Special Section:
PROSTATE CANCER, p. 20

CANCER FACTS & FIGURES–1998

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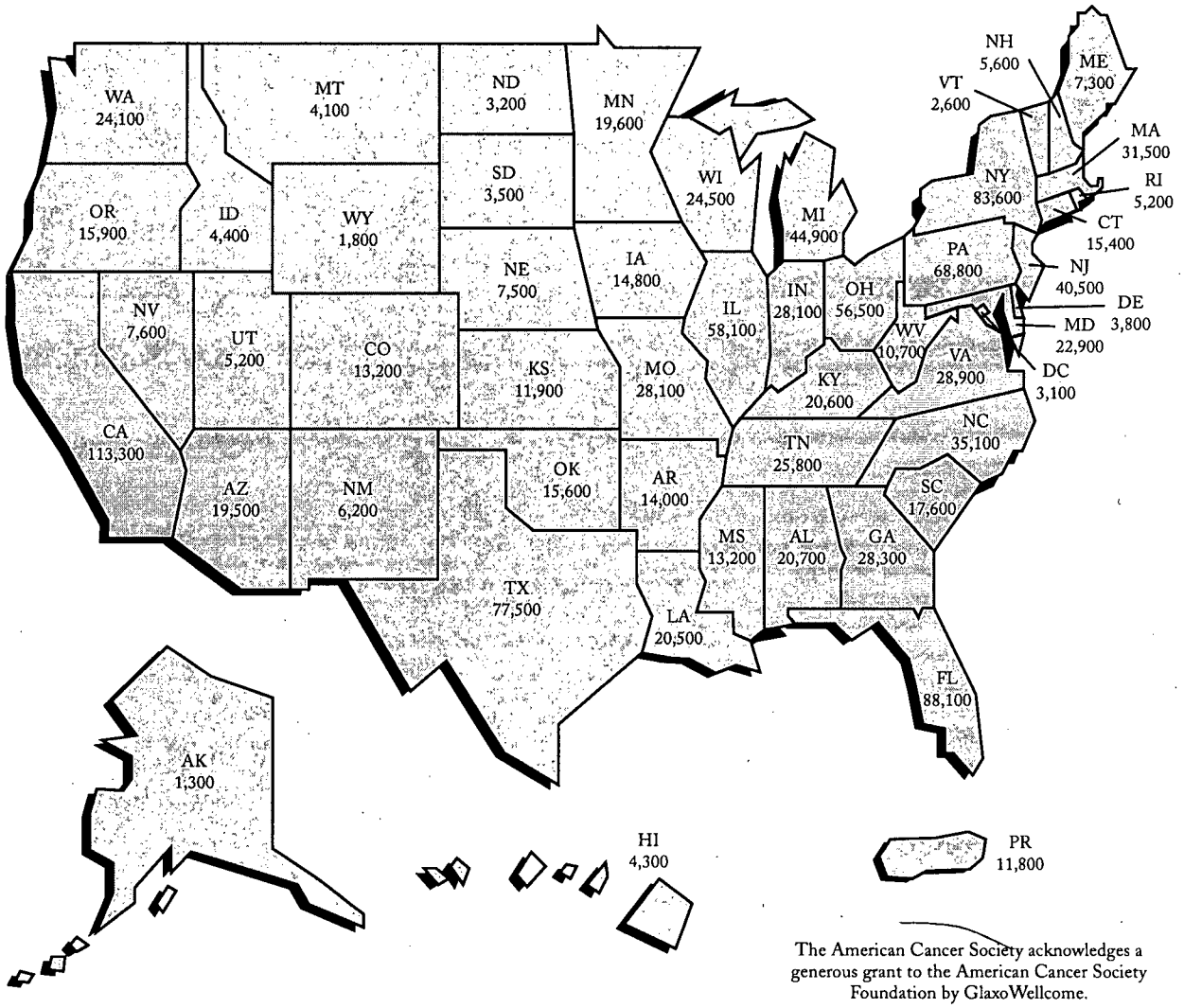

The American Cancer Society acknowledges a generous grant to the American Cancer Society Foundation by GlaxoWellcome.

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The American Cancer Society is the nationwide, community-based, voluntary health organization dedicated to eliminating cancer as a major health problem by preventing cancer, saving lives and diminishing suffering from cancer, through research, education, advocacy, and service.

AMERICAN CANCER SOCIETY®

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CANCER: BASIC FACTS

What Is Cancer?

Cancer is a group of diseases characterized by uncontrolled growth and spread of abnormal cells. If the spread is not controlled, it can result in death.

What Causes Cancer?

Cancer is caused by both external (chemicals, radiation, and viruses) and internal (hormones, immune conditions, and inherited mutations) factors. Causal factors may act together or in sequence to initiate or promote carcinogenesis. Ten or more years often pass between exposures or mutations and detectable cancer.

Can Cancer Be Prevented?

All cancers caused by cigarette smoking and heavy use of alcohol could be prevented completely. The ACS estimates that in 1998 about 175,000 cancer deaths are expected to be caused by tobacco use and an additional 19,000 cancer deaths are related to excessive alcohol use, frequently in combination with tobacco use. Many cancers that are related to dietary factors could also be prevented. Scientific evidence suggests that up to one-third of the 564,800 cancer deaths that are expected to occur in the US this year are related to nutrition. In addition, many of the one million skin cancers that are expected to be diagnosed in 1998 could have been prevented by protection from the sun's rays.

Screening examinations, conducted regularly by a health care professional can result in the detection of cancers of the breast, colon, rectum, cervix, prostate, testis, tongue, mouth, and skin at earlier stages, when treatment is more likely to be successful. Self examinations for cancers of the breast and skin may also result in detection of tumors at earlier stages. The nine screening-accessible cancers listed above account for approximately half of all new cancer cases. The 5-year relative survival rate for these cancers is about 80%. If all Americans participated in regular cancer screenings, this rate could increase to more than 95%.

How Is a Person's Cancer Treated?

By surgery, radiation, chemotherapy, hormones, and immunotherapy.

Who Is at Risk of Developing Cancer?

Anyone. Since the occurrence of cancer increases as individuals age, most cases affect adults middle-aged or older. Cancer researchers use the word risk in different ways. *Lifetime risk* refers to the probability that an individual, over the course of a lifetime, will develop cancer or die from it. In the US, men have a 1 in 2 lifetime risk of developing cancer, and for women the risk is 1 in 3.

Relative risk is a measure of the strength of the relationship between risk factors and the particular cancer. It compares the risk of developing cancer in persons with a certain exposure or trait to the risk in persons who do not have this exposure or trait. For example, smokers have a 10-fold relative risk of developing lung cancer compared with nonsmokers. This means that smokers are about 10 times more likely to develop lung cancer (or have a 900% increased risk) than nonsmokers. Most relative risks are not this large. For example, women who have a first-degree (mother, sister, or daughter) family history of breast cancer have about a twofold increased risk of developing breast cancer compared with women who do not have a family history. This means that women with a first-degree family history are about two times or 100% more likely to develop breast cancer than women who do not have a family history of the disease.

How Many People Alive Today Have Ever Had Cancer?

The National Cancer Institute estimates that approximately 8 million Americans alive today have a history of cancer. Some of these individuals can be considered cured, while others still have evidence of cancer.

How Many New Cases Are Expected to Occur This Year?

About 1,228,600 new cancer cases are expected to be diagnosed. Since 1990, approximately 11 million new cancer cases have been diagnosed. These estimates do not include carcinoma in situ (noninvasive cancer) except for urinary bladder, or basal and squamous cell skin cancers. Over 1 million cases of basal and squamous cell skin cancer are expected to be diagnosed this year.

How Many People Are Expected to Die of Cancer?

This year about 564,800 Americans are expected to die of cancer—more than 1,500 people a day. Cancer is the second leading cause of death in the US, exceeded only by heart disease. One of every four deaths in the US is from cancer. Since 1990, there have been approximately 5 million cancer deaths.

What Is the National Cancer Death Rate?

Between 1991 and 1995, the national cancer death rate fell 2.6%. Most of the decline can be attributed to decreases in mortality from cancers of the lung,

colon-rectum, and prostate in men, and breast, colon-rectum, and gynecologic sites in women. The declines in mortality were greater in men than in women, largely because of changes in lung cancer rates; greater in young patients than in older patients; and greater in African Americans than in whites although mortality rates remain higher in African Americans.

How Many People Are Surviving Cancer?

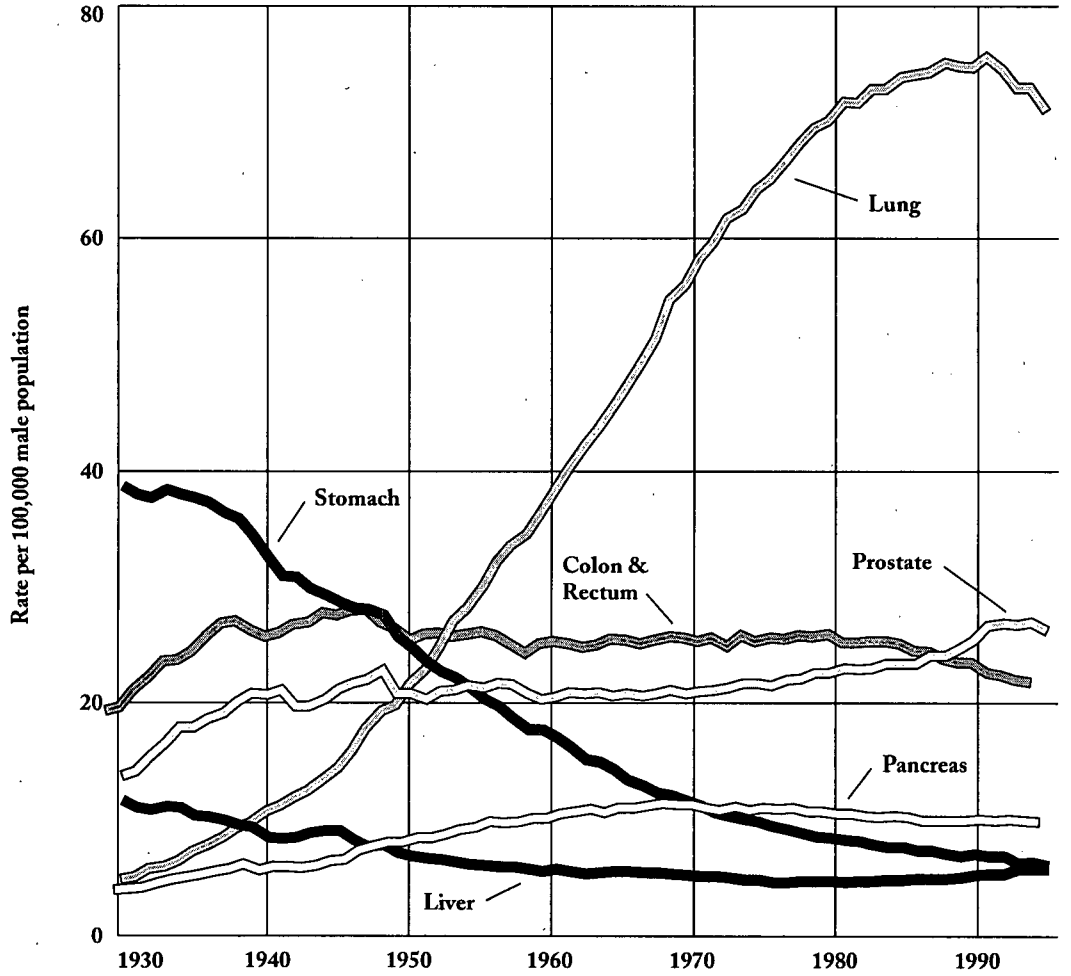
In the early 1900s, few cancer patients had any hope of long-term survival. In the 1930s, about one in four was alive five years after treatment. About 491,400 Americans, or 4 of 10 patients who get cancer this year, are expected to be alive five years after diagnosis.

This 4 in 10, or about 40% is called the *observed* survival rate. When adjusted for normal life expectancy (factors such as dying of heart disease, accidents, and diseases of old age), a *relative* 5-year survival rate of 58% is seen for all cancers. Five-year relative survival rates, commonly used to monitor progress in early detection and treatment of cancer, include persons who are living five years after diagnosis, whether in remission, disease-free, or under treatment. While these rates provide some indication about the average survival experience of cancer patients in a given population, they are less informative when used to predict individual prognosis.

What Is the Difference Between In Situ and Invasive Cancer?

Carcinoma in situ (noninvasive cancer) is the earliest

Age-Adjusted Cancer Death Rates,* Males by Site, US, 1930-1994



*Rates are per 100,000 and are age-adjusted to the 1970 US standard population.

Note: Due to changes in ICD coding, numerator information has changed over time. Rates for cancers of the liver, lung, and colon and rectum are affected by these coding changes.

American Cancer Society, Surveillance Research, 1998. Data source: Vital Statistics of the United States, 1997.

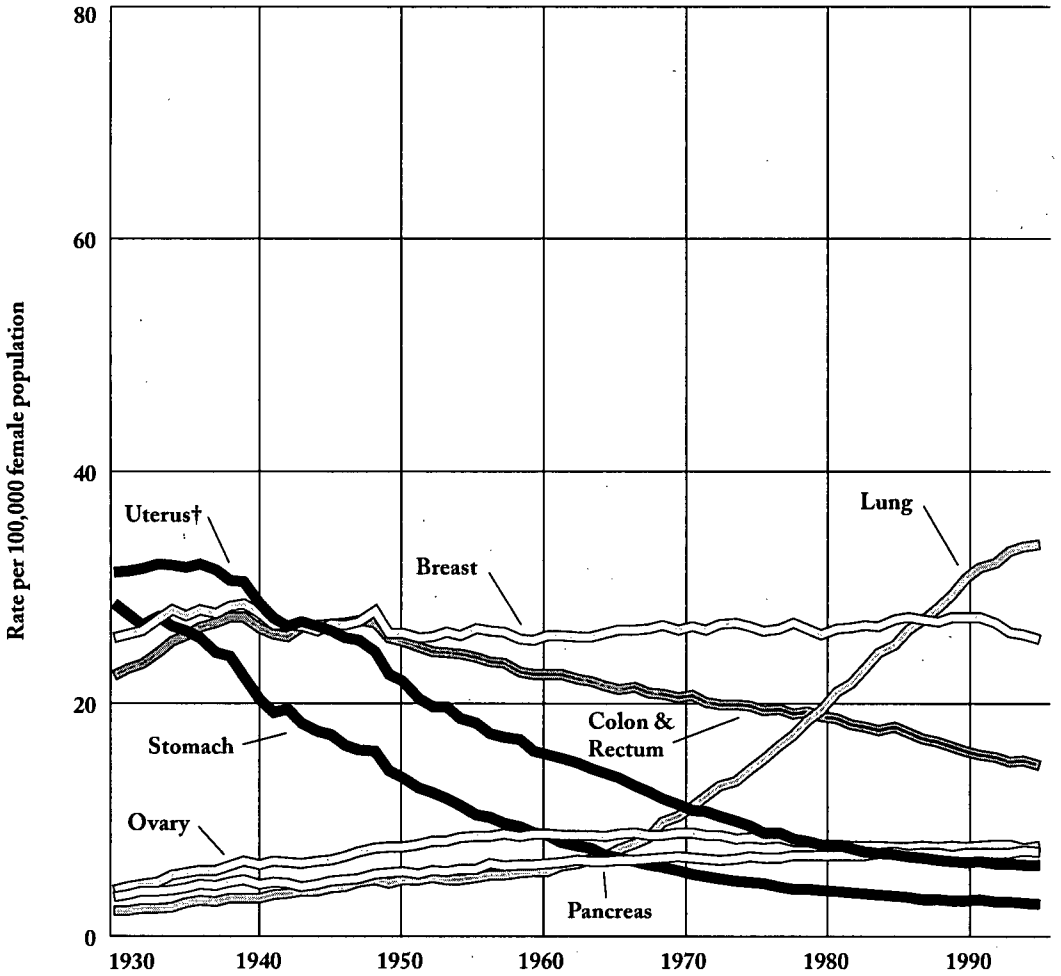
stage of cancer. At this stage, the cancer cells are only in the layer of cells they developed in, and have not yet spread to other parts of that organ or elsewhere in the body. Most in situ cancers are curable if they are treated before they progress to invasive cancer. For this publication, unless otherwise specified, statistics are for invasive cancers only. Because most in situ cancers cause no symptoms and do not always progress to invasive cancers, they cannot be counted as accurately as invasive cancers.

What Are the Costs of Cancer?

The financial costs of cancer are great both to the individual and to society as a whole. The National Cancer Institute estimates overall annual costs for cancer at $107 billion; $37 billion for direct medical costs, $11 billion for morbidity costs (cost of lost productivity), and $59 billion for mortality costs. Treatment of breast, lung, and prostate cancers account for over half of the direct medical costs.

The debate on health care system reform highlights the cost of treating cancer in a new way. According to 1994 data, about 18% of Americans under age 65 have no health insurance, and about 14% of older persons have only Medicare coverage. The proportion of the population that is uninsured, moreover, does not take into account the millions of Americans now living with disease or disability who daily encounter problems with our health care system, including the 8 million Americans who have had cancer.

Age-Adjusted Cancer Death Rates,* Females by Site, US, 1930-1994



*Rates are per 100,000 and are age-adjusted to the 1970 US standard population. †Uterine cancer death rates are for cervix and endometrium combined.
Note: Due to changes in ICD coding, numerator information has changed over time. Rates for cancer of the uterus, ovary, lung, and colon and rectum are affected by these coding changes.
American Cancer Society, Surveillance Research, 1998. Data source: Vital Statistics of the United States, 1997.

Estimated New Cancer Cases and Deaths by Sex for All Sites, United States, 1998*

	Estimated New Cases			Estimated Deaths		
	Both Sexes	Male	Female	Both Sexes	Male	Female
All Sites	1,228,600	627,900	600,700	564,800	294,200	270,600
Oral cavity & pharynx	30,300	20,600	9,700	8,000	5,300	2,700
Tongue	6,700	4,300	2,400	1,700	1,100	600
Mouth	10,800	6,500	4,300	2,300	1,300	1,000
Pharynx	8,600	6,500	2,100	2,100	1,500	600
Other oral cavity	4,200	3,300	900	1,900	1,400	500
Digestive system	227,700	119,200	108,500	130,300	69,400	60,900
Esophagus	12,300	9,300	3,000	11,900	9,100	2,800
Stomach	22,600	14,300	8,300	13,700	8,100	5,600
Small intestine	4,500	2,400	2,100	1,200	600	600
Colon	95,600	44,400	51,200	47,700	23,100	24,600
Rectum	36,000	20,200	15,800	8,800	4,800	4,000
Anus, anal canal, & anorectum	3,300	1,400	1,900	500	200	300
Liver	13,900	9,300	4,600	13,000	7,900	5,100
Gallbladder & other biliary	6,700	2,600	4,100	3,500	1,200	2,300
Pancreas	29,000	14,100	14,900	28,900	14,000	14,900
Other digestive organs	3,800	1,200	2,600	1,100	400	700
Respiratory system	187,900	104,500	83,400	165,600	97,200	68,400
Larynx	11,100	9,000	2,100	4,300	3,400	900
Lung	171,500	91,400	80,100	160,100	93,100	67,000
Other respiratory organs	5,300	4,100	1,200	1,200	700	500
Bones & joints	2,400	1,300	1,100	1,400	800	600
Soft tissue (including heart)	7,000	3,700	3,300	4,300	2,000	2,300
Skin (excluding basal & squamous)	53,100	33,800	19,300	9,200	5,800	3,400
Melanoma	41,600	24,300	17,300	7,300	4,600	2,700
Other nonepithelial skin	11,500	9,500	2,000	1,900	1,200	700
Breast	180,300	1,600	178,700	43,900	400	43,500
Reproductive organs	274,000	193,600	80,400	66,900	39,800	27,100
Cervix (uterus)	13,700	—	13,700	4,900	—	4,900
Endometrium (uterus)	36,100	—	36,100	6,300	—	6,300
Ovary	25,400	—	25,400	14,500	—	14,500
Vulva	3,200	—	3,200	800	—	800
Vagina & female genital	2,000	—	2,000	600	—	600
Prostate	184,500	184,500	—	39,200	39,200	—
Testis	7,600	7,600	—	400	400	—
Penis & male genital	1,500	1,500	—	200	200	—
Urinary system	86,300	58,400	27,900	24,700	15,800	8,900
Urinary bladder	54,400	39,500	14,900	12,500	8,400	4,100
Kidney	29,900	17,600	12,300	11,600	7,100	4,500
Ureter & other urinary organs	2,000	1,300	700	600	300	300
Eye & orbit	2,100	1,100	1,000	300	200	100
Brain	17,400	9,800	7,600	13,300	7,300	6,000
Endocrine system	18,800	5,500	13,300	2,000	800	1,200
Thyroid	17,200	4,700	12,500	1,200	400	800
Other endocrine	1,600	800	800	800	400	400
Lymphoma	62,500	34,800	27,700	26,300	13,700	12,600
Hodgkin's disease	7,100	3,700	3,400	1,400	700	700
Non-Hodgkin's lymphoma	55,400	31,100	24,300	24,900	13,000	11,900
Multiple myeloma	13,800	7,200	6,600	11,300	5,800	5,500
Leukemia	28,700	16,100	12,600	21,600	12,000	9,600
Acute lymphocytic leukemia	3,100	1,700	1,400	1,300	700	600
Chronic lymphocytic leukemia	7,300	4,100	3,200	4,800	2,800	2,000
Acute myeloid leukemia	9,400	4,700	4,700	6,600	3,600	3,000
Chronic myeloid leukemia	4,300	2,500	1,800	2,400	1,400	1,000
Other leukemia	4,600	3,100	1,500	6,500	3,500	3,000
Other & unspecified primary sites	36,300	16,700	19,600	35,700	17,900	17,800

*Excludes basal and squamous cell skin cancers and in situ carcinomas except urinary bladder. Carcinoma in situ of the breast accounts for about 36,900 new cases annually, and melanoma carcinoma in situ accounts for about 21,100 new cases annually. Estimates of new cases are based on incidence rates from the NCI SEER program 1979-1994.

American Cancer Society, Surveillance Research, 1998.

Estimated New Cancer Cases, by State, 1998*

State	All Sites	Female Breast	Cervix (uterus)	Colon & Rectum	Endometrium (uterus)	Lung	Melanoma	Non-Hodgkin's Lymphoma	Ovary	Prostate	Urinary Bladder
Alabama	20,700	2,600	200	1,600	500	3,000	800	900	400	3,000	700
Alaska	1,300	200	‡	200	‡	200	‡	‡	‡	200	‡
Arizona	19,500	2,900	200	2,000	600	2,800	800	900	500	3,200	900
Arkansas	14,000	1,800	200	1,500	400	2,300	300	500	300	2,400	500
California	113,300	17,600	1,500	11,600	3,400	14,700	4,500	4,900	2,600	17,200	5,200
Colorado	13,200	2,000	200	1,400	500	1,600	700	700	200	2,200	600
Connecticut	15,400	2,000	100	1,700	300	2,000	600	700	300	2,200	700
Delaware	3,800	500	100	400	100	600	100	200	100	500	200
Dist. of Columbia	3,100	500	‡	300	200	400	‡	100	100	600	100
Florida	88,100	11,800	1,000	9,400	2,600	12,900	2,900	3,900	1,900	14,100	4,300
Georgia	28,300	4,000	300	2,600	900	4,200	1,000	1,000	600	4,500	900
Hawaii	4,300	500	‡	500	100	500	100	300	100	600	200
Idaho	4,400	700	‡	400	‡	600	200	200	100	900	200
Illinois	58,100	8,900	600	6,400	1,600	7,800	1,900	2,600	1,200	8,300	2,500
Indiana	28,100	4,000	300	3,000	700	4,200	900	1,200	600	3,600	1,300
Iowa	14,800	2,400	100	1,900	500	2,000	400	800	300	2,300	700
Kansas	11,900	1,700	100	1,300	300	1,600	600	600	300	1,900	500
Kentucky	20,600	2,900	300	2,200	500	3,600	800	800	400	2,500	700
Louisiana	20,500	3,100	200	2,100	400	3,100	600	800	300	3,100	600
Maine	7,300	1,000	100	800	200	1,000	200	300	200	900	400
Maryland	22,900	3,500	300	2,700	600	3,200	700	900	300	3,500	1,100
Massachusetts	31,500	4,500	200	3,700	700	4,100	1,300	1,500	600	4,300	1,700
Michigan	44,900	6,300	500	5,000	1,500	6,400	1,200	2,100	800	6,600	2,300
Minnesota	19,600	2,800	100	1,900	500	2,400	500	1,200	400	3,100	800
Mississippi	13,200	1,700	200	1,200	200	1,800	200	500	200	2,300	300
Missouri	28,100	3,400	400	3,000	900	4,300	900	1,200	500	3,900	1,300
Montana	4,100	600	‡	500	100	500	100	200	100	700	200
Nebraska	7,500	1,100	‡	900	100	1,000	200	300	200	1,100	200
Nevada	7,600	1,000	100	800	100	1,200	300	300	100	1,100	300
New Hampshire	5,600	900	100	600	100	700	200	300	100	600	300
New Jersey	40,500	6,200	400	4,800	1,300	4,900	1,400	1,800	1,000	5,700	2,200
New Mexico	6,200	800	100	600	200	700	400	300	100	1,100	200
New York	83,600	13,400	1,100	9,700	3,400	10,900	2,300	4,100	1,800	11,800	4,200
North Carolina	35,100	4,700	300	3,700	1,000	5,400	1,100	1,400	600	5,600	1,300
North Dakota	3,200	500	‡	400	100	300	100	200	100	600	200
Ohio	56,500	8,600	600	6,100	2,000	8,200	1,600	2,700	1,000	8,200	2,400
Oklahoma	15,600	2,300	200	1,700	200	2,500	500	800	300	2,200	600
Oregon	15,900	2,100	100	1,400	500	2,300	700	800	400	2,300	600
Pennsylvania	68,800	10,800	700	7,900	2,200	9,100	2,200	3,200	1,500	10,400	3,000
Rhode Island	5,200	800	‡	600	200	800	100	300	100	600	300
South Carolina	17,600	2,500	200	2,000	500	2,600	500	600	400	3,000	900
South Dakota	3,500	500	‡	300	100	400	100	100	100	600	200
Tennessee	25,800	3,900	400	2,800	700	4,200	1,200	1,100	500	3,300	1,000
Texas	77,500	11,300	1,200	8,500	2,200	11,600	2,800	3,800	1,500	11,900	2,900
Utah	5,200	800	100	600	200	400	300	400	200	1,000	200
Vermont	2,600	300	100	300	100	400	200	100	100	300	100
Virginia	28,900	4,300	300	3,100	1,000	4,000	1,200	1,200	500	4,400	1,300
Washington	24,100	3,200	200	2,300	600	3,400	700	1,100	600	3,500	1,100
West Virginia	10,700	1,200	100	1,100	300	1,700	400	400	200	1,500	600
Wisconsin	24,500	3,600	300	2,500	800	2,800	700	1,300	600	4,400	1,200
Wyoming	1,800	300	‡	200	100	300	100	100	‡	300	‡

*Excludes basal and squamous cell skin cancers and in situ carcinomas except urinary bladder.

‡Estimate is 50 or fewer cases. State case estimates between 51 and 99 were rounded to 100.

These estimates are offered as a rough guide and should be interpreted with caution. They are calculated according to the distribution of estimated 1998 cancer deaths by state.

American Cancer Society, Surveillance Research, 1998.

Estimated Cancer Mortality, by State, 1998*

State	Reported Mortality Rate per 100,000†	All Sites	Female Breast	Colon & Rectum	Esophagus	Leukemia	Lung	Non-Hodgkin's Lymphoma	Ovary	Pancreas	Prostate	Stomach
Alabama	179	9,500	600	700	200	400	2,800	400	200	500	600	200
Alaska	171	600	100	100	‡	‡	200	‡	‡	‡	‡	‡
Arizona	160	9,000	700	900	200	400	2,600	400	300	500	700	200
Arkansas	180	6,400	400	600	100	200	2,200	200	200	300	500	100
California	162	52,100	4,300	5,000	1,100	2,100	13,700	2,200	1,500	2,800	3,700	1,600
Colorado	147	6,100	500	600	100	300	1,500	300	100	300	500	100
Connecticut	165	7,100	500	700	200	300	1,900	300	200	400	500	200
Delaware	196	1,800	100	200	‡	100	600	100	‡	100	100	‡
Dist. of Columbia	218	1,400	100	100	‡	‡	400	‡	‡	100	100	100
Florida	167	40,500	2,900	4,000	800	1,400	12,000	1,800	1,100	2,200	3,000	900
Georgia	176	13,000	1,000	1,100	300	500	3,900	400	300	700	1,000	300
Hawaii	136	2,000	100	200	‡	100	500	100	100	100	100	100
Idaho	148	2,000	200	200	‡	100	500	100	100	100	200	‡
Illinois	180	26,700	2,200	2,800	600	1,100	7,300	1,200	700	1,300	1,800	600
Indiana	177	12,900	1,000	1,300	300	500	3,900	500	400	700	800	200
Iowa	160	6,800	600	800	100	300	1,900	400	200	300	500	100
Kansas	159	5,500	400	600	100	200	1,500	300	200	300	400	100
Kentucky	192	9,500	700	900	200	300	3,300	300	200	500	500	200
Louisiana	194	9,400	800	900	100	400	2,900	400	200	500	700	300
Maine	186	3,300	200	300	100	100	1,000	200	100	200	200	100
Maryland	189	10,500	800	1,100	200	300	3,000	400	200	500	700	200
Massachusetts	180	14,500	1,100	1,600	300	500	3,800	700	300	700	900	300
Michigan	177	20,700	1,500	2,100	500	800	5,900	900	500	1,100	1,400	500
Minnesota	156	9,000	700	800	100	400	2,200	500	200	500	700	200
Mississippi	181	6,100	400	500	100	200	1,700	200	100	300	500	200
Missouri	177	12,900	800	1,300	300	500	4,000	500	300	600	800	300
Montana	161	1,900	100	200	‡	100	500	100	‡	100	200	‡
Nebraska	156	3,400	300	400	100	100	900	200	100	200	200	100
Nevada	185	3,500	300	400	100	100	1,100	100	100	200	200	100
New Hampshire	181	2,600	200	200	100	100	700	100	100	100	100	‡
New Jersey	183	18,600	1,500	2,000	400	800	4,600	800	600	1,000	1,200	500
New Mexico	146	2,900	200	200	100	100	700	100	100	200	200	100
New York	172	38,400	3,300	4,200	900	1,400	10,100	1,800	1,000	2,200	2,500	1,300
North Carolina	175	16,100	1,100	1,600	400	600	5,000	600	300	800	1,200	400
North Dakota	156	1,500	100	200	‡	100	300	100	‡	100	100	‡
Ohio	181	26,000	2,100	2,600	600	900	7,700	1,200	600	1,200	1,700	500
Oklahoma	170	7,200	500	700	100	300	2,300	400	200	300	500	100
Oregon	167	7,300	500	600	200	300	2,100	400	200	400	500	100
Pennsylvania	179	31,600	2,600	3,400	700	1,200	8,500	1,400	800	1,500	2,200	800
Rhode Island	178	2,400	200	300	‡	100	700	100	100	100	100	100
South Carolina	179	8,100	600	900	200	300	2,400	300	200	400	600	100
South Dakota	154	1,600	100	100	‡	100	400	100	‡	100	100	‡
Tennessee	180	11,900	900	1,200	200	500	3,900	500	300	600	700	200
Texas	171	35,600	2,800	3,600	700	1,400	10,800	1,700	900	1,900	2,500	1,000
Utah	125	2,400	200	200	‡	100	400	200	100	100	200	‡
Vermont	174	1,200	100	100	‡	‡	400	100	‡	‡	100	‡
Virginia	179	13,300	1,100	1,300	300	500	3,800	600	300	700	900	200
Washington	165	11,100	800	1,000	300	500	3,200	500	300	500	700	200
West Virginia	184	4,900	300	500	100	200	1,600	200	100	200	300	100
Wisconsin	165	11,300	900	1,100	300	500	2,700	600	400	600	900	300
Wyoming	151	800	100	100	‡	‡	300	‡	‡	‡	100	‡

*Excludes basal and squamous cell skin cancers and in situ carcinomas except urinary bladder. †Average annual mortality rate for 1990-1994, age-adjusted to the 1970 US standard population. ‡Estimate is 50 or fewer deaths. State death estimates between 51 and 99 were rounded to 100.

American Cancer Society, Surveillance Research, 1998.

20-Year Trends in Cancer Death Rates* per 100,000 Population, 1972–1974 to 1992–1994

Sites	Sex	Rates in 1972–1974	Rates in 1992–1994	Percent Changes	Number of Deaths 1974	Number of Deaths 1994
All Sites	Male	206.2	217.3	5%	195,873	280,465
	Female	132.1	141.8	7%	163,088	253,845
Brain	Male	4.7	5.1	9%	4,740	6,702
	Female	3.2	3.5	9%	3,659	5,611
Breast	Male	0.3	0.3	0%	292	364
	Female	26.9	25.9	-4%	32,132	43,644
Cervix (uterus)	Female	5.3	2.9	-45%	5,963	4,602
Colon & rectum	Male	25.4	22.1	-13%	23,853	28,471
	Female	19.8	14.9	-25%	25,440	28,936
Endometrium (uterus)	Female	4.6	3.4	-26%	5,603	6,163
Esophagus	Male	5.1	6.3	24%	4,917	8,191
	Female	1.4	1.5	7%	1,735	2,626
Hodgkin's disease	Male	1.7	0.6	-65%	1,588	773
	Female	1.0	0.4	-60%	1,087	667
Kidney	Male	4.4	5.1	16%	4,204	6,522
	Female	1.9	2.3	21%	2,449	4,228
Larynx	Male	2.9	2.5	-14%	2,826	3,127
	Female	0.4	0.5	25%	436	820
Leukemia	Male	8.8	8.4	-5%	8,231	10,948
	Female	5.2	4.9	-6%	6,344	8,885
Liver	Male	3.3	4.8	45%	3,113	6,388
	Female	1.8	2.1	17%	2,166	4,039
Lung	Male	62.9	72.3	15%	61,507	91,825
	Female	13.5	33.4	147%	17,213	57,535
Melanoma	Male	2.1	3.1	48%	2,201	4,117
	Female	1.3	1.5	15%	1,534	2,563
Multiple myeloma	Male	2.8	3.8	36%	2,690	5,137
	Female	1.9	2.6	37%	2,430	4,843
Non-Hodgkin's lymphoma	Male	5.8	8.2	41%	5,686	11,280
	Female	4.0	5.4	35%	4,933	10,528
Oral cavity	Male	5.9	4.3	-27%	5,686	5,227
	Female	1.9	1.5	-21%	2,282	2,688
Ovary	Female	8.5	7.7	-9%	10,203	13,500
Pancreas	Male	11.0	10.0	-9%	10,208	12,920
	Female	6.7	7.3	9%	8,688	13,914
Prostate	Male	21.6	26.6	23%	19,184	34,902
Stomach	Male	10.1	6.3	-38%	9,159	8,039
	Female	4.8	2.9	-40%	6,012	5,531
Testis	Male	0.7	0.2	-71%	755	349
Thyroid	Male	0.4	0.3	-25%	316	402
	Female	0.5	0.4	-20%	663	660
Urinary bladder	Male	7.3	5.7	-22%	6,651	7,457
	Female	2.2	1.7	-23%	2,926	3,713

*Age-adjusted to the 1970 US standard population.

Note: Even though death rates declined or remained stable, the number of deaths increased because the population over 65 has become larger and older. From 1974 to 1994, the US population increased 22%, while the US population aged 65 and older increased 50%.

American Cancer Society, Surveillance Research, 1998.

Data source: Vital Statistics of the United States, 1997.

SELECTED CANCERS

BREAST CANCER

New Cases: An estimated 178,700 new invasive cases among women in the United States during 1998. About 1,600 new cases of breast cancer will be diagnosed in men in 1998. After increasing about 4% per year in the 1980s, breast cancer incidence rates in women have leveled off in recent years to about 110 cases per 100,000.

Deaths: An estimated 43,900 deaths (43,500 women, 400 men) in 1998; in women, the second major cause of cancer death. According to the most recent data, mortality rates continue to decline with the largest decreases in younger women—both white and African American. These decreases are likely due to earlier detection and improved treatment.

Signs and Symptoms: The earliest sign of breast cancer is usually an abnormality that shows up on a mammogram before it can be felt by the woman or her health care provider. When breast cancer has grown to the point where physical signs and symptoms exist, these may include a breast lump, thickening, swelling, distortion, or tenderness; skin irritation or dimpling; and nipple pain, scaliness, or retraction. Breast pain is very commonly due to benign conditions, and is uncommonly the first symptom of breast cancer.

Risk Factors: The risk of breast cancer increases with age. The risk is higher in women who have a personal or family history of breast cancer; biopsy-confirmed atypical hyperplasia; early menarche; late menopause; recent use of oral contraceptives or postmenopausal estrogens; never having children or having the first live birth at a late age; and higher education and socioeconomic status. International variability in breast cancer incidence rates appear to correlate with variations in diet, especially fat intake, although a causal role for dietary factors has not been firmly established. Additional factors that may be associated with increased breast cancer risk and that are currently under study include pesticide and other chemical exposures, alcohol consumption, weight gain, induced abortion, and physical inactivity. Exciting new research about BRCA1 and BRCA2 susceptibility genes for breast cancer is also in progress, although, general screening in the population for these genes is not yet recommended. Research is ongoing to learn more about the complex characteristics of these genes and to evaluate their contribution to the incidence of breast cancer.

A majority of women will have one or more risk factors for breast cancer. However, most risks are at such a low level that they only partly explain the high frequency of the disease in the population. Although women may not be able to alter their personal risk factors, maintaining an ideal body weight and reducing alcohol consumption may offer some reduction in breast cancer risk. Early detection is the best opportunity to reduce mortality.

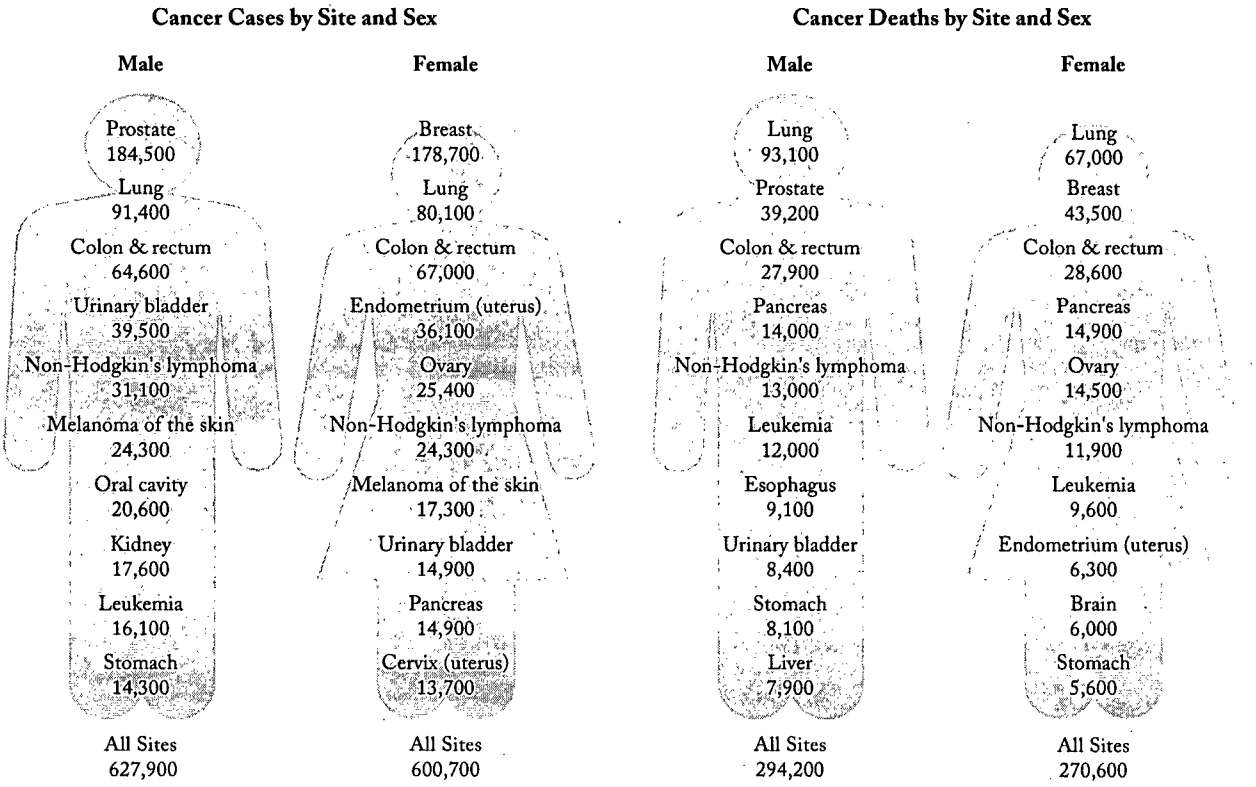
Early Detection: The value of mammography is that it can identify breast abnormalities that may be cancer at an early stage before physical symptoms develop. Numerous studies have shown that early detection increases survival and treatment options. The Society's guidelines for early breast cancer detection (see page 31) stress mammography and physical examinations.

Most breast lumps are not cancer, but only a physician can make a diagnosis. When a woman has a suspicious lump or when a suspicious area is identified on a mammogram, diagnostic mammography can help determine whether additional tests are needed and if there are other lesions that are too small to be felt in the same or the opposite breast. All suspicious lumps should be biopsied for a definitive diagnosis.

Treatment: Taking into account the medical situation and the patient's preferences, treatment may involve lumpectomy (local removal of the tumor) and removal of the lymph nodes under the arm; mastectomy (surgical removal of the breast) and removal of the lymph nodes under the arm; radiation therapy; chemotherapy; or hormone therapy. Often, two or more methods are used in combination. Numerous studies have shown that, for early-stage disease, long-term survival rates after lumpectomy plus radiotherapy are similar to survival rates after modified radical mastectomy. Patients should discuss possible options for the best management of their breast cancer with their physicians. Significant advances in reconstruction techniques provide several options for breast reconstruction after mastectomy. In recent years, this has been performed most often at the same time as the mastectomy. High-dose chemotherapy with bone marrow transplant or stem cell rescue is a new treatment under study for special cases of breast cancer.

Survival: The 5-year relative survival rate for localized breast cancer has increased from 72% in the 1940s to 97% today. If the cancer has spread regionally, however, the rate is 76%, and for women with distant metastases the rate is 21%. Survival after a diagnosis of breast cancer continues to decline beyond five years. Sixty-seven percent of women diagnosed with breast cancer survive 10 years, and 56% survive 15 years.

Leading Sites of New Cancer Cases and Deaths—1998 Estimates*



*Excluding basal and squamous cell skin cancer and in situ carcinomas except urinary bladder.
American Cancer Society, Surveillance Research, 1998.

For more information about breast cancer, please inquire about the American Cancer Society publication *Breast Cancer Facts & Figures.*

CERVIX (UTERUS) CANCER

New Cases: An estimated 13,700 cases of invasive cervical cancer will be diagnosed in 1998. Rates have decreased steadily over the past several decades, declining from 14.2 per 100,000 in 1973 to 7.8 per 100,000 in 1994. As Pap screening has become more prevalent, carcinoma in situ of the cervix is now more frequent than invasive cancer, particularly in women under age 50.

Deaths: An estimated 4,900 cervical cancer deaths in 1998. Rates declined 45% between 1972–1974 and 1992–1994. Rates for African Americans declined more rapidly than those for whites; however, in 1994 the mortality rate for African-American women continues to be more than two times greater than the rate among white women.

Signs and Symptoms: Abnormal vaginal bleeding or spotting; abnormal vaginal discharge. Pain and systemic symptoms are late manifestations of the disease.

Risk Factors: Cervical cancer risk is closely linked to sexual behavior and to sexually transmitted infections with certain types of human papillomavirus. Women who have first intercourse at an early age, multiple sexual partners, or partners who have had multiple sexual partners are at increased risk of developing the disease. Other risk factors include cigarette smoking and low socioeconomic status.

Early Detection: The Pap test is a simple procedure that can be performed by a health care professional as part of a pelvic exam. A small sample of cells is swabbed from the cervix, transferred to a slide, and examined under a microscope. This test should be performed annually with a pelvic exam in women who are, or have been, sexually active or who have reached age 18. After three or more consecutive annual exams with normal findings, the Pap

How to Estimate Cancer Statistics Locally, 1998

To obtain the estimated number of...	Multiply community population by: All Sites	Female Breast*	Colon & Rectum	Lung	Prostate*
New cancer cases	0.0046	0.0013	0.0005	0.0006	0.0014
Cancer deaths	0.0021	0.0031	0.0002	0.0006	0.0003
People who will eventually develop cancer	0.4232	0.1252	0.0580	0.0699	0.1885
People who will eventually die of cancer	0.2224	0.0346	0.0255	0.0574	0.0364

*For female breast cancer multiply by female population and for prostate cancer multiply by male population.

Note: These calculations provide only a rough approximation of the number of people in a specific community who may develop or die of cancer. These estimates should be used with caution because they do not reflect the age or racial characteristics of the population, access to detection and treatment, or exposure to risk factors. Many states have cancer registries which count the number of cancers that occur in localities throughout the state. The American Cancer Society recommends using data from these registries, when it is available, to more accurately estimate local cancer statistics.

American Cancer Society, Surveillance Research, 1998.

Data source: NCI Surveillance, Epidemiology, and End Results Program, 1997.

test may be performed less frequently at the discretion of the physician.

Treatment: Invasive cervical cancers generally are treated by surgery or radiation, or both. For in situ cancers, changes in the cervix may be treated by cryotherapy (the destruction of cells by extreme cold), by electrocoagulation (the destruction of tissue through intense heat by electric current), laser ablation, or by local surgery.

Survival: Eighty-nine percent of cervical cancer patients survive one year after diagnosis, and 69% survive five years. When detected at an early stage, invasive cervical cancer is one of the most successfully treatable cancers with a 5-year relative survival rate of 91% for localized cancers. Whites are more likely than African Americans to have their cancers diagnosed at this early stage. Fifty-four percent of cervical cancers among white women and 40% of cancers among African-American women are diagnosed at a localized stage.

Colon and Rectum Cancer

New Cases: An estimated 131,600 cases in 1998, including 95,600 of colon cancer and 36,000 of rectal cancer. Colorectal cancers account for about 11% of new cancer diagnoses. Incidence rates have declined in recent years from a high of 53 per 100,000 in 1985 to 44 per 100,000 in 1994. This decline has been experienced primarily by whites, although incidence rates for African Americans may be beginning to decline. Research has suggested that the recent decline may have been due to increased screening and polyp removal, preventing progression of polyps to invasive cancers.

Deaths: An estimated 56,500 deaths (47,700 from colon cancer, 8,800 from rectal cancer) in 1998, accounting for about 10% of cancer deaths. Mortality rates for colorectal cancer have fallen 25% for women and 13% for men during the past 20 years, reflecting decreasing incidence rates and increasing survival rates.

Signs and Symptoms: Rectal bleeding, blood in the stool, a change in bowel habits.

Risk Factors: A personal or family history of colorectal cancer or polyps, and inflammatory bowel disease have been associated with increased colorectal cancer risk. Other possible risk factors include physical inactivity, high-fat and/or low-fiber diet, as well as inadequate intake of fruits and vegetables. Recent studies have suggested that estrogen replacement therapy and non-steroidal antiinflammatory drugs such as aspirin may reduce colorectal cancer risk.

Early Detection: . Beginning at age 50, men and women should have one of the following: a yearly fecal occult blood test plus flexible sigmoidoscopy every 5 years, *or* colonoscopy every 10 years, *or* double contrast barium enema every 5 to 10 years. A digital rectal examination should be done at the same time as sigmoidoscopy, colonoscopy, or double contrast barium enema. These tests offer the best opportunity to detect colorectal cancer at an early stage when successful treatment is likely, and to prevent some cancers by detection and removal of polyps. People should begin colorectal cancer screening earlier and/or undergo screening more often if they have a personal history of colorectal cancer or adenomatous polyps, a strong family history of colorectal cancer or polyps, a personal history of chronic inflammatory bowel disease, or if they are a member of a family with hereditary colorectal cancer syndromes.

Treatment: Surgery is the most common form of therapy for colorectal cancer, and for cancers that have not spread, it is frequently curative. Chemotherapy, or

Percentage of Population (Probability) Developing Invasive Cancers at Certain Ages by Sex, US, 1992–1994

		Birth to 39	40 to 59	60 to 79	Birth to Death
All sites*	Male	1.68 (1 in 60)	8.23 (1 in 12)	36.69 (1 in 3)	46.64 (1 in 2)
	Female	1.94 (1 in 52)	9.05 (1 in 11)	22.21 (1 in 5)	38.00 (1 in 3)
Breast	Female	0.44 (1 in 227)	3.94 (1 in 25)	6.89 (1 in 15)	12.52 (1 in 8)
Colon &	Male	0.06 (1 in 1,667)	0.88 (1 in 114)	4.19 (1 in 24)	5.88 (1 in 17)
Rectum	Female	0.05 (1 in 2,000)	0.68 (1 in 147)	3.18 (1 in 31)	5.72 (1 in 17)
Lung &	Male	0.04 (1 in 2,500)	1.39 (1 in 72)	6.69 (1 in 15)	8.43 (1 in 12)
Bronchus	Female	0.03 (1 in 3,333)	1.00 (1 in 100)	3.88 (1 in 26)	5.55 (1 in 18)
Prostate	Male	Less than 1 in 10,000	1.74 (1 in 57)	16.40 (1 in 6)	18.85 (1 in 5)

*Excludes basal and squamous cell skin cancers and in situ carcinomas except urinary bladder.
Data source: NCI Surveillance, Epidemiology, and End Results Program, 1997.

chemotherapy plus radiation is given before or after surgery to most patients whose cancer has deeply perforated the bowel wall or has spread to the lymph nodes. A permanent colostomy (creation of an abdominal opening for elimination of body wastes) is seldom needed for colon cancer and is infrequently required for rectal cancer.

Survival: The 1- and 5-year relative survival rates for patients with colon and rectum cancer are 81% and 62%, respectively. When colorectal cancers are detected in an early, localized stage, the 5-year relative survival rate is 92%; however, only 37% of colorectal cancers are discovered at that stage. After the cancer has spread regionally to involve adjacent organs or lymph nodes, the rate drops to 64%. The survival rate for persons with distant metastases is 7%. Survival continues to decline beyond five years, and 51% of persons diagnosed with colorectal cancers survive 10 years.

ENDOMETRIUM (UTERUS) CANCER

New Cases: An estimated 36,100 cases of cancer of the uterine corpus (body of the uterus), usually of the endometrium, will be diagnosed in 1998. Incidence rates have been relatively constant since the mid 1980s at about 21 per 100,000.

Deaths: An estimated 6,300 deaths in 1998. Mortality rates have been relatively constant since 1989 at about 3 per 100,000.

Signs and Symptoms: Abnormal uterine bleeding or spotting. Pain and systemic symptoms are late manifestations of the disease.

Risk Factors: Estrogen is the major risk factor for the most common type of endometrial cancer. Estrogen-related exposures including estrogen replacement therapy, tamoxifen, early menarche, late menopause, never having children, and a history of failure to ovulate have all been shown to increase risk. Progesterone added to estrogen replacement therapy (called hormone replacement therapy) is believed to offset the increased risk related to using only estrogen. In the other type of endometrial cancer, a relationship to estrogen has not been proven. These tumors are more aggressive with a poorer prognosis. Other risk factors for endometrial cancer include infertility, diabetes, gallbladder disease, hypertension, and obesity. Pregnancy and the use of oral contraceptives appear to provide protection against endometrial cancer.

Early Detection: The Pap test, highly effective in detecting early cancer of the cervix, is rarely effective in detecting endometrial cancer. Women 40 and over should have an annual pelvic exam by a health professional. Endometrial biopsy is recommended at menopause and periodically thereafter for women at very high risk of developing endometrial cancer although the frequency of biopsy is at the discretion of the physician.

Treatment: Uterine cancers are usually treated with surgery, radiation, hormones, and/or chemotherapy depending on the stage of disease.

Survival: The 1-year relative survival rate for endometrial cancer is 92%. The 5-year relative survival rate is 96% if the cancer is discovered at an early stage and 66% if diagnosed at a regional stage. Relative survival rates for whites exceed those for blacks by at least 15% at every stage.

LEUKEMIA

New Cases: An estimated 28,700 new cases in 1998, approximately evenly divided between acute leukemia and chronic leukemia. Although often thought of as primarily a childhood disease, leukemia is expected to strike many more adults (26,500) than children (2,200) this year. Acute lymphocytic leukemia accounts for

approximately 1,300 of the cases of leukemia among children. In adults, the most common types are acute myelocytic (approximately 9,400 cases) and chronic lymphocytic (approximately 7,300 cases).

Deaths: An estimated 21,600 deaths in 1998.

Signs and Symptoms: Fatigue, paleness, weight loss, repeated infections, bruising easily, and nosebleeds or other hemorrhages. In children, these signs can appear suddenly. Chronic leukemia can progress slowly and with few symptoms.

Risk Factors: Leukemia strikes both sexes and all ages. Causes of most leukemias are unknown. Persons with Down syndrome and certain other genetic abnormalities have higher incidence rates of leukemia. It has also been linked to excessive exposure to ionizing radiation and to certain chemicals such as benzene, a commercially used toxic liquid that is also present in lead-free gasoline. Certain forms of leukemia and lymphoma are caused by a retrovirus, human T-cell leukemia/lymphoma virus-I (HTLV-I).

Early Detection: Because symptoms often resemble those of other, less serious conditions, leukemia can be difficult to diagnose early. When a physician does suspect leukemia, diagnosis can be made using blood tests and bone marrow biopsy.

Treatment: Chemotherapy is the most effective method of treating leukemia. Various anticancer drugs are used, either in combinations or as single agents. Transfusions of blood components and antibiotics are used as supportive treatments. Under appropriate conditions, bone marrow transplantation may be useful in treating certain leukemias.

Survival: The 1-year relative survival rate for patients with leukemia is 63%. Survival drops to 42% at five years after diagnosis, primarily due to the poor survival of patients with some types of leukemia, such as acute myelocytic. There has been a dramatic improvement in survival for patients with acute lymphocytic leukemia—from a 5-year relative survival rate of 38% in the mid-1970s to 57% in the late 1980s. Survival rates for children have increased from 53% to 80% over the same time period.

LUNG CANCER

New Cases: An estimated 171,500 new cases in 1998, accounting for 14% of cancer diagnoses. The incidence rate is declining in men, from a high of 87 per 100,000 in 1984 to 74 in 1994. Recently, the rate of increase among women has begun to slow. In 1994, the incidence rate in women was 42 per 100,000.

Deaths: An estimated 160,100 deaths in 1998, accounting for 28% of all cancer deaths. Since 1987, more women have died each year of lung cancer than breast cancer, which, for over 40 years, was the major cause of cancer death in women.

Signs and Symptoms: Persistent cough, sputum streaked with blood, chest pain, and recurring pneumonia or bronchitis.

Risk Factors: Cigarette smoking is by far the most important risk factor in the development of lung cancer. Other risk factors include exposure to certain industrial substances, such as arsenic; some organic chemicals and radon and asbestos, particularly for persons who smoke; radiation exposure from occupational, medical, and environmental sources; air pollution; tuberculosis; and environmental tobacco smoke in nonsmokers.

Early Detection: Because symptoms often do not appear until the disease is advanced, early detection is difficult. In those who stop smoking when precancerous changes are found, damaged lung tissue often returns to normal. Chest x-ray, analysis of cells contained in sputum, and fiberoptic examination of the bronchial passages assist diagnosis.

Treatment: Treatment options are determined by the type and stage of the cancer and include surgery, radiation therapy, and chemotherapy. For many localized cancers, surgery is usually the treatment of choice. Because the disease has usually spread by the time it is discovered, radiation therapy and chemotherapy are often needed in combination with surgery. Chemotherapy alone or combined with radiation has replaced surgery as the treatment of choice for small cell lung cancer; on this regimen, a large percentage of patients experience remission, which in some cases is long-lasting.

Survival: The 1-year relative survival rates for lung cancer have increased from 32% in 1973 to 40% in 1994, largely due to improvements in surgical techniques. The 5-year relative survival rate for all stages combined is only 14%. The survival rate is 49% for cases detected when the disease is still localized, but only 15% of lung cancers are discovered that early.

LYMPHOMA

New Cases: An estimated 62,500 new cases in 1998, including 7,100 cases of Hodgkin's disease and 55,400 cases of non-Hodgkin's lymphoma. Since the early 1970s, incidence rates for non-Hodgkin's lymphoma have nearly doubled. Incidence rates for Hodgkin's disease have declined over the same time period, especially among the elderly.

Deaths: An estimated 26,300 deaths in 1998 (non-Hodgkin's lymphoma, 24,900; Hodgkin's disease, 1,400).

Signs and Symptoms: Enlarged lymph nodes, itching, fever, night sweats, anemia, and weight loss. Fever can come and go in periods of several days or weeks.

Risk Factors: Risk factors are largely unknown but in part involve reduced immune function and exposure to certain infectious agents. Persons with organ transplants are at higher risk due to altered immune function. Human immunodeficiency virus (HIV) and human T-cell leukemia/lymphoma virus-I (HTLV-I) are associated with increased risk of non-Hodgkin's lymphoma. Burkitt's lymphoma in Africa is partly caused by the Epstein-Barr virus. Other possible risk factors include occupational exposures to herbicides and perhaps other chemicals.

Treatment: Hodgkin's disease: chemotherapy and radiotherapy are useful for most patients. Non-Hodgkin's lymphoma: early stage, localized lymph node disease can be treated with radiotherapy. Patients with later-stage disease are treated with chemotherapy or with chemotherapy plus radiation depending on the specific type of non-Hodgkin's lymphoma. New programs using highly specific monoclonal antibodies directed at lymphoma cells, and high-dose chemotherapy with bone marrow transplantation, are being investigated in selected patients who relapse after standard treatment.

Survival: Survival rates vary widely by cell type and stage of disease. The 1-year relative survival rates for Hodgkin's and non-Hodgkin's lymphoma are 92% and 71%, respectively; the 5-year rates are 81% and 51%. Ten years after diagnosis, the relative survival rates for Hodgkin's and non-Hodgkin's disease decline to 72% and 43%; and the 15-year survival rates are 62% and 35%, respectively.

Oral Cavity and Pharynx Cancer

New Cases: An estimated 30,300 new cases in 1998. Incidence rates are more than twice as high in men as in women and are greatest in men who are over age 40.

Deaths: An estimated 8,000 deaths in 1998. Mortality rates have been decreasing since the early 1980s.

Signs and Symptoms: A sore that bleeds easily and does not heal; a lump or thickening; a red or white patch that persists. Difficulty in chewing, swallowing, or moving tongue or jaws are often late symptoms.

Risk Factors: Cigarette, cigar, or pipe smoking; use of smokeless tobacco; excessive consumption of alcohol.

Early Detection: Cancer can affect any part of the oral cavity, including the lip, tongue, mouth, and throat. Dentists and primary care physicians have the opportunity, during regular checkups, to see abnormal tissue changes and to detect cancer at an early, curable stage.

Treatment: Principal methods are radiation therapy and surgery. In advanced disease, chemotherapy may be useful as an adjunct to surgery.

Survival: Eighty-one percent of oral cavity and pharynx cancer patients survive one year after diagnosis. For all stages combined, the 5-year relative survival rate is 53%; and the 10-year rate is 43%.

Ovary Cancer

New Cases: An estimated 25,400 new cases in the United States in 1998. It accounts for 4% of all cancers among women and ranks second among gynecologic cancers.

Deaths: An estimated 14,500 deaths in 1998. Ovarian cancer causes more deaths than any other cancer of the female reproductive system.

Signs and Symptoms: Ovarian cancer is often "silent," showing no obvious signs or symptoms until late in its development. The most common sign is enlargement of the abdomen, which is caused by accumulation of fluid. Rarely will there be abnormal vaginal bleeding. In women over 40, vague digestive disturbances (stomach discomfort, gas, distention) that persist and cannot be explained by any other cause may indicate the need for a thorough evaluation for ovarian cancer, including a carefully performed pelvic examination.

Risk Factors: Risk for ovarian cancer increases with age and peaks in the eighth decade. Women who have never had children are more likely to develop ovarian cancer than those who have. Pregnancy and the use of oral contraceptives appear to reduce the risk of developing ovarian cancer. Women who have had breast cancer or have a family history of breast or ovarian cancer are at increased risk. Mutations in BRCA1 or BRCA2 have been observed in these families. Another genetic syndrome, hereditary non-polyposis colon cancer, is characterized by colorectal cancer, endometrial cancer, and ovarian cancer. With the exception of Japan, industrialized countries have the highest incidence rates.

Early Detection: Periodic, thorough pelvic exams are important. The Pap test, useful in detecting cervical cancer, rarely uncovers ovarian cancer. Transvaginal ultrasound and a tumor marker, CA125, may assist diagnosis but are not recommended for routine screening.

Five-Year Relative Survival Rates by Stage at Diagnosis*

Site	All Stages %	Local %	Regional %	Distant %	Site	All Stages %	Local %	Regional %	Distant %
Breast (female)	84	97	76	21	Oral cavity	53	81	42	18
Cervix (uterus)	69	91	49	9	Ovary	46	93	55	25
Colon	62	93	67	8	Pancreas	4	15	5	2
Endometrium (uterus)	84	96	66	27	Prostate	89	100	94	31
Esophagus	11	23	10	2	Rectum	60	88	55	5
Kidney	59	88	60	9	Stomach	21	61	23	2
Larynx	67	85	55	42	Testis	95	99	97	72
Liver	6	13	7	2	Thyroid	95	100	94	45
Lung	14	49	18	2	Urinary bladder	81	94	49	6
Melanoma	88	95	61	16					

*Adjusted for normal life expectancy. This chart is based on cases diagnosed from 1986 to 1993, followed through 1994.
Data source: NCI Surveillance, Epidemiology, and End Results Program, 1997.

Treatment: Surgery, radiation therapy, and chemotherapy are treatment options. Surgery usually includes the removal of one or both ovaries and fallopian tubes (salpingo-oophorectomy), and the uterus (hysterectomy). In some very early tumors, only the involved ovary will be removed, especially in young women who wish to have children. In advanced disease, an attempt is made to remove all intraabdominal disease to enhance the effect of chemotherapy.

Survival: Seventy-six percent of ovarian cancer patients survive one year after diagnosis; the 5-year relative survival rate for all stages is 46%. If diagnosed and treated early, the rate is 93%; however, only about 24% of all cases are detected at the localized stage. Five-year relative survival rates for women with regional and distant disease are 55% and 25%, respectively.

PANCREAS CANCER

New Cases: An estimated 29,000 new cases in the United States in 1998. The incidence of pancreatic cancer in African Americans is higher than in white Americans.

Deaths: An estimated 28,900 deaths in 1998. Since the early 1970s, mortality rates among white Americans have decreased slightly while mortality among African Americans has increased.

Signs and Symptoms: Cancer of the pancreas generally occurs without symptoms until it is in advanced stages. If a cancer develops in an area of the pancreas near the common bile duct, its blockage may lead to jaundice (a noticeable yellowing of the skin due to pigment accumulation). Sometimes the tumor is in an early stage.

Risk Factors: Very little is known about what causes the disease or how to prevent it. Risk increases after age 50. Smoking is a risk factor and incidence rates are more than twice as high for smokers as for nonsmokers. Some studies have suggested associations with chronic pancreatitis, diabetes, or cirrhosis. In countries where the diet is high in fat, pancreatic cancer rates are higher.

Early Detection: At present, only biopsy yields a certain diagnosis, and because of the "silent" course of the disease, the need for biopsy is likely to be obvious only after the disease has advanced. Researchers are focusing on ways to diagnose pancreatic cancer before symptoms occur.

Treatment: Surgery, radiation therapy, and chemotherapy are treatment options, but generally have little influence on the outcome. Clinical trials with several new agents could suggest improved survival and should be considered an option.

Survival: For all stages combined, the 1-year relative survival rate is only 18%, and the 5-year rate is 4%.

PROSTATE CANCER

New Cases: An estimated 184,500 new cases in the US during 1998. Prostate cancer incidence rates are nearly two times higher for African-American men than white men. Between 1989 and 1992, prostate cancer incidence rates increased dramatically, probably due to the increasing use of prostate-specific antigen (PSA) blood test screenings. In 1993 and 1994, prostate cancer incidence rates declined. It is not known whether rates will continue to decline, level off, or resume the pattern of increase in effect prior to PSA testing.

Deaths: An estimated 39,200 deaths in 1998, the second leading cause of cancer death in men. Prostate cancer mortality rates are more than two times higher for African-American men than white men.

Signs and Symptoms: Weak or interrupted urine flow; inability to urinate, or difficulty starting or stopping the urine flow; the need to urinate frequently, especially at night; blood in the urine; pain or burning on urination; continuing pain in lower back, pelvis, or upper thighs. Most of these symptoms are nonspecific and may be similar to those caused by benign conditions such as infection or prostate enlargement.

Risk Factors: The incidence of prostate cancer increases with age; more than 75% of all prostate cancers are diagnosed in men over age 65. African Americans have the highest prostate cancer incidence rates in the world; the disease is common in North America and Northwestern Europe and is rare in Asia, Africa, and South America. Recent genetic studies suggest that an inherited predisposition may be responsible for 5%-10% of prostate cancers. International studies suggest that dietary fat may also be a factor.

Early Detection: The Society's guidelines for early prostate cancer detection (see page 31) stress prostate-specific antigen (PSA) blood tests and digital rectal exams (DRE) of the prostate gland.

Treatment: Depending on age, stage of the cancer, and other medical conditions of the patient, surgery or radiation should be discussed with your health care provider. Hormones and chemotherapy or combinations of these options might be considered for metastatic disease. Hormone treatment may control prostate cancer for long periods by shrinking the size of the tumor, thus relieving pain. Careful observation without immediate active treatment ("watchful waiting") may be appropriate, particularly for older individuals with low-grade and/or early-stage tumors.

Survival: Fifty-eight percent of all prostate cancers are discovered while still localized; the 5-year relative survival rate for patients whose tumors are diagnosed at this stage is 100%. Over the past 20 years, the survival rate for all stages combined has increased from 67% to 89%. Survival after a diagnosis of prostate cancer continues to decline beyond five years. According to the most recent data, 67% of men diagnosed with prostate cancer survive 10 years and 50% survive 15 years.

SKIN CANCER

New Cases: Approximately one million cases a year of highly curable basal cell or squamous cell cancers. They are more common among individuals with lightly pigmented skin. The most serious form of skin cancer is melanoma, which is expected to be diagnosed in about 41,600 persons in 1998. Since 1973, the incidence rate of melanoma has increased about 4% per year from 5.7 per 100,000 in 1973 to 12.5 in 1994. Incidence rates are approximately 20 times higher among whites than among African Americans. Other important skin cancers include Kaposi's sarcoma and cutaneous T-cell lymphoma.

Deaths: An estimated 9,200 deaths this year, 7,300 from melanoma and 1,900 from other skin cancers. Mortality rates for melanoma have been relatively constant at about 2 per 100,000 since the late 1970s.

Signs and Symptoms: Any change on the skin, especially a change in the size or color of a mole or other darkly pigmented growth or spot. Scaliness, oozing, bleeding, or change in the appearance of a bump or nodule, the spread of pigmentation beyond its border, a change in sensation, itchiness, tenderness, or pain.

Risk Factors: Excessive exposure to ultraviolet radiation; fair complexion; occupational exposure to coal tar, pitch, creosote, arsenic compounds, or radium; family history, multiple nevi or atypical nevi.

Prevention: The sun's ultraviolet rays are strongest between 10 a.m. and 4 p.m.; exposure at these times should be limited or avoided. When outdoors, cover as much skin as possible with a hat that shades the face, neck, and ears, and a long-sleeved shirt and long pants. Sunscreen comes in various strengths, graded by the solar protection factor (SPF). Use a sunscreen with an SPF of 15 or higher. Because of the possible link between severe sunburns in childhood and greatly increased risk of melanoma in later life, children, in particular, should be protected from the sun.

Early Detection: Early detection is critical. Recognition of changes in skin growths or the appearance of new growths is the best way to find early skin cancer. Adults should practice skin self-exam regularly. Suspicious lesions should be evaluated promptly by a physician. Basal and squamous cell skin cancers often take the form of a pale, waxlike, pearly nodule, or a red, scaly, sharply outlined patch. A sudden or progressive change in a mole's appearance should be checked by a physician. Melanomas often start as small, mole-like growths that increase in size and change color. A simple ABCD rule outlines the warning signals of melanoma: A is for asymmetry. One half of the mole does not match the other half. B is for border irregularity. The edges are ragged, notched, or blurred. C is for color. The pigmentation is not uniform or intensely black. D is for diameter greater than 6 millimeters. Any sudden or progressive increase in size should be of particular concern.

Treatment: There are five methods of treatment for basal cell cancer and squamous cell cancer: surgery (used

Trends in 5-Year Relative Survival Rates* by Race and Year of Diagnosis, United States, 1960–1993

	White					African American				
	Relative 5-Year Survival Rate (Percent)					Relative 5-Year Survival Rate (Percent)				
Site	1960-63†	1970-73†	1974-76‡	1980-82‡	1986-93‡	1960-63†	1970-73†	1974-76‡	1980-82‡	1986-93‡
All sites	39	43	50	52	60§	27	31	39	40	44§
Brain	18	20	22	25	29§	19	19	27	31	35
Breast (female)	63	68	75	77	86§	46	51	63	66	70§
Cervix (uterus)	58	64	70	68	71	47	61	64	61	57§
Colon	43	49	50	56	63§	34	37	46	49	53§
Endometrium (uterus)	73	81	89	83	86§	31	44	61	54	55
Esophagus	4	4	5	8	12§	1	4	4	5	8§
Hodgkin's disease	40	67	72	75	82§	NC	NC	69	72	74
Kidney	37	46	52	51	60§	38	44	49	56	55§
Larynx	53	62	67	69	69	NC	NC	58	59	54
Leukemia	14	22	35	39	43§	NC	NC	31	33	33
Liver	NC	NC	4	4	6§	NC	NC	1	2	4§
Lung	8	10	12	14	14§	5	7	11	12	11
Melanoma	60	68	80	83	88§	NC	NC	66#	60#	67#
Multiple myeloma	12	19	24	28	28§	NC	NC	27	29	30
Non-Hodgkin's lymphoma	31	41	48	52	52§	NC	NC	48	51	44
Oral	45	43	55	55	55	NC	NC	36	31	34
Ovary	32	36	36	39	47§	32	32	40	38	42
Pancreas	1	2	3	3	4§	1	2	3	5	5§
Prostate	50	63	68	75	90§	35	55	58	65	75§
Rectum	38	45	49	53	61§	27	30	42	38	52§
Stomach	11	13	15	16	19§	8	13	17	19	20
Testis	63	72	79	92	95§	NC	NC	76#	90#	86
Thyroid	83	86	92	94	96§	NC	NC	88	95	89
Urinary bladder	53	61	74	79	83§	24	36	47	58	61§

*Rates are adjusted for normal life expectancy and are based on follow-up of patients through 1994. †Rates are based on End Results Group data from a series of hospital registries and one population-based registry. ‡Rates are from the SEER Program. §The difference in rates between 1974-76 and 1986-93 is statistically significant ($p < 0.05$). #The standard error of the survival rate is greater than 5 percentage points. NC=Valid survival rate could not be calculated.

Data source: NCI Surveillance, Epidemiology and End Results Program, 1997.

in 90% of cases), radiation therapy, electrodessication (tissue destruction by heat), cryosurgery (tissue destruction by freezing), and laser therapy for early skin cancer. For malignant melanoma, the primary growth must be adequately excised, and it may be necessary to remove nearby lymph nodes. Removal and microscopic examination of all suspicious moles is essential. Advanced cases of melanoma are treated according to the characteristics of the case.

Survival: For basal cell or squamous cell cancers, cure is highly likely if detected and treated early. Malignant melanoma can spread to other parts of the body quickly; however, when detected in its earliest stages, and with proper treatment, it is highly curable. The 5-year relative survival rate for patients with malignant melanoma is 88%. For localized malignant melanoma, the 5-year relative survival rate is 95%; and rates for regional and distant disease are 61% and 16%, respectively. About 82% of melanomas are diagnosed at a localized stage.

URINARY BLADDER CANCER

New Cases: An estimated 54,400 new cases in 1998. Bladder cancer rates are relatively stable at about 17 per 100,000. Overall, bladder cancer incidence is nearly four times higher in men than in women, and two times higher in whites than in African Americans.

Deaths: An estimated 12,500 deaths in 1998. Since the early 1970s, mortality rates for bladder cancer have decreased in both African Americans and whites.

Signs and Symptoms: Blood in the urine; usually associated with increased frequency of urination.

Risk Factors: Smoking is the greatest risk factor for bladder cancer, with smokers experiencing twice the risk of nonsmokers. Smoking is estimated to be responsible for approximately 47% of bladder cancer deaths among men and 37% among women. People living in urban areas and workers in dye, rubber, or leather industries also are at higher risk.

Early Detection: Bladder cancer is diagnosed by examination of cells in the urine and examination of the bladder wall with a cystoscope, a slender tube fitted with a lens and light that can be inserted into the tract through the urethra.

Treatment: Surgery, alone or in combination with other treatments, is used in more than 90% of cases. Preoperative chemotherapy alone or with radiation before cystectomy (bladder removal) has improved some treatment results.

Survival: When diagnosed at a localized stage, the 5-year relative survival rate is 94%; 74% of cancers are detected this early. For regional and distant stage, 5-year relative survival rates are 49% and 6%, respectively. Beyond five years, survival continues to decline with 76% of patients surviving 10 years after diagnosis, and 67% surviving 15 years.

CANCER IN CHILDREN

New Cases: An estimated 8,700 new cases in 1998; as a childhood disease, cancer is rare. Common sites include the blood and bone marrow, bone, lymph nodes, brain, sympathetic nervous system, kidneys, and soft tissues.

Deaths: An estimated 1,700 deaths in 1998, about one-third of them from leukemia. Despite its rarity, cancer is the chief cause of death by disease in children under age 15. Mortality rates have declined 57% since the early 1970s.

Early Detection: Cancers in children often are difficult to recognize. Parents should see that their children have regular medical checkups and should be alert to any unusual symptoms that persist. These include: an unusual mass or swelling; unexplained paleness and loss of energy; sudden tendency to bruise; a persistent, localized pain or limping; prolonged, unexplained fever or illness; frequent headaches, often with vomiting; sudden eye or vision changes; and excessive, rapid weight loss. Some of the main childhood cancers are:

- Leukemia (see page 11).
- Osteogenic sarcoma is a bone cancer which may cause no pain at first; swelling in the area of the tumor is often the first sign.
- Ewing's sarcoma is another type of cancer that arises in bone.
- Neuroblastoma can appear anywhere but usually appears in the abdomen, where a swelling occurs.
- Rhabdomyosarcoma, the most common soft tissue sarcoma, can occur in the head and neck area, genitourinary area, trunk, and extremities.
- Brain cancers in early stages may cause headaches, frequently with nausea and vomiting; blurred or double vision, dizziness, and difficulty in walking or handling objects.
- Non-Hodgkin's lymphomas and Hodgkin's disease are cancers that involve the lymph nodes, but also may invade bone marrow and other organs. They may cause swelling of lymph nodes in the neck, armpit, or groin. Other symptoms may include general weakness and fever.
- Retinoblastoma, an eye cancer, usually occurs in children under age 4. When detected early, cure is possible with appropriate treatment.
- Wilms' tumor, a kidney cancer, may be recognized by a swelling or lump in the abdomen.

Treatment: Childhood cancers can be treated by a combination of therapies chosen based on the specific type and stage of the cancer. Treatment is coordinated by a team of experts including oncologic physicians, pediatric nurses, social workers, psychologists, and others who assist children and their families.

Survival: Five-year survival rates vary considerably, depending on the site: all sites, 72%; bone cancer, 64%; neuroblastoma, 65%; brain and central nervous system, 61%; Wilms' tumor (kidney), 92%; Hodgkin's disease, 94%; and acute lymphocytic leukemia, 80%.

CANCER IN MINORITIES

In 1998, about 1,228,600 cancers are expected to be diagnosed in the United States and 564,800 American are expected to die of this disease.

Overall, African Americans are more likely to develop cancer than whites. In 1994, the incidence rate for African Americans was 454 per 100,000 and for whites, 394 per 100,000. Between 1990 and 1994, cancer incidence rates increased 1.2% per year in African Americans and decreased 0.8% per year in whites. African Americans have at least a 50% higher rate of cancer incidence than whites for multiple myeloma and cancers of the esophagus, cervix (uterus), larynx, prostate, stomach, liver, and pancreas.

African Americans are about 30% more likely to die of cancer than whites. In 1994, the cancer mortality rate for African Americans was 222 per 100,000 and for whites, 167 per 100,000. However, cancer mortality rates for both whites and African Americans have begun to decline recently. Between 1990 and 1994, mortality rates fell 0.3% per year for whites and 0.7% per year for African Americans. African Americans are at least 50% more likely to die of multiple myeloma and cancers of the esophagus, cervix (uterus), larynx, prostate, stomach, oral cavity, endometrium (uterus), liver, and pancreas than whites.

The 5-year relative survival rate for African Americans diagnosed with cancer between 1989 and 1993 was 44% compared with 60% for whites. Much of this difference in survival can be attributed to African Americans being diagnosed at a later stage of disease. Many cancers, including lung, prostate, colon and rectum and female breast are diagnosed more frequently at a localized stage in whites than in African Americans. Most of these sites represent cancers for which screening tests are available; and early detection and timely treatment could increase survival. Screening behaviors vary among racial and ethnic groups. Cultural values and belief systems can affect attitudes about cancer screening or seeking medical care. Factors such as a lack of health insurance or transportation can impede access to health care and can lead to late diagnoses and poorer survival.

Ten Leading Causes of Cancer Death and Percent of Total Cancer Deaths, by Race, US, 1994

	White	African American	Native American*†	Asian & Pacific Islander†	Hispanic‡
	All Sites 465,797 (100%)	All Sites 59,939 (100%)	All Sites 1,507 (100%)	All Sites 7,067 (100%)	All Sites 16,635 (100%)
1	Lung 131,763 (28%)	Lung 15,658 (26.1%)	Lung 418 (27.7%)	Lung 1,521 (21.5%)	Lung 2,969 (17.8%)
2	Colon & rectum 50,310 (10.8%)	Colon & rectum 6,222 (10.4%)	Colon & rectum 148 (9.8%)	Colon & rectum 727 (10.3%)	Colon & rectum 1,646 (9.9%)
3	Female breast 37,960 (8.1%)	Prostate 5,650 (9.4%)	Female breast 107 (7.1%)	Liver 645 (9.1%)	Female breast 1,368 (8.2%)
4	Prostate 28,912 (6.2%)	Female breast 5,083 (8.5%)	Prostate 82 (5.4%)	Stomach 569 (8.1%)	Prostate 1,015 (6.1%)
5	Pancreas 23,104 (5.0%)	Pancreas 3,255 (5.4%)	Stomach 63 (4.2%)	Female breast 494 (7.0%)	Pancreas 926 (5.6%)
6	Non-Hodgkin's lymphoma 20,161 (4.3%)	Stomach 2,206 (3.7%)	Pancreas 62 (4.1%)	Pancreas 413 (5.8%)	Stomach 867 (5.2%)
7	Leukemia 17,852 (3.8%)	Esophagus 1,948 (3.2%)	Non-Hodgkin's lymphoma 55 (3.6%)	Non-Hodgkin's lymphoma 295 (4.2%)	Non-Hodgkin's lymphoma 836 (5.0%)
8	Ovary 12,256 (2.6%)	Leukemia 1,653 (2.8%)	Kidney 53 (3.5%)	Leukemia 288 (4.1%)	Leukemia 806 (4.8%)
9	Brain 11,465 (2.5%)	Multiple myeloma 1,639 (2.7%)	Liver 49 (3.3%)	Prostate 258 (3.7%)	Liver 733 (4.4%)
10	Stomach 10,732 (2.3%)	Non-Hodgkin's lymphoma 1,297 (2.2%)	Leukemia 40 (2.7%)	Ovary 173 (2.4%)	Ovary 439 (2.6%)

Note: Since each column includes only the top 10 cancer sites, site-specific numbers and percentages do not add up to All Sites totals.
*Includes American Indians and Native Alaskans. †Numbers are likely underestimates due to underreporting of Asian, Pacific Islander, and Native American race on death certificates. ‡Persons classified as Hispanic may be of any race. Hispanic origin is reported for all states except New Hampshire and Oklahoma. In 1990, the 48 states from which data were collected accounted for about 99.6% of the Hispanic population in the United States.
Data source: Vital Statistics of the United States, 1997.

Cancer Around the World, 1992-1995, Death Rates† per 100,000 Population for 46 Countries

Country	All Sites		Oral		Colon & Rectum		Breast	Prostate	Lung		Uterus		Stomach		Leukemia	
	Male	Female	Male	Female	Male	Female	Female	Male	Male	Female	Cervix	Other	Male	Female	Male	Female
United States#	162.7 (25)	110.4 (9)	3.4 (32)	1.2 (9)	16.0 (27)	10.9 (22)	21.1 (15)	17.3 (11)	55.3 (15)	26.3 (1)	2.5 (33)	2.5 (35)	4.7 (46)	2.5 (35)	6.4 (9)	3.8 (12)
Albania#	91.1 (44)	40.0 (46)	4.0 (30)	1.6 (4)	2.3 (46)	2.1 (46)	4.9 (46)	7.0 (36)	26.3 (39)	4.9 (41)	0.4 (46)	2.5 (34)	12.9 (31)	2.5 (34)	2.8 (45)	2.2 (45)
Armenia*	139.3 (36)	86.2 (32)	2.1 (43)	0.6 (44)	9.0 (36)	7.1 (36)	16.3 (29)	3.4 (43)	42.4 (29)	6.8 (29)	4.6 (18)	4.1 (19)	20.8 (17)	4.1 (19)	4.2 (35)	2.6 (42)
Australia**	159.3 (28)	99.3 (24)	4.4 (26)	1.3 (8)	20.5 (11)	13.6 (10)	20.1 (16)	19.4 (7)	40.0 (32)	13.2 (9)	2.6 (32)	1.6 (45)	6.6 (44)	1.6 (45)	6.1 (13)	3.9 (9)
Austria^	167.7 (23)	104.4 (19)	6.1 (18)	1.0 (27)	22.6 (7)	13.1 (12)	21.6 (13)	17.3 (12)	42.8 (27)	9.7 (15)	2.8 (31)	4.6 (14)	14.4 (26)	4.6 (14)	5.2 (26)	3.4 (22)
Azerbaijan**	114.8 (42)	61.7 (45)	3.0 (33)	0.7 (41)	6.5 (40)	4.8 (41)	9.0 (39)	4.3 (40)	25.7 (40)	4.5 (43)	1.5 (41)	4.3 (18)	24.8 (13)	4.3 (18)	4.0 (37)	2.7 (38)
Belarus#	219.2 (7)	95.2 (28)	8.8 (9)	0.7 (40)	15.6 (29)	10.3 (27)	14.4 (35)	8.0 (33)	60.4 (13)	5.0 (39)	4.4 (19)	3.9 (21)	36.7 (2)	3.9 (21)	5.7 (19)	3.4 (20)
Bulgaria**	145.3 (33)	85.9 (34)	4.6 (24)	0.7 (38)	16.2 (24)	11.0 (21)	15.6 (33)	8.7 (31)	42.9 (26)	6.6 (31)	4.6 (16)	6.1 (2)	19.1 (22)	6.1 (2)	4.6 (32)	2.8 (35)
Canada**	159.4 (27)	108.0 (13)	4.0 (31)	1.2 (10)	16.2 (23)	10.6 (26)	22.0 (12)	16.7 (15)	52.5 (16)	22.9 (3)	2.0 (36)	2.2 (41)	6.4 (45)	2.2 (41)	5.6 (20)	3.5 (19)
Chile*	139.3 (37)	108.2 (12)	2.2 (41)	0.6 (45)	6.2 (41)	6.3 (38)	12.1 (36)	14.5 (21)	22.0 (42)	6.4 (32)	11.2 (2)	2.5 (36)	32.0 (4)	2.5 (36)	3.6 (40)	3.3 (27)
China##‡	149.9 (29)	83.5 (37)	2.6 (38)	1.1 (18)	7.9 (38)	6.4 (37)	5.0 (45)	—	37.3 (34)	15.8 (8)	3.0 (29)	0.7 (46)	26.9 (12)	0.7 (46)	3.7 (38)	3.0 (32)
Croatia**	202.6 (13)	96.4 (27)	11.7 (3)	1.1 (17)	19.5 (12)	11.1 (20)	18.1 (21)	13.9 (22)	61.9 (11)	8.0 (22)	3.0 (30)	4.8 (11)	21.5 (16)	4.8 (11)	5.6 (21)	3.4 (24)
Czech Republic#	233.9 (3)	127.1 (3)	6.1 (19)	1.0 (28)	34.4 (1)	18.2 (2)	21.4 (14)	15.5 (18)	74.0 (2)	10.3 (14)	5.7 (11)	5.1 (5)	16.1 (24)	5.1 (5)	6.8 (4)	4.2 (5)
Denmark#	179.2 (17)	138.6 (1)	4.1 (29)	1.4 (6)	23.2 (5)	17.2 (4)	27.2 (2)	20.4 (5)	50.4 (18)	24.9 (2)	4.7 (15)	3.3 (25)	6.8 (43)	3.3 (25)	6.3 (10)	3.7 (13)
Estonia**	224.7 (5)	111.4 (8)	9.0 (8)	1.1 (14)	18.5 (14)	12.9 (13)	16.7 (26)	13.2 (24)	67.4 (5)	7.2 (24)	6.8 (7)	5.0 (7)	27.9 (10)	5.0 (7)	6.6 (6)	4.2 (4)
Finland**	146.8 (31)	87.6 (31)	2.1 (42)	0.9 (31)	12.8 (33)	8.4 (34)	16.4 (28)	18.3 (10)	44.2 (24)	6.9 (26)	1.3 (43)	2.5 (31)	10.7 (34)	2.5 (31)	4.8 (31)	3.3 (26)
France**	193.6 (14)	86.0 (33)	12.0 (2)	1.3 (7)	17.1 (21)	10.0 (30)	19.7 (18)	16.3 (17)	47.0 (22)	5.6 (37)	1.7 (40)	3.6 (24)	7.6 (41)	3.6 (24)	5.7 (18)	3.4 (25)
Germany**	176.6 (18)	107.5 (15)	6.7 (15)	1.2 (12)	21.4 (8)	15.0 (5)	22.1 (11)	16.9 (14)	47.3 (21)	8.8 (18)	3.3 (28)	3.0 (27)	13.3 (28)	3.0 (27)	5.8 (15)	3.6 (17)
Greece**	145.1 (35)	78.4 (39)	1.9 (44)	0.5 (46)	7.8 (39)	5.9 (39)	15.9 (31)	8.9 (30)	49.8 (19)	6.9 (27)	1.2 (44)	2.6 (30)	8.7 (38)	2.6 (30)	5.8 (16)	3.7 (14)
Hungary^	265.0 (1)	138.0 (2)	18.5 (1)	2.4 (1)	32.0 (2)	19.0 (1)	23.9 (8)	16.5 (16)	84.0 (1)	17.9 (5)	6.3 (8)	5.0 (8)	22.1 (14)	5.0 (8)	7.2 (2)	4.7 (1)
Ireland*	176.2 (19)	125.4 (4)	4.2 (27)	1.1 (19)	21.3 (9)	14.5 (6)	27.4 (1)	18.9 (9)	45.4 (23)	17.6 (6)	3.3 (27)	2.5 (33)	13.0 (30)	2.5 (33)	6.5 (7)	2.7 (36)
Israel**	123.9 (40)	102.0 (22)	1.5 (46)	0.7 (43)	16.6 (22)	13.4 (11)	24.3 (5)	11.2 (27)	27.0 (38)	8.4 (20)	1.4 (42)	2.5 (32)	8.8 (37)	2.5 (32)	5.5 (23)	4.2 (6)
Italy*	184.6 (16)	96.7 (26)	5.7 (21)	1.0 (23)	15.3 (31)	10.0 (29)	19.8 (17)	11.2 (26)	56.2 (14)	7.9 (23)	0.8 (45)	4.4 (16)	15.5 (25)	4.4 (16)	6.4 (8)	4.0 (8)
Japan**	149.4 (30)	74.5 (42)	2.5 (39)	0.7 (42)	16.1 (26)	9.8 (31)	6.8 (44)	4.2 (41)	31.0 (36)	8.3 (21)	1.8 (38)	2.1 (43)	31.4 (5)	2.1 (43)	4.1 (36)	2.6 (40)
Kazakhistan**	214.6 (8)	104.0 (20)	8.0 (12)	1.9 (2)	12.5 (34)	8.7 (33)	8.5 (41)	5.6 (39)	66.7 (6)	8.6 (19)	6.0 (10)	4.5 (15)	34.3 (3)	4.5 (15)	3.6 (39)	2.4 (44)
Kyrgzstan**	138.6 (38)	77.3 (40)	4.1 (28)	0.8 (35)	8.1 (37)	5.8 (40)	10.4 (37)	4.2 (42)	29.7 (37)	4.9 (40)	6.0 (9)	3.7 (23)	30.0 (8)	3.7 (23)	3.4 (42)	2.2 (46)
Latvia**	225.1 (4)	106.6 (17)	7.3 (13)	0.9 (30)	18.4 (15)	11.7 (18)	17.1 (25)	11.5 (25)	65.2 (7)	6.2 (33)	4.6 (17)	5.5 (4)	28.5 (9)	5.5 (4)	6.1 (12)	4.1 (7)
Lithuania**	212.1 (9)	105.4 (18)	8.3 (10)	0.9 (32)	17.6 (18)	11.7 (17)	18.8 (20)	14.6 (20)	63.6 (9)	5.5 (38)	7.0 (5)	5.1 (6)	27.8 (11)	5.1 (6)	7.9 (1)	4.6 (2)
Mauritius**	84.5 (45)	67.6 (44)	4.6 (25)	0.8 (37)	5.5 (42)	4.1 (43)	8.5 (42)	8.0 (32)	16.3 (45)	3.8 (45)	5.5 (13)	8.4 (1)	13.8 (27)	8.4 (1)	3.3 (43)	2.7 (37)
Mexico#	80.1 (46)	77.2 (41)	1.7 (45)	0.7 (39)	3.2 (45)	3.1 (45)	8.7 (40)	10.5 (28)	16.1 (46)	5.8 (36)	14.4 (1)	2.0 (44)	9.7 (36)	2.0 (44)	3.6 (41)	3.0 (33)
Netherlands**	186.9 (15)	108.4 (11)	2.8 (37)	1.1 (21)	17.8 (17)	12.7 (14)	26.6 (3)	19.0 (8)	64.6 (8)	12.6 (10)	1.9 (37)	2.3 (40)	11.4 (32)	2.3 (40)	5.8 (17)	3.1 (29)
New Zealand#	171.8 (21)	120.2 (6)	2.9 (35)	1.1 (16)	25.9 (3)	17.6 (3)	24.0 (6)	20.2 (6)	41.5 (31)	17.6 (7)	3.5 (25)	2.4 (39)	8.5 (39)	2.4 (39)	7.2 (3)	3.6 (15)
Norway#	146.7 (32)	99.3 (23)	2.8 (36)	1.0 (26)	20.8 (10)	14.2 (7)	19.1 (19)	23.8 (1)	31.6 (35)	10.9 (11)	3.8 (20)	2.4 (37)	9.9 (35)	2.4 (37)	4.3 (34)	2.7 (39)
Poland^	204.7 (10)	107.5 (16)	6.3 (17)	1.1 (20)	15.9 (28)	10.7 (23)	16.0 (30)	10.5 (29)	71.4 (4)	10.6 (13)	7.5 (4)	3.8 (22)	20.2 (20)	3.8 (22)	5.6 (22)	3.4 (21)
Portugal^	203.7 (12)	114.3 (7)	8.3 (11)	1.2 (11)	22.6 (6)	13.8 (8)	24.0 (7)	21.4 (3)	38.0 (33)	6.2 (34)	3.4 (26)	6.1 (3)	30.3 (7)	6.1 (3)	6.7 (5)	4.5 (3)
Romania#	162.7 (26)	91.2 (30)	11.1 (5)	1.0 (24)	16.2 (25)	10.7 (24)	17.5 (24)	5.7 (38)	43.3 (25)	6.1 (35)	7.0 (6)	4.7 (13)	20.5 (18)	4.7 (13)	5.2 (27)	3.6 (16)
Rep. of Moldova**	145.2 (34)	85.5 (35)	6.7 (16)	1.0 (25)	10.5 (35)	7.4 (35)	14.8 (34)	7.9 (34)	42.7 (28)	6.8 (30)	10.3 (3)	4.4 (17)	18.2 (23)	4.4 (17)	4.5 (33)	3.0 (34)
Russian Fed.**	241.3 (2)	107.7 (14)	9.2 (7)	1.0 (22)	18.0 (16)	12.4 (16)	15.6 (32)	7.2 (35)	72.3 (3)	7.2 (25)	5.0 (14)	4.8 (10)	38.7 (1)	4.8 (10)	5.4 (25)	3.5 (18)
Slovania^	204.1 (11)	109.0 (10)	11.2 (4)	0.9 (34)	23.5 (4)	13.7 (9)	22.5 (10)	14.7 (19)	61.6 (12)	9.0 (17)	3.6 (22)	4.8 (12)	21.9 (15)	4.8 (12)	5.4 (24)	3.8 (11)
Spain#	171.3 (22)	79.6 (38)	7.0 (14)	0.8 (36)	15.3 (30)	9.6 (32)	17.6 (22)	13.5 (23)	47.9 (20)	3.6 (46)	1.7 (39)	3.3 (26)	13.2 (29)	3.3 (26)	5.0 (28)	3.3 (28)
Sweden#	126.5 (39)	97.1 (25)	2.4 (40)	0.9 (33)	14.5 (32)	10.7 (25)	17.6 (23)	21.3 (4)	22.9 (41)	10.8 (12)	2.1 (35)	2.7 (29)	7.3 (42)	2.7 (29)	4.9 (29)	3.4 (23)
Switzerland**	163.3 (24)	94.7 (29)	5.7 (22)	1.2 (13)	17.5 (19)	10.2 (28)	23.4 (9)	22.5 (2)	41.9 (30)	9.3 (16)	2.4 (34)	3.0 (28)	8.2 (40)	3.0 (28)	5.8 (14)	3.1 (30)
Turkmenistan**	115.5 (41)	83.7 (36)	6.0 (20)	1.7 (3)	5.3 (43)	4.3 (42)	9.4 (38)	1.7 (44)	18.5 (43)	4.4 (44)	3.7 (21)	4.1 (20)	20.3 (19)	4.1 (20)	2.7 (46)	2.6 (41)
Ukraine*	220.4 (6)	103.1 (21)	9.6 (6)	0.9 (29)	17.3 (20)	11.4 (19)	16.5 (27)	6.8 (37)	62.6 (10)	6.9 (28)	5.6 (12)	4.9 (9)	31.2 (6)	4.9 (9)	6.2 (11)	3.8 (10)
United Kingdom**	173.7 (20)	121.3 (5)	3.0 (34)	1.1 (15)	19.4 (13)	12.7 (15)	26.5 (4)	17.1 (13)	51.8 (17)	20.9 (4)	3.5 (24)	2.2 (42)	10.8 (33)	2.2 (42)	4.9 (30)	3.0 (31)
Uzbekistan#	110.4 (43)	70.6 (43)	4.6 (23)	1.5 (5)	4.8 (44)	3.8 (44)	7.6 (43)	1.4 (45)	18.2 (44)	4.7 (42)	3.5 (23)	2.4 (38)	19.6 (21)	2.4 (38)	3.1 (44)	2.6 (43)

Note: Figures in parentheses are order of rank within site and sex group.

†Rates are age-adjusted to the World Health Organization world standard population. ‡Oral cancer mortality rate includes nasopharynx only. *92 only #92-93 ** 92-94 ##94 only ^92-95

American Cancer Society, Surveillance Research, 1998. Data source: World Health Organization, 1996.

SPECIAL SECTION: PROSTATE CANCER

Excluding skin cancer, cancer of the prostate is the most common malignancy and the second leading cause of cancer death among men in the US.

INCIDENCE AND MORTALITY

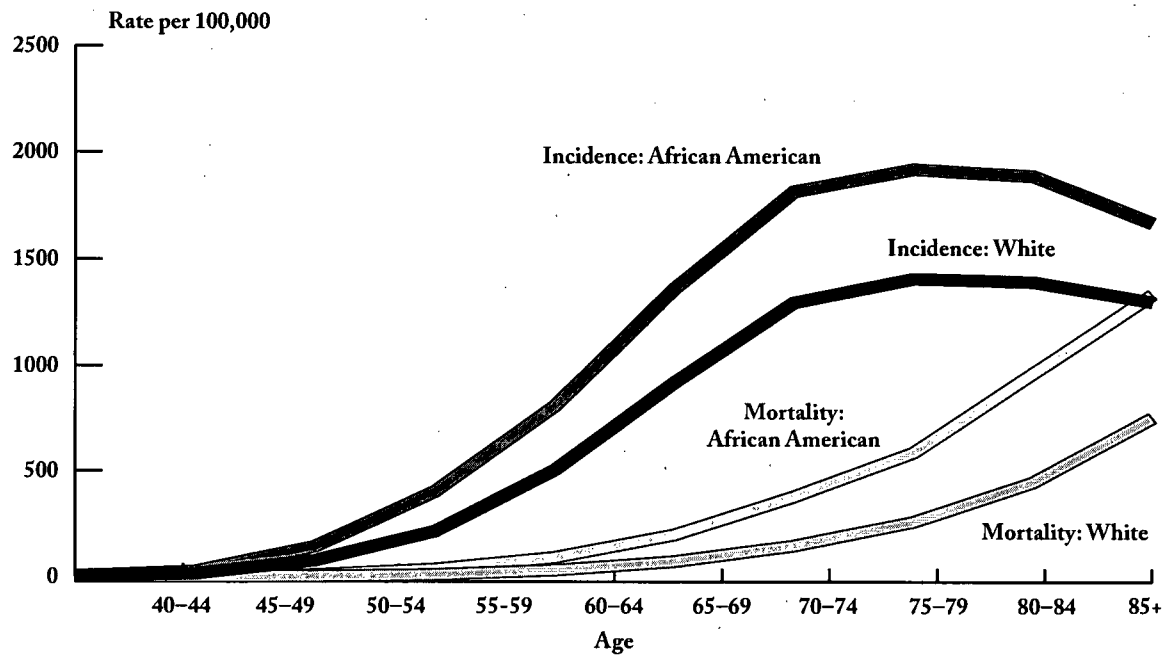
Age: The incidence and mortality of prostate cancer increase with age (Figure 1); 77% of men with new diagnoses of prostate cancer each year are over the age of 65. Prostate cancer is rare in younger men, with an incidence rate of less than one case per 100,000 for men under age 40. However, the rate climbs to 82 per 100,000 for men ages 50-54, 518 for men ages 60-64, and 1,326 for men ages 70-74.[1]

Race: At all ages, African-American men are more likely to develop prostate cancer than white men (Figure 1). In 1994, the incidence rate for white men was 135 per 100,000 and for African-American men, 234. In that same year, African-American men were also more likely to die of prostate cancer (56 per 100,000) than white men (24 per 100,000).[1]

Prostate cancer incidence and mortality rates vary among racial and ethnic groups (Figure 2). Between 1988 and 1992, incidence and mortality rates in African-American men were at least two times higher than rates for other racial and ethnic groups; the high rate of prostate cancer incidence in white men was the only exception.[2] Among different Asian populations in the US, incidence rates ranged from 24.2 per 100,000 for Korean men to 88.0 for Japanese men and mortality rates from 6.6 per 100,000 for Chinese men to 19.9 for Hawaiian men.[2]

Trends over time: Prostate cancer incidence rates have increased for both white and African-American men—from 63 per 100,000 in 1973 to 135 in 1994 for white men and from 106 to 234 for African-American men over the same time period (Figure 3).[1] Mortality rates for white men remained relatively stable between 1973

Figure 1. Prostate Cancer—Age-Specific Incidence and Mortality Rates* by Race, US, 1990–1994



*Per 100,000, age-adjusted to the 1970 US standard population.
American Cancer Society, Surveillance Research, 1998.
Data source: NCI, Surveillance, Epidemiology, and End Results Program, 1997.

and 1994, while mortality among African-American men increased from 40 to 56 per 100,000.

During the late 1980s prostate cancer incidence began to rise rapidly, followed by a sharp decline beginning in 1992 for whites and 1993 for African Americans. This trend is likely related to the effects of prostate-specific antigen (PSA) screening. When a screening test, such as PSA, is widely utilized in a population, the incidence rate for the disease under scrutiny will increase as the result of early diagnosis of cancers that otherwise would have been diagnosed later. Prostate cancer incidence rates are expected to continue to decline and may stabilize at the rates in effect prior to the widespread use of PSA screening.[3]

WHO SURVIVES PROSTATE CANCER?

Survival by stage at diagnosis

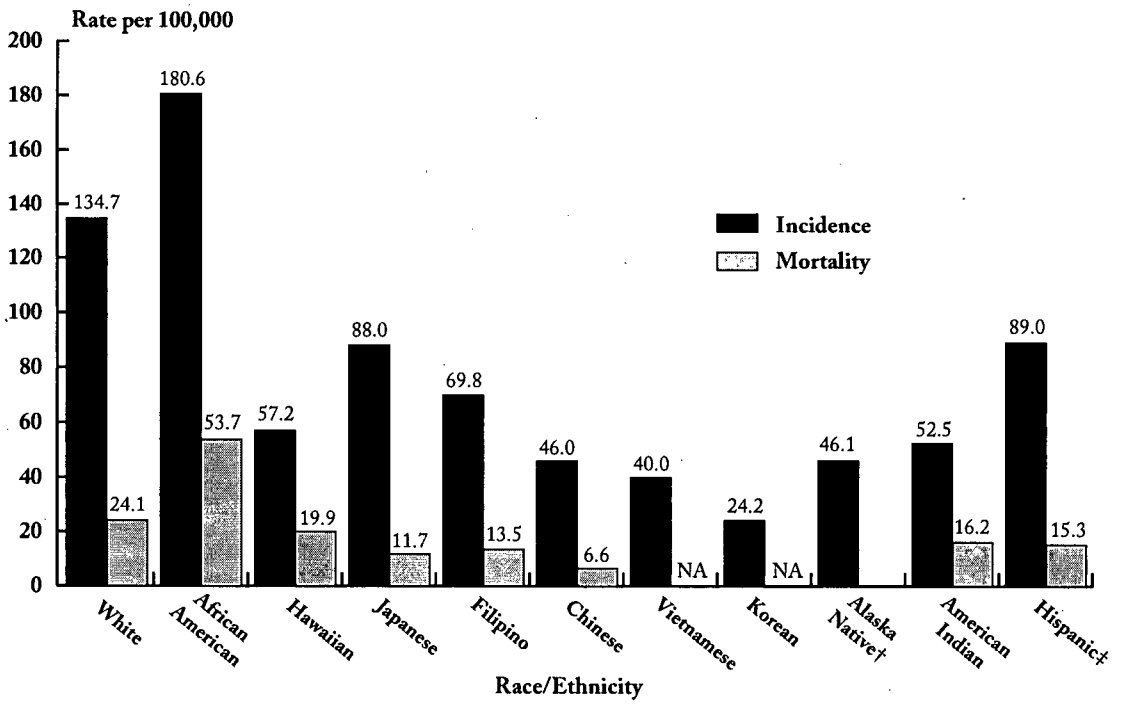
Generally, survival has an inverse relationship with the stage of cancer at time of detection—the more advanced the stage, the lower the survival rate (Figures 4A and 4B). According to the most recently available data, 5-year relative survival rates by stage of disease at diagnosis are:[1]

- 100% when cancer is diagnosed at a local stage (confined to the prostate); 58% of prostate cancers are diagnosed at this stage.
- 94.1% when cancer is diagnosed at a regional stage (cancer has spread to surrounding tissue); 18% of prostate cancers are diagnosed at this stage.
- 30.9% when cancer is diagnosed at a distant stage (cancer has metastasized); 11% of prostate cancers are diagnosed at this stage.

Survival by racial/ethnic groups

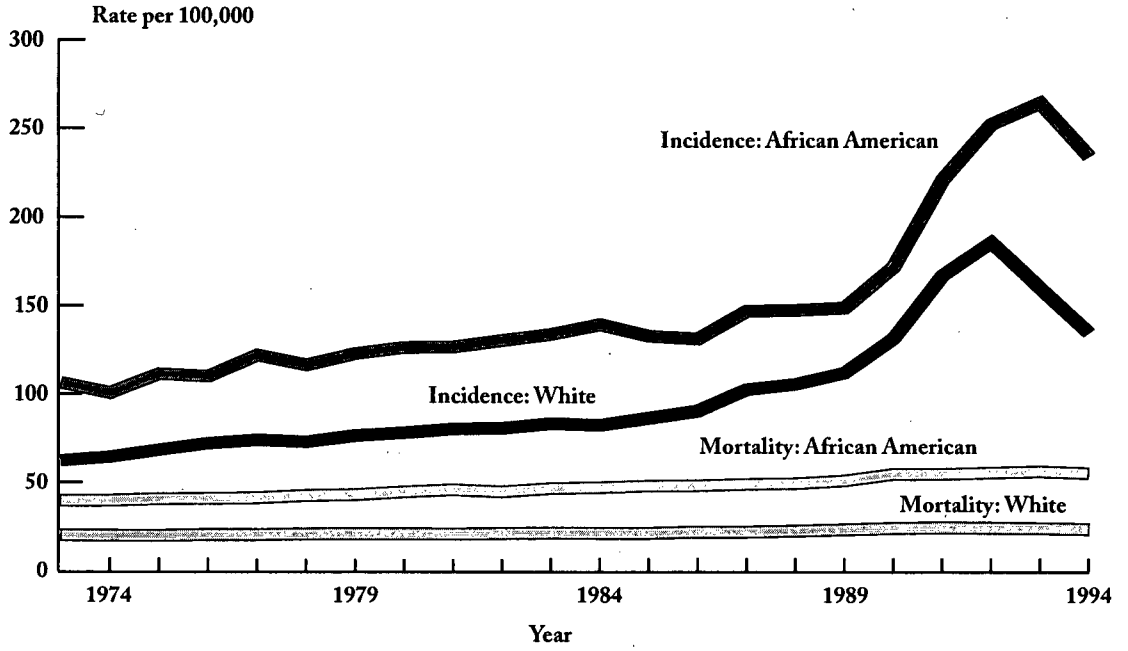
Five-year relative survival rates vary by race and ethnicity.[1] African-American men with prostate cancer are less likely than white men to survive five years (5-year relative survival rates are 75% and 90%, respectively).

Figure 2. Prostate Cancer—Incidence and Mortality Rates* by Race and Ethnicity, US, 1988–1992



*Per 100,000, age-adjusted to the 1970 US standard population.
†Mortality rate not calculated for fewer than 25 deaths. ‡Persons of Hispanic origin may be of any race. NA=Data not available.
American Cancer Society, Surveillance Research, 1998.
Data source: NCI Surveillance, Epidemiology, and End Results Program, 1997.

Figure 3. Prostate Cancer—Incidence and Mortality Rates* by Race, US, 1973–1994



*Per 100,000, age-adjusted to the 1970 US standard population.
American Cancer Society, Surveillance Research, 1998.
Data source: NCI Surveillance, Epidemiology, and End Results Program, 1997.

Who Is at Risk of Developing Prostate Cancer?

Risk factors for prostate cancer

Most of what is known about prostate cancer risk factors pertains to personal characteristics, e.g., age, family history, etc., that are likely to be only indirectly associated with what actually causes this disease.

Possible risk factors for prostate cancer currently under investigation include:[4]

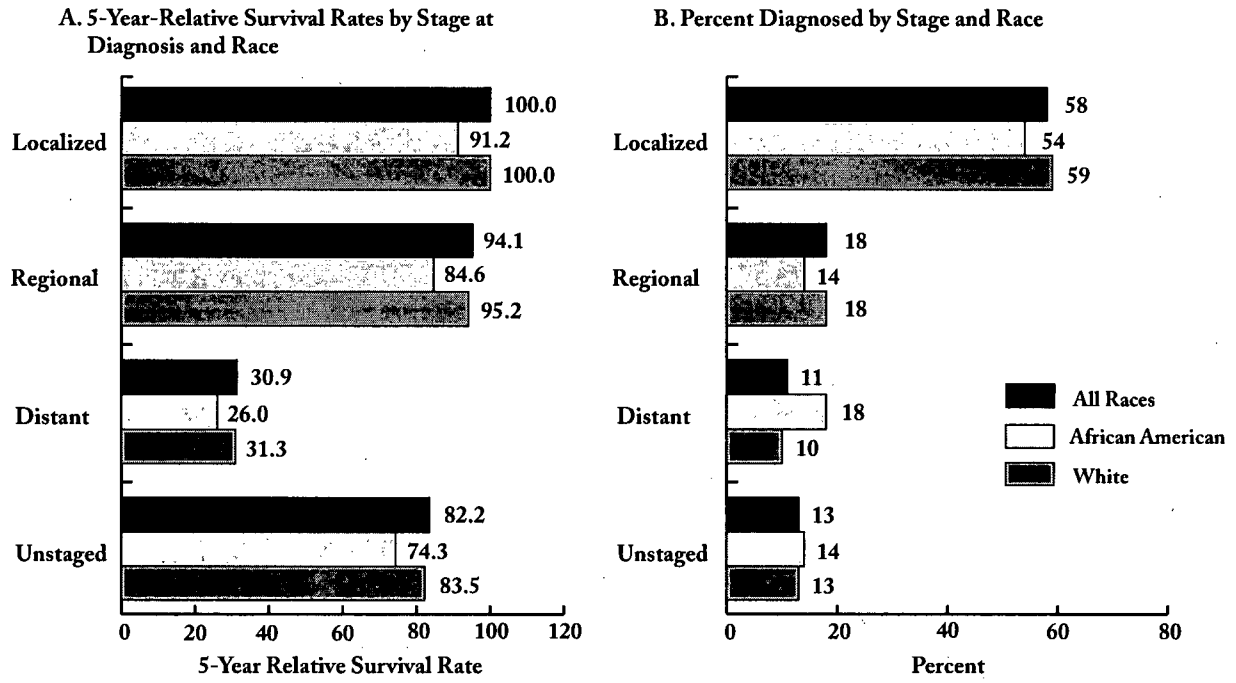
- *African-American race.* The incidence rate of prostate cancer is nearly two times higher in African American men when compared to white men.
- *Increasing age.* Besides being male, age is the single most important risk factor for the development of prostate cancer.
- *Family history of prostate cancer.* Some studies have shown an overall two- to three-fold increase in the risk of prostate cancer in men with a positive family history. The number of affected family relatives and younger age at diagnosis appear to be influential familial factors.
- *Diet.* A diet high in animal fat may approximately double the risk of developing prostate cancer. Consumption of lycopene, an antioxidant found in tomatoes and tomato-based products, may be associated with a decreased risk of prostate cancer.
- *Hormonal factors.* Men with high plasma testosterone levels may be at an increased risk of developing prostate cancer.

What Are the Current Disease Control Strategies for Prostate Cancer?

Currently, increased participation in early detection screening programs, with diagnosis of the disease at an early stage, offers the best opportunity for successful treatment of prostate cancer. PSA blood test and digital rectal examination (DRE) of the prostate gland are the most common methods utilized and can be useful in detecting cancer in an asymptomatic man.

Prostate-Specific Antigen (PSA). A PSA blood test is used to measure a protein that is made by prostate cells. PSA

Figure 4. Prostate Cancer—United States, 1986–1993



American Cancer Society, Surveillance Research, 1998.
Data source: NCI Surveillance, Epidemiology, and End Results Program, 1997.

blood tests are reported as nanograms per milliliter. Results under 4 ng/mL are usually considered normal while results over 10 ng/mL are considered high, and values between 4 and 10 are borderline. The higher the PSA level, the more likely the presence of prostate cancer. The test alone, however, does not provide a definite answer. Some conditions such as benign prostatic hyperplasia (noncancerous prostate enlargement) and prostatitis (inflammation of the prostate) can cause a borderline or high test result in men who do not have prostate cancer. Men with results over 10 ng/mL are advised to have a biopsy to determine whether or not cancer is present. For men whose PSA is in the borderline range and whose DRE findings are normal, a percent-free PSA measurement may be used to determine if cancer is likely to be present and if the patient should undergo biopsy. The role of percent-free PSA measurement, however, is still emerging. Men with results below 4 ng/mL are unlikely to have prostate cancer, especially if their DRE findings are also normal. However, studies have shown that up to 25% of men whose PSA level is below 4 ng/mL may still develop prostate cancer.[5]

Like the percent-free PSA measurement, the PSA density and the PSA velocity are methods that are sometimes helpful in evaluating the significance of borderline PSA elevations. The PSA velocity measures how quickly the PSA level rises over a period of time. The PSA density reflects the relationship between the PSA level and the size of the gland (measured by transrectal ultrasound [TRUS]).

Because PSA levels tend to increase with age, age-specific reference ranges may be used to determine what values are considered non-normal. Also, studies of PSA specificity suggest that different normal ranges may apply to African-American and white men.[6]

Digital Rectal Examination (DRE). Most prostate cancers begin in the posterior part of the gland that can be reached by a digital rectal examination. During a DRE, a physician inserts a gloved, lubricated finger into the rectum to feel for any irregular or abnormally firm area that may be cancer. A DRE should be performed by a health care professional skilled in recognizing subtle prostate abnormalities, including those of symmetry and consistency, as well as the more classic findings of marked induration or nodules. DRE is less efficient in detecting prostate carcinoma than a PSA blood test. If a man's DRE has an abnormal finding, he will likely be advised to undergo a TRUS for a more detailed diagnosis.

Transrectal Ultrasound (TRUS). Transrectal ultrasound uses sound waves released from a small probe placed in the rectum to create an image of the prostate on a screen. Because prostate tumors and normal prostate tissue often reflect sound waves differently, this test is useful in detecting tumors, even those too small to be felt by DRE. Insertion of the TRUS probe may be temporarily uncomfortable; however, the test itself is painless and only takes about 20 minutes. TRUS can be used to guide a biopsy needle into abnormal-appearing areas.

Screening guidelines

The American Cancer Society's recommendations for prostate cancer detection in asymptomatic men are that annual PSA and DRE should be offered:

- To men aged 50 and older who have at least a 10-year life expectancy.
- To younger men at higher risk, such as African-American men or men with a strong familial predisposition to prostate cancer (two or more affected first-degree relatives, e.g., father, brother).

Patients should be given information regarding the potential risks and benefits of intervention.

There is controversy concerning the recommendations for prostate cancer screening. The recommendations of the American Urology Association are similar to those of the ACS. However, some national organizations do not recommend routine screening because of a lack of prospective randomized studies that establish an association between decreased prostate cancer mortality and routine PSA screening. Although not conclusive, there is some evidence that prostate cancer screening has resulted in men being diagnosed at earlier stages of disease and at younger ages, which could ultimately decrease mortality and improve the opportunity for successful treatment.

How Is Prostate Cancer Treated?

Treatment decisions are made by the patient and the physician, after consideration of the optimal treatment for the stage of cancer, the patient's age preferences, and co-existing illnesses, and risks and benefits ascribed to each treatment protocol.

Radical prostatectomy: the removal of the prostate and some of the tissue surrounding the gland. This surgery is done only if the cancer has not spread outside the prostate gland. Impotence and urinary incontinence are potential complications.

Radiation therapy: the use of high-energy x-rays to kill cancer cells and shrink tumors. Radiation is administered from machines outside the body (external beam radiation) or through brachytherapy (implantation of radioisotopes into the prostate gland). Impotence and urinary incontinence occur slightly less often than after surgery; however, damage to the rectum is a potential complication.

Hormone therapy: affecting hormone levels to inhibit cancer cell growth. The male hormone testosterone may promote the growth of prostate cancer cells. To cause cancer cells to shrink, patients may be given drugs such as LHRH-agonists, which decrease the amount of testosterone in the body, or antiandrogens, which block the activity of testosterone. Orchiectomy, or surgery to remove the testicles, is another technique used to reduce hormone levels. Female hormones (estrogens) may also be used, but they have been associated with a risk of cardiovascular side effects. Hot flashes, impotence, and loss of sexual desire are common side effects.

Transurethral resection: the removal of the cancerous section of the prostate gland using a small wire loop that is placed in the prostate through the urethra. This procedure is often performed to relieve symptoms of urinary obstruction caused by the tumor or in men who cannot have a radical prostatectomy due to age or other illnesses.

Chemotherapy: chemotherapy is sometimes used to treat prostate cancer that has recurred after other treatment.

Watchful waiting: careful observation without further immediate treatment. This may be an appropriate option for men who are found to have less aggressive tumors, are older than 70, have significant co-existing illnesses, or are fearful of the side effects of more aggressive therapies.

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TOBACCO USE

Smoking is the most preventable cause of death in our society. During 1995, approximately 2.1 million people in developed countries died as a result of smoking.[1] Tobacco use is responsible for nearly one in five deaths in the United States. Based on data from the American Cancer Society's Cancer Prevention Study II, it is estimated that 419,000 US deaths were attributable to smoking in 1990.[2] Although the number of cardiovascular deaths is declining, smoking-related cancer deaths continue to rise. Since 1987, more women have died each year from lung cancer than breast cancer, which was the major cause of cancer death in women for over 40 years. Approximately half of all continuing smokers die prematurely from smoking. Of these, approximately half die in middle age (35-69), losing an average of 20 to 25 years of life expectancy.

Lung cancer mortality rates are about 23 times higher for current male smokers and 13 times higher for current female smokers compared to lifelong never-smokers.[3] In addition to being responsible for 87% of lung cancers, smoking is also associated with cancers of the mouth, pharynx, larynx, esophagus, pancreas, uterine cervix, kidney, and bladder. Smoking accounts for at least 29% of all cancer deaths, is a major cause of heart disease, and is associated with conditions ranging from colds and gastric ulcers to chronic bronchitis, emphysema, and cerebrovascular disease.

Trends in Smoking

The National Health Interview Survey (NHIS) data show that cigarette smoking among adults aged 18 and over declined 40% between 1965 and 1990—from 42% to 25%.[4] However, between 1990 and 1994, overall smoking prevalence was virtually unchanged. Between 1983 and 1994:

- Smoking prevalence among men 18 and older declined from 34% to 28% among white men, and from 41% to 34% among African-American men.
- Smoking prevalence among women 18 and older declined from 30% to 24% among white women; from 32% to 21% among African-American women.
- Smoking prevalence among college graduates declined 43% from 21% to 12% and among adults without a high school education declined 22% from 41% to 32%.
- Per capita consumption of cigarettes continues to decline. After peaking at 4,345 in 1963, consumption among Americans 18 years and older has decreased 43% to an estimated 2,482 in 1995.[5]

With the exception of African-American female students, the percentage of high school students who smoke frequently increased 3% to 5% from 1991 to 1995 for all racial, ethnic, and gender groups.[6]

Profile of Smokers

In 1994, an estimated 48 million adults (25 million men and 22.7 million women) were current smokers in the US: 21% of adults smoked every day and 4.5% smoked on some days.[7]

- Smoking prevalence was higher for men (28%) than for women (23%), and was highest among American Indians/Alaska Natives (42%) compared with other racial and ethnic groups.
- Smoking prevalence was highest among men who have dropped out of school (46%).

For the more than 80% of adults who ever smoked, cigarette smoking was initiated by age 18, and more than half were already smoking regularly by that age.

The 1995 Youth Risk Behavior Survey (YRBS) data[6] show that:

- Nationwide, 71% of high school students have tried cigarette smoking.
- About one-third of high school students were current cigarette smokers, i.e., smoked at least one cigarette in the past 30 days.
- Sixteen percent of high school students were frequent smokers, an increase from 14% in the 1993 YRBS.
- White students (20%) were more likely than African-American (5%) or Hispanic (10%) students to smoke frequently.

Cost of Tobacco

Tobacco costs to our society are best measured by the number of people who die or suffer illness because of its use. Tobacco use also drains the US economy of more than $100 billion in health care costs and lost productivity.[8] Health care expenditures caused directly by smoking totaled $50 billion in 1993, according to the Centers for Disease Control and Prevention. Forty-three percent of these costs were paid by government funds, including Medicaid and Medicare. Tobacco costs Medicare more than $10 billion and Medicaid more than $5 billion per year.[8] Lost economic productivity caused by smoking cost the US economy $47.2 billion in 1990, according to the Office of Technology Assessment.[9] Adjusted for inflation, the total economic cost of smoking is more

than $100 billion per year. This does not include costs associated with diseases caused by environmental tobacco smoke, burn care resulting from cigarette smoking-related fires, or perinatal care for low-birthweight infants of mothers who smoke. Even though smokers die younger than the average American, over the course of their lives, current and former smokers generate an estimated $501 billion in excess health care costs.[10] On average, each cigarette pack sold costs Americans more than $3.90 in smoking-related expenses.[11]

Nicotine Addiction and Smoking Cessation

The 1988 *Surgeon General's Report on Nicotine Addiction* concluded that:

- Nicotine is the drug in tobacco that causes addiction.
- Cigarettes and other forms of tobacco are addicting.
- The pharmacologic and behavioral processes that determine tobacco addiction are similar to those that determine addiction to drugs such as heroin and cocaine.

Nicotine is found in substantial amounts in tobacco. It is absorbed readily from tobacco smoke in the lungs and from smokeless tobacco in the mouth or nose and is rapidly distributed throughout the body.

Tobacco companies are required by law to report nicotine levels in cigarettes to the Federal Trade Commission (FTC) but are not required to show the amount of nicotine on the cigarette brand labeling. The actual amount of nicotine available to the smoker in a given brand of cigarettes may be different from the level reported to the FTC.

In September 1990, the US Surgeon General outlined the benefits of smoking cessation:

- People who quit, regardless of age, live longer than people who continue to smoke.
- Smokers who quit before age 50 have half the risk of dying in the next 15 years compared with those who continue to smoke.
- Quitting smoking substantially decreases the risk of lung, laryngeal, esophageal, oral, pancreatic, bladder, and cervical cancers.
- Benefits of cessation include risk reduction for other major diseases including coronary heart disease and cardiovascular disease.

In 1994, an estimated 69% of current smokers reported that they wanted to quit smoking completely.[7] Quit attempts, abstaining from smoking for at least one day during the preceding 12 months, were made by about 46% of current every-day smokers. About one-quarter of US adults (26 million men and 20 million women) were former smokers in 1994.

Smokeless Tobacco

There has been a resurgence in the use of all forms of smokeless tobacco, plug, leaf, and snuff, but the greatest cause for concern centers on the increased use of "dipping snuff." In this practice, tobacco that has been processed into a coarse, moist powder is placed between the cheek and gum, and nicotine, along with a number of carcinogens, is absorbed through the oral tissue. Dipping snuff is highly addictive, and exposes the body to levels of nicotine equal to those of cigarettes.

In 1986, the US Surgeon General concluded that the use of smokeless tobacco "is not a safe substitute for smoking cigarettes. It can cause cancer and a number of non-cancerous oral conditions and can lead to nicotine addiction and dependence."[12]

- Oral cancer occurs several times more frequently among snuff dippers compared with non-tobacco users.
- The excess risk of cancer of the cheek and gum may reach nearly 50-fold among long-term snuff users.
- According to the US Department of Agriculture, US output of moist snuff has risen 83%, from about 30 million pounds in 1981 to an estimated 57 million pounds in 1996.[5]
- The Centers for Disease Control and Prevention's Youth Risk Behavior Survey reported that about 20% of male high school students used smokeless tobacco in 1995.[6]
- Among adults aged 18 and older in 1992-1993, 4.0% of men and 0.4% of women were current users of smokeless tobacco.
- Nationwide, about 7% of men aged 18 to 24 years reported smokeless tobacco use (snuff or chewing tobacco) in 1994.[13]

Youth and US Food and Drug Administration (FDA)

In August 1995, President Clinton proposed a comprehensive plan to reduce smoking among children and adolescents by 50% by reducing access and limiting the appeal of cigarettes to children. The historic proposal was prompted by recent data indicating that smoking among young people has increased since 1991, with the largest increase among the youngest smokers. The University of Michigan's 1995 Monitoring the Future Project indicates a 30% increase in smoking among 8th graders between 1991 and 1994.[14] Between 1970 and 1986, the use of snuff increased 15-fold and the use of chewing tobacco increased fourfold among male adolescents aged 17-19 years.

On August 23, 1996, President Clinton approved the FDA regulation which includes reducing easy access to tobacco by youth by:

- Setting a minimum age of 18 to purchase tobacco products and requiring age verification for all over-the-counter sales.
- Limiting vending machines and self-service displays to places where minors are not allowed.
- Prohibiting the sale of single cigarettes ("loosies") and packages of less than 20 cigarettes.
- Prohibiting the distribution of free cigarette samples.

The FDA regulation is designed to also reduce the appeal of tobacco products to children by:

- Banning outdoor advertising within 1,000 feet of schools and playgrounds and permitting black-and-white-text-only advertising for all other outdoor advertising accessible to kids.
- Allowing black-and-white-text-only advertising in publications with a large youth readership.
- Prohibiting the sale or giveaway of items popular with kids, like ball caps, jackets, and gym bags that carry cigarette or smokeless tobacco product brand names or logos.
- Prohibiting brand name sponsorship of sporting or entertainment events, but permiting sponsorship in the corporate name.
- Requiring tobacco companies with significant sales to children to educate young people about the dangers of tobacco.

The tobacco industry challenged the FDA's assertion of jurisdiction over nicotine-containing tobacco products in federal court in Greensboro, NC. On April 25, 1997, Judge William Osteen of the Federal District Court in Greensboro, NC, ruled that the FDA has jurisdiction under the federal Food, Drug, and Cosmetic Act to regulate nicotine-containing cigarettes and smokeless tobacco. However, the Court delayed implementation of the provisions that had not gone into effect as of April 1997, pending further action by the Court.

Cigars

Since 1993, consumption of large cigars and cigarillos increased 45% (total 4.4 billion cigars in 1996) to the highest level since the mid-eighties.[5] Use of premium cigars, which can cost more than $10 each, is up 250% since 1993.[15] The trend of increasing cigar use is predicted to continue. Cigar smoking has been publicized by celebrities, and some nightclubs and restaurants are promoting new cigar smoking sections. Many new cigar aficionados may not be aware that smoke from cigars contains the same deadly carcinogens as those from cigarettes. Congress did not explicitly include cigars in the 1984 law requiring health warnings on cigarettes, so cigar packages bear no warning from the US Surgeon General. The following health consequences of cigar smoking are presented in the 1989 Surgeon General's report.[16]

- Most of the same carcinogens and cancer-producing chemicals found in cigarettes are found in cigars.
- Overall cancer deaths among men who smoke cigars are 34% higher than among nonsmokers.
- Studies indicate that all tobacco users are 5 to 10 times more likely to get cancer of the mouth or throat than their nonsmoking counterparts.
- Cigar smokers have 4-10 times the risk of nonsmokers of dying from laryngeal, oral, or esophageal cancers.

Contents of Cigarettes

Cigarettes, cigars, and smokeless and pipe tobacco consist of dried tobacco leaves, as well as ingredients added for flavor and other properties. Tobacco companies have made public a list of additives used in all cigarettes, but consider the ingredients in specific brands as trade secrets. In 1996, Massachusetts passed a law requiring tobacco companies to disclose the contents of cigarettes to the state health department.

The effects of burning the additives used in cigarettes are not well understood. Substances that seem benign or even beneficial when eaten as food can have entirely different effects when burned and breathed as smoke.

Secondhand Smoke

In 1993, the US Environmental Protection Agency declared that secondhand smoke, also called environmental tobacco smoke (ETS), is a human carcinogen.[17] Each year, about 3,000 nonsmoking adults die of lung cancer as a result of breathing the smoke of others' cigarettes.

- ETS causes an estimated 35,000 to 40,000 deaths from heart disease in people who are not current smokers.
- Secondhand smoke causes other respiratory problems in nonsmokers: coughing, phlegm, chest discomfort, and reduced lung function.
- Each year, exposure to secondhand smoke causes 150,000 to 300,000 lower respiratory tract infections (such as pneumonia and bronchitis) in US infants and children younger than 18 months of age. These infections result in 7,500 to 15,000 hospitalizations every year.
- Children exposed to secondhand smoke at home are more likely to have middle-ear disease and reduced lung function.

• Secondhand smoke increases the number of asthma attacks and the severity of asthma in about 20% of this country's 2 to 5 million asthmatic children.

• Secondhand smoke contains over 4,000 chemical compounds, including carbon monoxide, formaldehyde, ammonia, nickel, zinc, acetone, cholesterol, hydrogen cyanide, and formic acid. Four chemicals in secondhand smoke (benzene, 2-naphthylamine, 4-aminobiphenyl, and polonium-210) are known human carcinogens, based on EPA standards. Ten other chemicals in secondhand smoke are classified by the EPA as probable human carcinogens.

Public policies to protect people from secondhand smoke and protect children from tobacco-caused disease and addiction can be enacted at the local, state, or federal levels. Because there are no safe levels of secondhand smoke, it is important that any such policies be as strong as possible and that they do not prevent action at other levels of government.

Cigarette Exports

US cigarette exports have increased due to aggressive marketing by tobacco companies and expanding foreign markets. An April 1997 report of the US Department of Agriculture[5] estimates:

• US cigarette exports for 1996 rose 5.5% to 244 billion pieces and exports of manufactured leaf increased 5% to 486 million pounds.

• US tobacco net exports have increased from about 2.1 billion in 1986 to 5.3 billion in 1996.

• US cigarette exports to Japan have increased about 942%, from 6.5 billion in 1985 to an estimated 67.7 billion in 1996.

• Exports to the countries that formerly comprised the Soviet Union have more than tripled from 4.6 billion in 1991 to an estimated 19.4 billion in 1996.

For more information about tobacco use and other risk factors for cancer, please inquire about the annual American Cancer Society publication *Cancer Risk Report* (8600.97).

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NUTRITION AND DIET

Existing scientific evidence suggests that about one-third of the cancer deaths that occur in the US each year is due to dietary factors. Another third is due to cigarette smoking. Therefore, for the majority of Americans who do not use tobacco, dietary choices and physical activity become the most important modifiable determinants of cancer risk. The evidence also indicates that although genetics are a factor in the development of cancer, heredity does not explain all cancer occurrences. Behavioral factors such as tobacco use, dietary choices, and physical activity modify the risk of cancer at all stages of its development. The introduction of healthful diet and exercise practices at any time from childhood to old age can promote health and likely reduce cancer risk.

Many dietary factors can affect cancer risk: types of foods, food preparation methods, portion sizes, food variety, and overall caloric balance. Cancer risk can be reduced by an overall dietary pattern that includes a high proportion of plant foods (fruits, vegetables, grains, and beans), limited amounts of meat, dairy, and other high-fat foods, and a balance of caloric intake and physical activity.

Based on its review of the scientific evidence, the American Cancer Society revised its nutrition guidelines in 1996 (the guidelines were last updated in 1991). The Society's recommendations are consistent in principle with the 1992 US Department of Agriculture (USDA) Food Guide Pyramid, the 1995 Dietary Guidelines for Americans, and dietary recommendations of other agencies for general health promotion and for the prevention of coronary heart disease, diabetes, and other diet-related chronic conditions. Although no diet can guarantee full protection against any disease, the Society believes that the following recommendations offer the best nutrition information currently available to help Americans reduce their risk of cancer.

Choose most of the foods you eat from plant sources.

Eat five or more servings of fruits and vegetables each day; eat other foods from plant sources, such as breads, cereals, grain products, rice, pasta, or beans several times each day. Many scientific studies show that eating fruits and vegetables (especially green and dark yellow vegetables and those in the cabbage family, soy products, and legumes) protect for cancers at many sites, particularly for cancers of the gastrointestinal and respiratory tracts. Grains are an important source of many vitamins and minerals such as folate, calcium, and selenium, all of which have been associated with a lower risk of colon cancer. Beans (legumes) are especially rich in nutrients that may protect against cancer.

Limit your intake of high-fat foods, particularly from animal sources.

Choose foods low in fat; limit consumption of meats, especially high-fat meats. High-fat diets have been associated with an increase in the risk of cancers of colon and rectum, prostate, and endometrium. The association between high-fat diets and the risk of breast cancer is much weaker. Whether these associations are due to the total amount of fat, the particular type of fat (saturated, monounsaturated, or polysaturated), the calories contributed by fat, or some other factor in food fats, has not yet been determined. Consumption of meat, especially red meat, has been associated with increased cancer risk at several sites, most notably colon and prostate.

Be physically active: achieve and maintain a healthy weight.

Physical activity can help protect against some cancers, either by balancing caloric intake with energy expenditure or by other mechanisms. An imbalance of caloric intake and energy output can lead to overweight, obesity, and increased risk for cancers at several sites: colon and rectum, prostate, endometrium, breast (among postmenopausal women), and kidney. Both physical activity and controlled caloric intake are necessary to achieve or to maintain a healthy body weight.

Limit consumption of alcoholic beverages, if you drink at all.

Alcoholic beverages, along with cigarette smoking and use of snuff and chewing tobacco, cause cancers of the oral cavity, esophagus, and larynx. The combined use of tobacco and alcohol leads to a greatly increased risk of oral and esophageal cancers; the effect of tobacco and alcohol combined is greater than the sum of their individual effects. Studies also have noted an association between alcohol consumption and an increased risk of breast cancer. The mechanism of this effect is not yet known, but the association may be due to carcinogenic actions of alcohol or its metabolites, to alcohol-induced changes in levels of hormones such as estrogens, or to some other process.

ENVIRONMENTAL CANCER RISKS

Environmental causes probably account for well over half of all cancer cases. Most environmental risks are determined by lifestyle choices (smoking, diet, etc.), while the rest arise in community and workplace settings. The degree of cancer hazard posed by these voluntary and involuntary risks depends on the concentration or intensity of the carcinogen and the exposure dose a person received. In situations where high levels of carcinogens are present and where exposures are extensive, significant hazards may exist, but where concentrations are low and exposures limited, hazards are often negligible. However, when low-dose exposures are widespread, they can represent significant public health hazards (for example, secondhand tobacco smoke). Strong regulatory control and constant attention to safe occupational practices are required to minimize the workplace potential for exposure to high-dose carcinogens.

Risk Assessment

Risks are assessed to protect people against unsafe exposures and to set appropriate environmental standards. The process of risk assessment has two steps. The first identifies the chemical or physical nature of a hazard and its cancer-producing potential, both in clinical and epidemiologic studies and in laboratory tests using animals or cell systems. Special attention is given to any evidence suggesting that cancer risk increases with increases in exposure. The second step measures levels of hazard in the environment (air, water, food, etc.) and the extent to which people are actually exposed (how much they eat of a particular food, use a particular water source, etc.). Knowledge of how the body absorbs chemicals or is exposed to radiation is essential for such dose measurements.

Unfortunately, evidence of risk for most potential carcinogens is usually the result of high-dose experiments on animals or observations where high-dose exposures have occurred in humans. To use such information to set human safety standards, scientists must extrapolate from animals to humans and from high-dose to low-dose conditions. Because both extrapolations involve much uncertainty, conservative assumptions are used so that risk assessment will err on the side of safety. For cancer safety standards, only increased risks of one case or less per million persons over a lifetime are usually acceptable.

Safety standards developed in this way for chemical or radiation exposures are the basis for federal regulatory activities at the Food and Drug Administration, the Environmental Protection Agency, and the Occupational Safety and Health Administration. The application of laws and procedures by which standards are implemented and risks are controlled is called risk management.

Chemicals

Various chemicals (for example, benzene, asbestos, vinyl chloride, arsenic, aflatoxin) show definite evidence of human carcinogenicity or are probable human carcinogens based on evidence from animal experiments (for example, chloroform, dichlorodiphenyltrichloroethane [DDT], formaldehyde, polychlorinated biphenyls [PCBs], polycyclic aromatic hydrocarbons). Often in the past, direct evidence of human carcinogenicity has come from studies of workplace conditions involving sustained, high-dose exposures. Occasionally, risks are greatly increased when particular exposures occur together (for example, asbestos exposure and cigarette smoking).

Radiation

Only high-frequency radiation, ionizing radiation (IR) and ultraviolet (UV) radiation, has been proven to cause human cancer. Exposure to sunlight (UV radiation) causes almost all cases of basal and squamous cell skin cancer and is a major cause of skin melanoma. Disruption of the earth's ozone layer by atmospheric chemical pollution (the "ozone hole") may lead to rising levels of UV radiation.

Evidence that high-dose IR (x-rays, radon, etc.) causes cancer comes from studies of atomic bomb survivors, patients receiving radiotherapy, and certain occupational groups (for example, uranium miners). Virtually any part of the body can be affected by IR, but especially bone marrow and the thyroid gland. Diagnostic medical and dental x-rays are set at the lowest dose levels possible to minimize risk without losing image quality. Radon exposures in homes can increase lung cancer risk, especially in cigarette smokers; remedial actions may be needed if radon levels are too high.

Unproven Risks

Public concern about environmental cancer risks often focuses on risks for which no carcinogenicity has been proven or on situations where known carcinogen exposures are at such low levels that risks are negligible. For example:

Pesticides. Many kinds of pesticides (insecticides, herbicides, etc.) are widely used in producing and marketing our food supply. Although high doses of some of these

chemicals cause cancer in experimental animals, the very low concentrations found in some foods are generally well within established safety levels. Environmental pollution by slowly degraded pesticides such as DDT, a result of past agricultural practices, can lead to food chain bioaccumulation and to persistent residues in body fat. Such residues have been suggested as a possible risk factor for breast cancer. Studies have shown that concentrations in tissue are low, however, and the evidence has not been conclusive.

Continued research regarding pesticide use is essential for maximum food safety, improved food production through alternative pest control methods, and reduced pollution of the environment. In the meantime, pesticides play a valuable role in sustaining our food supply. When properly controlled, the minimal risks they pose are greatly overshadowed by the health benefits of a diverse diet rich in foods from plant sources.

Non-ionizing radiation. Electromagnetic radiation at frequencies below ionizing and ultraviolet levels has not been shown to cause cancer. While some epidemiologic studies suggest associations with cancer, others do not, and experimental studies have not yielded reproducible evidence of carcinogenic mechanisms. Low-frequency radiation includes radiowaves, microwaves, and radar, as well as power frequency radiation arising from the electric and magnetic fields associated with electric currents (extremely low-frequency radiation).

Toxic wastes. Toxic wastes in dump sites can threaten human health through air, water, and soil pollution. Although many toxic chemicals contained in such wastes can be carcinogenic at high doses, most community exposures appear to involve very low or negligible dose levels. Clean-up of existing dump sites and close control of toxic materials in the future are essential to ensure healthy living conditions in our industrialized society.

Nuclear power plants. Ionizing radiation emissions from nuclear facilities are closely controlled and involve negligible levels of exposure for communities near such plants. Although reports about cancer case clusters in such communities have raised public concern, studies show that clusters do not occur more often near nuclear plants than they do by chance elsewhere in the population.

Summary of American Cancer Society Recommendations for the Early Detection of Cancer in Asymptomatic People

Site	Recommendation
Cancer-related Checkup	A cancer-related checkup is recommended every 3 years for people aged 20-40 and every year for people age 40 and older. This exam should include health counseling and depending on a person's age, might include examinations for cancers of the thyroid, oral cavity, skin, lymph nodes, testes, and ovaries, as well as for some nonmalignant diseases.
Breast	Women 40 and older should have an annual mammogram, an annual clinical breast exam (CBE) performed by a health care professional, and should perform monthly breast self-examination. The CBE should be conducted close to the scheduled mammogram. Women ages 20-39 should have a clinical breast exam performed by a health care professional every three years and should perform monthly breast self-examination.
Colon & Rectum	Men and women aged 50 or older should follow *one* of the examination schedules below: • A fecal occult blood test every year and a flexible sigmoidoscopy every five years.* • A colonoscopy every 10 years.* • A double-contrast barium enema every five to 10 years.* *A digital rectal exam should be done at the same time as sigmoidoscopy, colonoscopy, or double-contrast barium enema. People who are at moderate or high risk for colorectal cancer should talk with a doctor about a different testing schedule.
Prostate	The ACS recommends that both the prostate-specific antigen (PSA) blood test and the digital rectal examination be offered annually, beginning at age 50, to men who have a life expectancy of at least 10 years and to younger men who are at high risk. Men in high risk groups, such as those with a strong familial predisposition (e.g., two or more affected first-degree relatives), or African Americans may begin at a younger age (e.g., 45 years).
Uterus	**Cervix:** All women who are or have been sexually active or who are 18 and older should have an annual Pap test and pelvic examination. After three or more consecutive satisfactory examinations with normal findings, the Pap test may be performed less frequently. Discuss the matter with your physician. **Endometrium:** Women at high risk for cancer of the uterus should have a sample of endometrial tissue examined when menopause begins.

THE AMERICAN CANCER SOCIETY

In 1913, 10 physicians and 5 laymen founded the American Society for the Control of Cancer. Its stated purpose was to disseminate knowledge concerning the symptoms, treatment, and prevention of cancer; to investigate conditions under which cancer is found; and to compile statistics in regard thereto. Later renamed the American Cancer Society, Inc., the organization now consists of over 2 million volunteers working to conquer cancer.

Organization: The American Cancer Society, Inc., consists of a National Society with chartered Divisions throughout the country, and over 3,400 Units.

The National Society: A National Board of Directors provides basic representation from the Divisions and additional representation on the basis of population. The National Society is responsible for overall planning and coordination of public and professional education, providing technical help and materials to Divisions and Units, and administering programs of research, medical grants and clinical fellowships.

The Divisions: These are governed by volunteer members of Division Boards of Directors both medical and lay throughout the US and Puerto Rico.

The Units: Units are organized to cover the counties in the US. There are thousands of community leaders who direct the Society's programs at this level. Descriptions of some of the Society's major programs follow.

RESEARCH

The American Cancer Society is the largest source of private, not-for-profit cancer research funds in the US, second only to the federal government in total dollars spent. In fiscal year 1996, the Society invested over $93 million in research. To date, the Society has invested more than $2 billion in cancer research.The research program consists of three components: extramural grants, intramural epidemiology and surveillance research, and the intramural behavioral research center.

Extramural Grants

The extramural program supports investigator-initiated projects taking place in leading centers across the country, as well as training grants in selected health professions. Applications for grants are subjected to a rigorous external peer review which ensures that only the highest quality applications receive funding. The success of the Society's research program is exemplified by the fact that 28 Nobel Prize winners received grant support from the Society early in their careers.

Epidemiology and Surveillance Research

The Society supports an active program of epidemiologic and surveillance research. This department conducts descriptive epidemiologic studies and maintains surveillance of trends in cancer incidence, cancer mortality, cancer risk factors, and cancer patient care, and analyzes patterns of cancer causation in large prospective studies. Three such studies have been undertaken over the past 40 years:

- The Hammond-Horn study (188,000 men studied from 1952-1955).
- Cancer Prevention Study I (1 million people studied from 1959-1972 in 25 states).
- Cancer Prevention Study II (CPS II, a continuing study of 1.2 million people enrolled in 1982 by 77,000 volunteers in 50 states).

Each CPS II participant completed a questionnaire about lifestyle, illnesses, family history, and environmental exposures. In 1992-1993, further questionnaire data, with emphasis on diet, were obtained from 160,000 participants. Ongoing CPS II analyses relate patterns of cancer occurrence to questionnaire risk profiles.

Behavioral Research Center

The Center was established in 1995 to conduct original behavioral and psychosocial cancer research, provide consultation to other parts of the Society, and to facilitate the transfer of behavioral and psychosocial research and theory to improve cancer control policies. The ongoing research projects of the Center include:

- A nationwide, longitudinal study of 100,000 adult cancer survivors to determine the unmet psychosocial needs of survivors and their significant others, to identify factors that affect their quality of life, evaluate programs intended to meet their needs, and to examine late effects including second cancers.
- Study of risk perceptions and cigar smoking behaviors.
- Survey of behavioral, psychosocial, and policy researchers on cancer to obtain information regarding needs and areas of progress in these emergent areas of cancer research.
- Study of the use of complementary therapies by cancer patients.

• Testing risk communication models in changing health risk behaviors related to cancer prevention.

COMMUNITY CANCER CONTROL

Community Cancer Control refers to activities at the local, state, regional, or national level, which have a positive impact on the entire spectrum of prevention, early detection, effective treatment, survival, and quality of life related to cancer. Across the country, the Society seeks to fulfill its mission to save lives and diminish suffering from cancer through community-based programs aimed at reducing the risk of cancer, detecting cancer as early as possible, ensuring proper treatment, and empowering people facing cancer to cope with the disease and maintain the highest possible quality of life.

Prevention

Primary cancer prevention means taking the necessary precautions to prevent the occurrence of cancer in the first place. The Society's prevention programs focus primarily on tobacco control, the relationship between diet and physical activity and cancer (see dietary guidelines), promoting comprehensive school health education, and reducing the risk of skin cancer. Programs are designed to help adults and children make health-enhancing decisions and act on them.

The Society has joined other health, education, and social service agencies to promote comprehensive school health education and National School Health Education Standards. Comprehensive school health education is a planned health education curriculum for pre-school to Grade 12. The Standards describe for schools, parents, and communities how to create an instructional program that will enable students to become healthy and capable of academic success.

The Society's school health education programs emphasize the importance of developing good health habits and can be an integral part of a comprehensive school health education curriculum. Other prevention programs include Do It Yourself: Making Healthy Choices (Grades 4-6) and Changing the Course (Grades K-12). These curricula teach skills that enable elementary, intermediate, and secondary students to establish good dietary and physical activity habits that will reduce their risks of developing a number of diseases, including cancer.

Detection and Treatment

The Society also seeks, through the dissemination of its early detection guidelines and its detection education and advocacy programs, to ensure that all individuals have their cancer found at the earliest possible stage, when there is the greatest chance for successful treatment. The Society works in partnership with many public and private sector organizations in diverse settings to increase awareness about breast cancer and the importance of early detection, and to overcome the barriers to regular mammography use. On the basis of a comprehensive review of new evidence, American Cancer Society guidelines for the early detection of breast cancer were revised in 1997. The Society now recommends annual mammography for women beginning at age 40. (See complete American Cancer Society Guidelines, p. 31.)

The Society, in partnership with the Centers for Disease Control and Prevention, is leading a national initiative to increase colorectal cancer screening, now greatly underutilized. In 1997, the Society conducted a scientific review of guidelines for the early detection of colorectal cancer. (See p. 31.) A general consensus among health organizations based on new evidence of the benefits of colorectal cancer screening presents new opportunities for the promotion of early detection and for drastically reducing the toll in death and suffering from this disease.

In 1996, the board of directors approved prostate cancer as a priority focus for the Society. One result of this new focus has been the development of a national annual public awareness and education campaign, with a Father's Day focus, regarding prostate cancer.

The availability of genetic testing for inherited risk for cancer has raised a complex set of questions about the medical, psychosocial, ethical, legal, policy, and quality-of-life implications of genetic information. The Society is working with other national organizations to address these issues through advocacy and educational initiatives.

As the delivery of health care continues to change, the Society is working with partners in all sectors of the health care system to ensure that all individuals are offered a full range of preventive services to enable them to reduce their risk of getting cancer or to find their cancer at an early, treatable stage, and that persons with cancer receive the highest quality care.

Patient Services

Patient support is the range of emotional and practical help the Society offers for patients, their families, their caregivers, and their community from the time of diagnosis throughout life to life's end:

Transportation: Trained volunteer drivers get patients to and from treatment. This program is called *Road to Recovery* in some areas.

Reach to Recovery: A visitation program for women and their families who have a personal concern about breast cancer. Trained volunteers who have experienced breast cancer themselves provide information and support. An early support component of Reach to Recovery has been introduced to provide support to a woman who has a concern about breast cancer but who has not begun treatment. The woman may have found a lump, may have had a suspicious mammogram, or may have received a diagnosis of breast cancer. The first objective of the *Early Support* program is to provide visitors who are positive role models (women who have experienced breast cancer and survived—women who can provide support to other women). The second objective is to provide a caring listener with whom the woman can talk about her feelings and concerns. The third objective is to share sources of information with the woman and to make available easy-to-understand written material on breast cancer and related subjects.

"tlc,": A service offering of the Society, is a "magalog" designed to provide needed medical information and special products for women newly diagnosed with breast cancer and breast cancer survivors. The magalog features articles which focus on medical questions specific to breast cancer, and also has a Question & Answer section. *"tlc"* features a variety of hats, honeys, caps, turbans, hairpieces, swimwear, bras, prostheses, and breast forms. Many products are also appropriate for any woman experiencing treatment-related hair loss. Free copies are available by calling 1-800-850-9445.

Look Good...Feel Better: In partnership with the Cosmetic, Toiletry and Fragrance Association Foundation and the National Cosmetology Association, this free public service program is designed to teach women cancer patients beauty techniques to help restore their appearance and self-image during chemotherapy and radiation treatments.

Man to Man: This group program provides information about prostate cancer and related issues to men and their partners in a supportive atmosphere. Some areas offer *Side by Side,* a group program for the partners of men with prostate cancer, and/or a visitation program in which a trained prostate cancer survivor provides support to a man newly diagnosed with prostate cancer. Additionally, *Man to Man News* is a free quarterly newsletter for prostate cancer survivors and their families, and there is a Man to Man subsite on the Society's homepage.

Children's Camps: In some areas, the Society sponsors camps for children who have, or have had, cancer. These camps are equipped to handle the special needs of children undergoing treatment.

Hope Lodge: Housing is provided in some areas through funds raised specifically to purchase a dwelling to house patients during their treatment; 12 lodges are in operation and five are under construction.

I Can Cope: This patient and family cancer education program consists of a series of classes, often held at a local hospital. Doctors, nurses, social workers, and community representatives provide information about cancer diagnosis and treatment, as well as assistance in coping with the physical and emotional challenges of a cancer diagnosis.

ADVOCACY & PUBLIC POLICY

Cancer is a political, as well as a medical, social, psychological, and economic issue. Policy-makers at all levels of government make decisions every day which impact the lives of more than 8 million cancer survivors, their families, and all potential cancer patients.

To positively impact those decisions, the Society has identified Advocacy as one of its top corporate priorities.

In concert with its cancer research, prevention, and control initiatives, the Society's advocacy initiative strives to influence public policies at all levels, with special emphasis on laws or regulations relating to:

- The use, sale, distribution, marketing, and advertising of tobacco products, particularly to youth.
- Improved access for all Americans—particularly poor and underserved Americans—to a range of health care services for the prevention, early detection, diagnosis, and treatment of cancer and care of cancer patients.
- Increased federal funding and incentives for private sponsorship of cancer research to prevent and cure this disease.
- Support dissemination of information and access to cancer prevention and health promotion services.
- Advocacy for the rights of cancer survivors.

American Cancer Society advocacy efforts are successful because they rely on the combined voices of a community-based grassroots advocacy network of Society volunteers, health care professionals, and cancer survivors and other partners who have successfully influenced or supported laws and regulations to:

- Enforce the US Food and Drug Administration' s role in regulating tobacco products as "drug delivery devices."
- Enact health insurance market reforms to ensure portability and continuity of health insurance coverage for individuals with a history of cancer or other serious illness.

• Improve third-party coverage for cancer prevention and treatment clinical trials, including payment for patient care costs.

• Increase federal funding for our National Cancer Program.

The Poor and Underserved

Despite recent progress in the fight against cancer, some Americans continue to bear a disproportionate share of the nation's cancer burden. They include the racially and culturally diverse Americans who share characteristics associated with lower levels of income and educational attainment, as well as families with inadequate medical insurance and individuals who experience barriers because of differing cultural beliefs and practices or limited literacy or language abilities.

The excess cancer mortality in poor and underserved populations is the result of a complex array of social forces and individual behaviors. Eliminating the problem requires a comprehensive approach to cancer control with nonprofit organizations, government, and businesses working in collaboration to address the financial and economic barriers that limit access to health care services, as well as the cognitive, attitudinal, and behavioral dimension of the problem. Also, biomedical, epidemiological, and behavioral research is needed to improve our understanding of the unique impact of cancer on minority groups and socioeconomically disadvantaged populations.

For a period approaching two decades, the Society has engaged in a major initiative to understand and address the needs of the populations at high risk. As part of this initiative, the Society has convened conferences, held hearings, sponsored research, issued reports, funded demonstration projects, conducted health education and outreach, and advocated for changes in public policy.

The Society's major strategies for addressing the needs of underserved Americans include:

• Providing local leadership in cancer prevention and control in communities nationwide through collaboration with community-based organizations that are addressing priority interests of the poor and the underserved (such as health, education, spirituality, recreation and safety).

• Conducting and supporting medical and behavioral research to discover effective practices for cancer prevention, early detection, and treatments among high-risk populations.

• Advocating for public policy changes at all levels of government to address inequities and inadequacies in health care delivery and financing.

The following are a few of the Society's efforts that are currently ongoing.

• Conducting a series of nine regional conferences to facilitate collaboration among government agencies and community-based organizations in state- and community-level planning and programming for cancer control in underserved populations.

• Providing technical assistance and resources to organizations whose constituencies include low-income Americans to strengthen their capacity to address the cancer-related needs of these populations in concert with the Society.

• Promoting a national dialogue within communities of color about the impact of prostate cancer to raise public awareness and identify critical action steps to control prostate cancer in high-risk populations.

• As managed care becomes the mechanism by which most Americans receive health care, providing assistance to the underserved in navigating new health care systems.

• Monitoring the impact of managed care on the health of socioeconomically disadvantaged populations and on their access to cancer prevention, early detection, and treatment.

SOURCES OF STATISTICS

Cancer Deaths. The estimated numbers of US cancer deaths are calculated by fitting the numbers of cancer deaths for 1979 through 1994 to a statistical model which forecasts the numbers of deaths that are expected to occur in 1998. The estimated numbers of cancer deaths for each state are calculated similarly, using state level data. For both the US and state estimates, data on the numbers of deaths are obtained from the National Center for Health Statistics (NCHS) at the Centers for Disease Control and Prevention.

We discourage the use of our estimates to track year-to-year changes in cancer deaths because the numbers can vary considerably from year to year, particularly for less common cancers and for smaller states. Mortality rates reported by NCHS are generally more informative statistics to use when tracking cancer mortality trends.

Mortality Rates. Mortality rates or death rates are defined as the number of people per 100,000 dying of a disease during a given year. In this publication, mortality rates are based on counts of cancer deaths compiled by NCHS and population data collected by the US Bureau of the Census.

New Cancer Cases. The estimated numbers of new US cancer cases are calculated by estimating the numbers of cancer cases that occurred each year for 1979 through 1994 and fitting these estimates to a statistical model which forecasts the numbers of cases that are expected to occur in 1998. Estimates of the numbers of cancer cases for 1979 through 1994 are used rather than actual case counts because case data are not available for all 50 states. The estimated numbers of cases for 1979 through 1994 are calculated using cancer incidence rates from the regions of the United States included in the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) program and population data collected by the US Bureau of the Census.

State case estimates cannot be calculated using the same modeling strategy that we use to calculate state death estimates. Instead, estimates are calculated using cancer deaths forecast for each state for 1998 and US estimates of new cancer cases and cancer deaths for 1998. Estimates for Puerto Rico are based on 1990–1991 data from the Central Cancer Registry of Puerto Rico.

Like the method used to calculate cancer deaths, the methods used to estimate new US and state cases for the upcoming year can produce numbers that vary considerably from year to year, particularly for less common cancers and for smaller states. For this reason, we discourage the use of our estimates to track year-to-year changes in cancer occurrence. Incidence rates reported by SEER are generally more informative statistics to use when tracking cancer incidence trends for the total United States, and rates from state cancer registries are useful for tracking local trends.

Incidence Rates. Incidence rates are defined as the number of people per 100,000 who develop disease during a given time period. For this publication, incidence rates were calculated using data on cancer cases collected by the SEER program and population data collected by the US Bureau of the Census.

Survival. Five-year relative survival rates are presented in this report for cancer patients diagnosed between 1986 and 1993 and followed through 1994. To adjust for normal life expectancy (factors such as dying of heart disease, accidents, and diseases of old age), these rates are calculated by dividing 5-year survival rates for cancer patients by 5-year survival rates for people in the general population who are similar to the patient group with respect to age, gender, race, and calendar year of observation. All survival statistics presented in this publication were originally published in the SEER Cancer Statistics Review, 1973-1994.

Five-year relative survival rates have several limitations. While they provide some indication about the average survival experience of cancer patients in the United States, they are less useful in predicting survival for individual cancer patients. Although the rates presented are based on the most recent information available, they include data from patients whose treatment was state-of-the art at least 8 years ago and therefore may not reflect the most recent treatment advances.

Probability of Developing Cancer. Probabilities of developing cancer are calculated using statistical modeling techniques developed by the National Cancer Institute's Applied Research Branch. These probabilities reflect the average experience of people in the United States and do not take into account individual behaviors and risk factors. For example, the estimated 1 in 18 women likely to develop lung cancer is a low estimate for smokers and a high estimate for nonsmokers.

Cancer Around the World. Mortality rates for Cancer Around the World were based on data compiled by the World Health Organization. This table includes countries with a population of 500,000 or more, death registration of at least 82%, and a proportion of deaths with a medically certified cause of death of at least 95%.

Additional Information. More information on the methods used to generate the statistics for this report can be found in the following publications:

A. For information on data collection methods used by the National Center for Health Statistics: National Center for Health Statistics. *Vital Statistics of the United States, 1994, Vol II, Mortality, Part A.* Washington: Public Health Service. 1997.

B. For information on data collection methods used by the National Cancer Institute's Surveillance, Epidemiology and End Results Program: Ries LAG, Kosary CL, Hankey BF, et al (eds.). *SEER Cancer Statistic Review, 1973-1994:* Tables and Graphs. National Cancer Institute. NIH Publication No. 96-2789. Bethesda, MD, 1997.

C. For information on the methods used to estimate the numbers of new cancer cases and deaths: Parker S, Tong T, Bolden S, Wingo PA. Cancer statistics 1996. *CA* 1996; 46:5-27.

D. For information on the methods used to calculate the probability of developing cancer: Feuer EJ, Wun L-M, Boring CC et al. The lifetime risk of developing breast cancer. *JNCI* 1993; 85:892-897.

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