate. These out-of-pocket costs may add as much as 10 percent to the estimates shown above.

Direct medical expenditures are only one component of the total economic burden of cancer. The indirect costs include losses in time and economic productivity resulting from cancer-related illness and death. Based on 1990 data, the total economic burden of cancer in 1996 was an estimated $143.5 billion.

Key Words: End of Life

End of Life

The ultimate measure of our Nation's success against cancer is how far we can lower the death rate from this group of dread diseases. This final section of *Cancer Progress Report 2001* provides national data not only on cancer mortality by major sites, but also in terms of years of life lost to cancer—a measure that emphasizes the tragedy of common cancers that strike people at a relatively young age.

As highlighted at the beginning of this report, the news is good. For the first time since the Government began collecting mortality data early in the last century, cancer death rates began to decline in 1992. It is our job as a Nation to maintain and accelerate this trend. Future editions of this report will continue to document how we are doing in the ongoing battle against deaths from cancer.

Key Word: Mortality

Mortality

After several decades of steady increases, cancer death rates began to decline in the early 1990s.

Measuring Cancer Deaths

In 1998, cancers of the breast, prostate, lung, and colon/rectum accounted for more than half of all cancer deaths in the United States. Lung cancer alone claimed more than one-fourth of the lives lost to cancer. It is projected that in 2001, there will be 553,400 cancer deaths overall, including 157,400 deaths from lung cancer; 56,700 from cancers of the colon/rectum; 40,200 from female breast cancer; and 31,500 from prostate cancer.

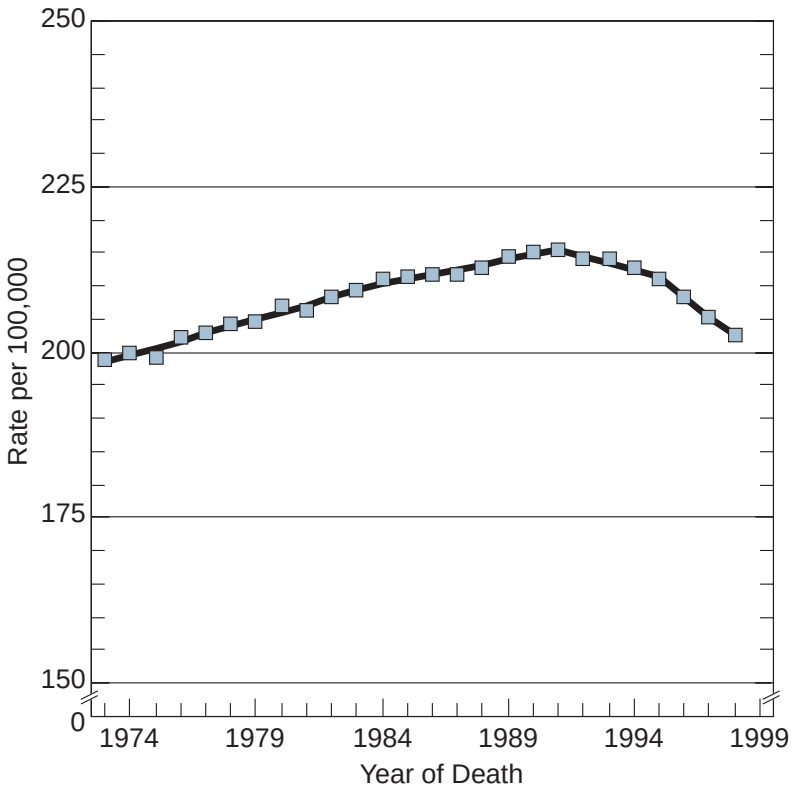
Cancer mortality usually is measured as the annual number of deaths from cancer for every 100,000 people.

Measure

Mortality rate: The number of cancer deaths per 100,000 people per year.

Period – 1973-1998

Figure 24: Rates of Deaths for All Cancers—1973-1998



Source: National Center for Health Statistics data as analyzed by the National Cancer Institute.
Rates are per 100,000 population and age-adjusted by 5-year age groups to the 2000 U.S. standard million.

Key Word: Mortality

Trends – Falling slightly

Cancer death rates rose over the long term until the mid-1980s, when they became stable. The rates began falling in the early 1990s. *(Figure 24.)*

Death rates for the four most common cancers began to fall between 1984 and 1991 *(Figure 25)*.

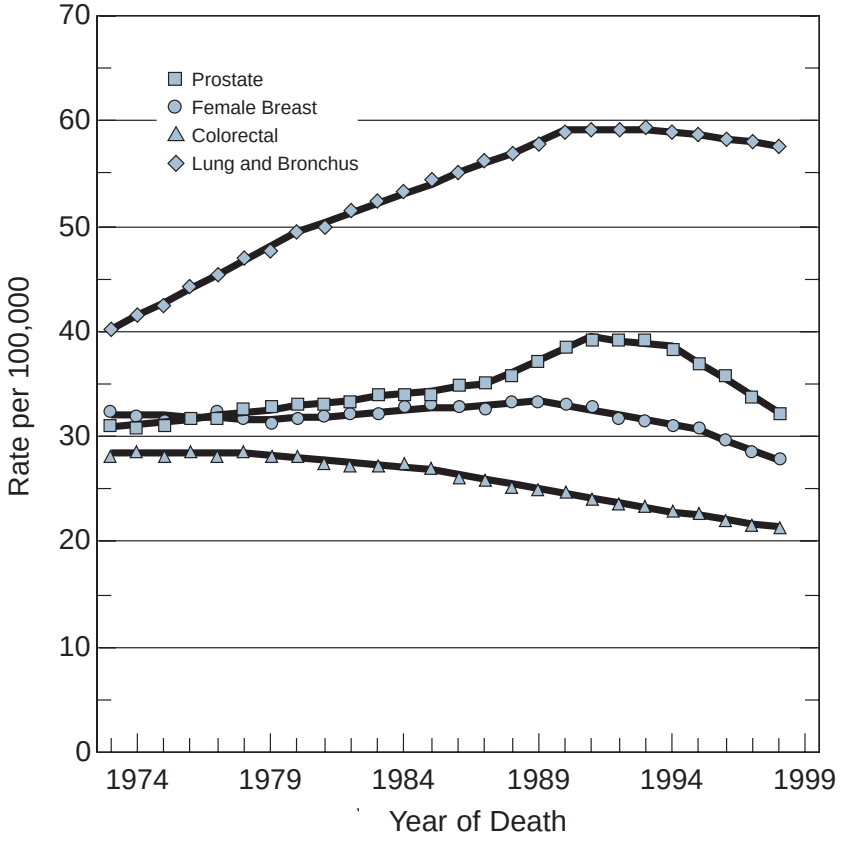
Most Recent Estimate

In 1998, the death rate for all cancers was 202.6 per 100,000 people *(Figure 24)*.

Healthy People 2010 Target

Reduce the overall cancer death rate to 159.9 cancer deaths per 100,000 people.

Figure 25: Cancer Death Rates for Common Cancers—1973-1998



Source: National Center for Health Statistics data as analyzed by the National Cancer Institute.
Rates are per 100,000 population and age-adjusted by 5-year age groups to the 2000 U.S. standard million.

Key Word: Mortality

Mortality *(continued)*

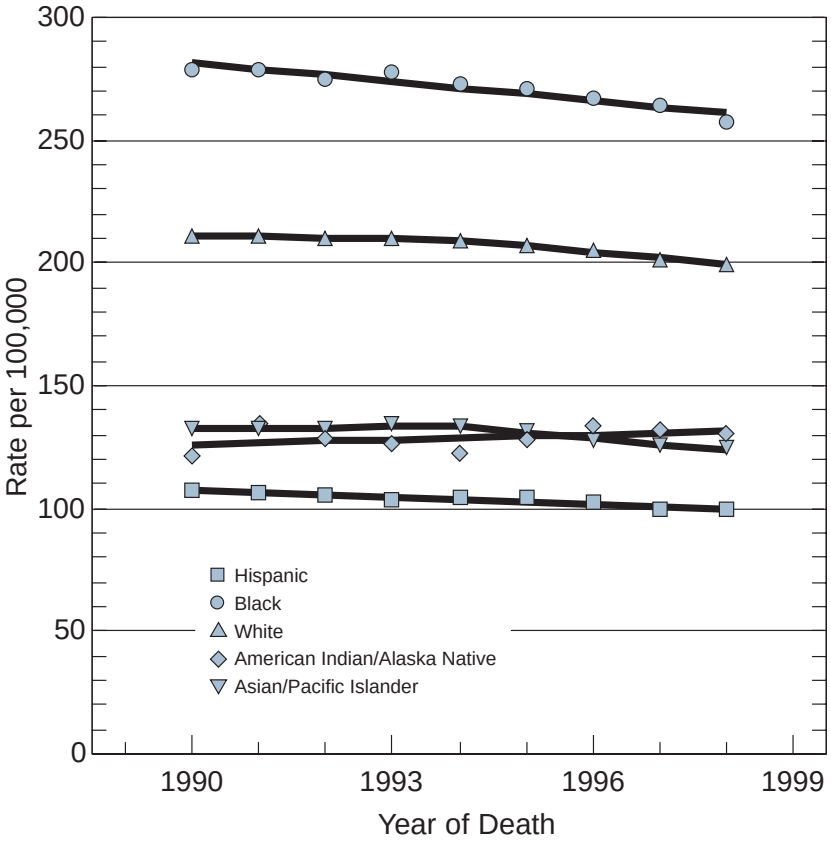
Groups at High Risk for Cancer Deaths

Blacks have the highest overall rates for cancer deaths, followed by Whites *(Figure 26)*.

Key Issues

Although overall death rates are on the decline, deaths from some cancers, such as esophageal and non-Hodgkin's lymphoma, are increasing. Death rates among American Indians/Alaska Natives also are increasing.

Figure 26: Rates of Deaths for All Cancers, by Race/Ethnicity—1990-1998



Source: National Center for Health Statistics data as analyzed by the National Cancer Institute.
Rates are per 100,000 population and age-adjusted by 5-year age groups to the 2000 U.S. standard million.

Key Word: PYLL

Person-Years of Life Lost

Cancer is responsible for more estimated years of life lost than any other cause of death.

Person-Years of Life Lost to Cancer

Mortality rates alone do not give a complete picture of the burden of cancer deaths. Another useful measure is person-years of life lost (PYLL)—the years of life lost due to early death from a particular cause. PYLL helps to describe the extent to which life is cut short by cancer. On average, each person who dies from cancer loses an estimated 15 years of life.

Measure

PYLL due to cancer: The difference between the actual age of death due to a cancer and the expected age of death.

Period – 1998

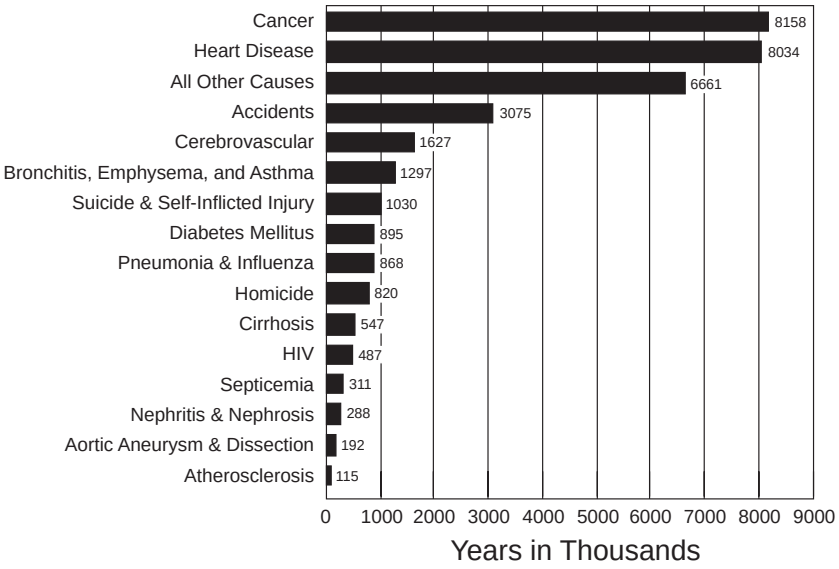
Trend – No trend data are available.

Most Recent Estimates

In 1998, cancer deaths were responsible for 8 million PYLL. This is more than heart disease or any other cause of death. *(Figure 27.)*

Also in 1998, among cancers, lung cancer accounted for 2 million PYLL, the most by far of any cancer. In contrast, prostate cancer, which primarily affects older men, accounted for fewer than 300,000 PYLL. *(Figure 28.)*

Figure 27: Person-Years of Life Lost Due to Major Causes of Death in U.S.—1998



Source: National Center for Health Statistics (NCHS) public-use file and NCHS 1997 Life Tables.

Key Word: PYLL

Person-Years of Life Lost *(continued)*

Healthy People 2010 Target

There is no Healthy People 2010 target for this measure.

Groups at High Risk for the Most PYLL

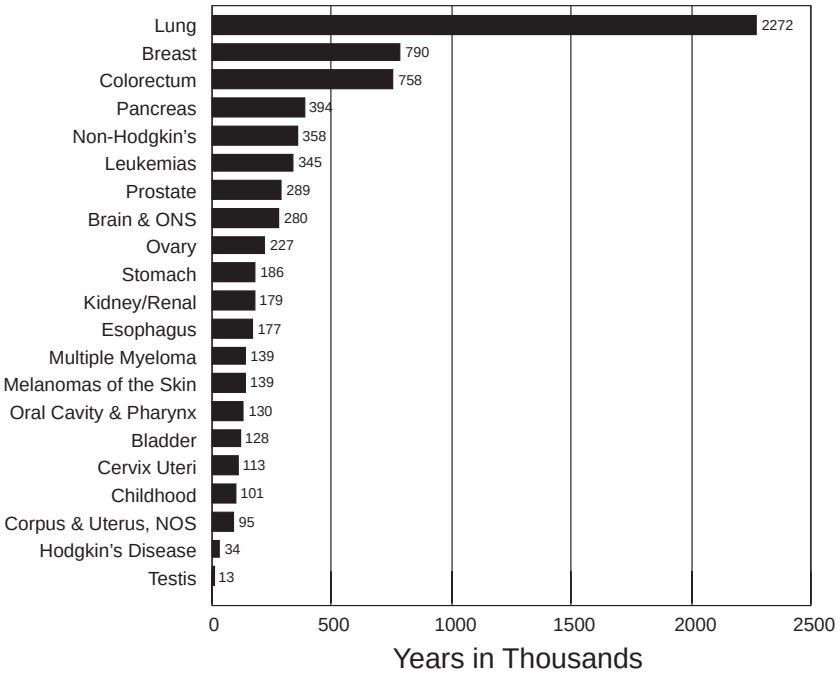
Cancers that are both common and from which there is poor survival are responsible for the most PYLL. Breast and colorectal cancers are also common cancers that strike people at a relatively young age and cause many years of life lost.

Deaths from childhood cancers, which are uncommon, lead to the most years of life lost for the individual child, but contribute only a small percentage to total PYLL.

Key Issues

The greatest impact on reducing the number of years lost to cancer will come from progress against common cancers—especially lung, breast, and colorectal cancers.

Figure 28: Person-Years of Life Lost Due to Cancer—1998



Source: National Center for Health Statistics (NCHS) public-use file and NCHS 1997 Life Tables.

Appendix A: Acknowledgments

NCI wishes to acknowledge the following Federal agencies as sources for the data used in this report:

Environmental Protection Agency

National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention

National Center for Health Statistics, Centers for Disease Control and Prevention

National Institute on Alcohol Abuse and Alcoholism

Office of Disease Prevention and Health Promotion, U.S. Department of Health and Human Services

Substance Abuse and Mental Health Services Administration

U.S. Department of Agriculture

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Appendix A: Acknowledgments *(continued)*

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Appendix B: Dictionary of Terms

cancer continuum
The spectrum of cancer-related experience, including prevention, early detection, diagnosis, treatment, life after cancer, and end of life.

carcinogen
Any substance that causes cancer.

clinical trial
A research study that tests how well new medical treatments or other interventions work in people.

esophagus
The tube through which food passes from the mouth to the stomach.

fecal occult blood test (FOBT)
An exam of the stool that can find hidden blood, a sign of possible colorectal cancer. The FOBT also can find bleeding from other disorders.

incidence rate (for cancer)
The number of new cancer cases per 100,000 people, per year.

invasive cancer
Cancer that has spread beyond the layer of tissue in which it developed into surrounding, healthy tissue.

larynx
The voice box.

leukemia
Cancer of the blood-forming tissue.

mammography
The use of x-rays to create a picture of the breast (mammogram) that can show signs of breast cancer before it can be felt.

mortality rate (for cancer)
The number of cancer deaths per 100,000 people, per year.

outcomes
The outcomes of cancer care are the end results of interventions to prevent, detect, and treat cancer on the health and well-being of people and populations. Such outcomes include survival and disease-free survival, health-related quality of life (including ability to carry out usual activities), patient symptoms (such as pain and shortness of breath), economic burden, and patient and family experience and satisfaction with care.

Pap smear
The collection of cells from the cervix (the lower, narrow end of the uterus that forms a canal between the uterus and vagina) and their examination under a microscope. The Pap smear (or Pap test) is used to detect changes that may be cancer or may lead to cancer.

pharynx
The throat.

screening
Using tests to check for a disease in its early stage, when there are no symptoms. For example, mammography is a screening test that can find breast cancer before it can be felt.

sigmoidoscopy
An exam of the rectum and the lower part of the colon with a thin, flexible, lighted tube to find polyps, abnormal areas, and tumors. Also called proctosigmoidoscopy.

socioeconomic status
A measure of a person's relative standing in society, frequently based on a combination of income, education, and occupation.

statistical significance (of a trend)
Results of a test to find out if a trend really is rising or falling, or whether any apparent rise or fall can be explained by random variation in the measurement.

survival (cancer)
As used in this report, the proportion of cancer patients surviving cancer 5 years after their diagnosis.

trend
The general direction (for example, rising, falling, or stable) of change over time.

Appendix C: References

Following are selected major references used in preparing this report. See the online version for links to more references and background information.
http://progressreport.cancer.gov

The data referenced here will not always match the data in the *Cancer Progress Report*. That is because most of this report's data were age-adjusted to the year 2000 standard population in order to be compatible with data presented in Healthy People 2010.

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Appendix D: Methodology for Characterizing Trends

In order to obtain a consistent characterization of population trends in factors related to the prevention, early detection, or treatment of cancer, the joinpoint statistical methodology was used in this report (Kim et al., 2000). This methodology characterizes a trend using joined linear segments on a logarithmic scale, and has proven useful in characterizing trends in cancer incidence and mortality rates (e.g., Cancer statistics review: 1973-1997).

The joinpoint software (Joinpoint Version 2.5, 2000) uses statistical criteria to determine the fewest number of segments that are necessary to characterize a trend, where the segments begin and end, and the annual percent change (APC) for each segment (a linear trend on a log scale implies a constant annual percent change). In addition, a 95 percent confidence interval around the APC was used to determine if the APC for each segment differed significantly from zero. For the purposes of this report the maximum number of possible segments was limited to three. To avoid statistical anomalies, segments had to contain at least three observed data points, and no segment could begin or end closer than three data points from the beginning or end of the data series. For factors related to the prevention, early detection, or treatment of cancer, the data points within each series were not differentially weighted because they arose from surveys or other data sources that did not have dramatically different sample sizes across the years, and in some cases the weights would be difficult to obtain. When characterizing trends in cancer incidence or mortality, weights were used that are derived from the standard Poisson assumption. Using the results of these analyses we characterize trends with respect to both their public health importance and statistical significance. If a trend was:

- Changing less than 0.5 percent per year, we characterized it as ***STABLE*** ($-0.5 < APC < 0.5$).
- Changing more than 0.5 percent per year but less than 1.5 percent per year, we characterized it as ***RISING OR FALLING SLIGHTLY*** ($-1.5 < APC \leq -0.5$ or $0.5 \leq AAPC < 1.5$).
- Changing more than 1.5 percent per year, we characterized it as ***RISING OR FALLING*** ($AAPC \leq -1.5$ or $AAPC \geq 1.5$).
- Rising or falling at 0.5 percent per year or more, but the APC was not statistically different from zero, we noted that the trend was not statistically significant.

While these characterizations are somewhat arbitrary, they at least provide a consistent method to characterize the trends across disparate measures. By definition (since we constrained the joinpoint models to those where no segment could begin or end closer than three data points from the beginning or end of the data series), for situations in which there were four or fewer data points in the series, only one segment (i.e., a model with no joinpoints) could be fit, and for five data points only one possible joinpoint could be fit at the middle data point. To avoid these situations, for four or five data points we simply fit a regression line on the log of the response to determine the APC and its statistical significance. In one case the fit of such a line to the observed data was not good and may have been misleading. This was for "percent of high school students (grades 9-12) who were current users of cigarettes (1991-1999)," where the 1999 data point appeared to show a decline after a long-term rise. Thus the trend line was only fit through the first four data points (1991-1997). The dotted line connecting the trend line from 1991 through 1997 to the 1999 data point suggests a change in trend, which must be verified as more data accumulates. For two or three data points we connected the data points to determine the APC for each time period, and then employed a two-sample test using the survey weights to determine the statistical significance of the change in period.

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Appendix E: Cancer Incidence and Mortality Rates Age-Adjusted to the 1970 and 2000 Standards, United States 1998

	All		Male		Female		White male		White female		Black male		Black female	
	AA 1970	AA 2000	AA 1970	AA 2000	AA 1970	AA 2000	AA 1970	AA 2000	AA 1970	AA 2000	AA 1970	AA 2000	AA 1970	AA 2000
Incidence	Rate	Rate	Rate	Rate	Rate	Rate	Rate	Rate	Rate	Rate	Rate	Rate	Rate	Rate
All sites	395.3	471.4	452.2	544.4	355.9	424.1	447.7	539.9	362.4	431.3	543.8	642.1	334.1	398.0
Lung	54.8	64.9	69.8	84.2	43.4	50.9	68.4	82.8	44.8	52.5	100.6	118.8	47.9	56.0
Breast	63.8	76.0	0.9	1.1	118.1	139.1	1.0	1.2	121.3	142.8	0.7	0.8	99.2	117.1
Cervix uteri	—	—	0.0	0.0	7.5	9.0	0.0	0.0	6.7	8.1	0.0	0.0	10.5	12.8
Colorectal	44.1	55.4	51.7	65.0	38.2	48.3	51.3	64.8	37.6	47.7	54.9	67.4	43.8	53.6
Prostate	—	—	137.3	161.4	0.0	0.0	130.9	153.9	0.0	0.0	216.2	251.1	0.0	0.0
Melanoma	14.3	16.9	17.3	20.8	12.0	14.2	19.3	23.1	13.6	16.0	1.1	1.4	1.0	1.2
Mortality	Rate	Rate	Rate	Rate	Rate	Rate	Rate	Rate	Rate	Rate	Rate	Rate	Rate	Rate
All sites	161.5	202.6	198.5	253.5	135.3	169.0	193.6	247.8	133.9	167.4	277.3	348.6	163.0	201.6
Lung	47.9	57.6	65.4	80.1	34.6	41.5	64.2	78.7	35.3	42.2	88.8	106.5	34.7	41.2
Breast	12.6	15.8	0.2	0.3	22.7	27.9	0.2	0.3	22.2	27.3	0.4	0.5	29.6	36.0
Cervix uteri	—	—	0.0	0.0	2.5	3.0	0.0	0.0	2.2	2.7	0.0	0.0	4.9	6.0
Colorectal	16.3	21.4	19.6	25.6	13.7	18.3	19.2	25.1	13.2	17.7	26.2	33.4	19.4	25.3
Prostate	—	—	21.5	32.2	0.0	0.0	19.6	29.6	0.0	0.0	48.7	70.6	0.0	0.0
Melanoma	2.3	2.8	3.3	4.1	1.4	1.8	3.7	4.6	1.6	2.0	0.3	0.4	0.4	0.6

Source: Incidence is for 9% of the U.S. population from the National Cancer Institute SEER Program, and mortality is for the total U.S. population from the National Center for Health Statistics. Rates are per 100,000 and are age-adjusted to 1970 or 2000 U.S. standard million population as specified.

Notes

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