



# CANCER FACTS & FIGURES 2001



Estimated number of new cancer cases by state for 2001.

Estimated total number for the US: 1,268,000, excluding basal and squamous cell skin cancers and in situ carcinomas except urinary bladder.

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.



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\*Indicates a figure or table

# 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. 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. Cancer is treated by surgery, radiation, chemotherapy, hormones, and immunotherapy.

## Can Cancer Be Prevented?

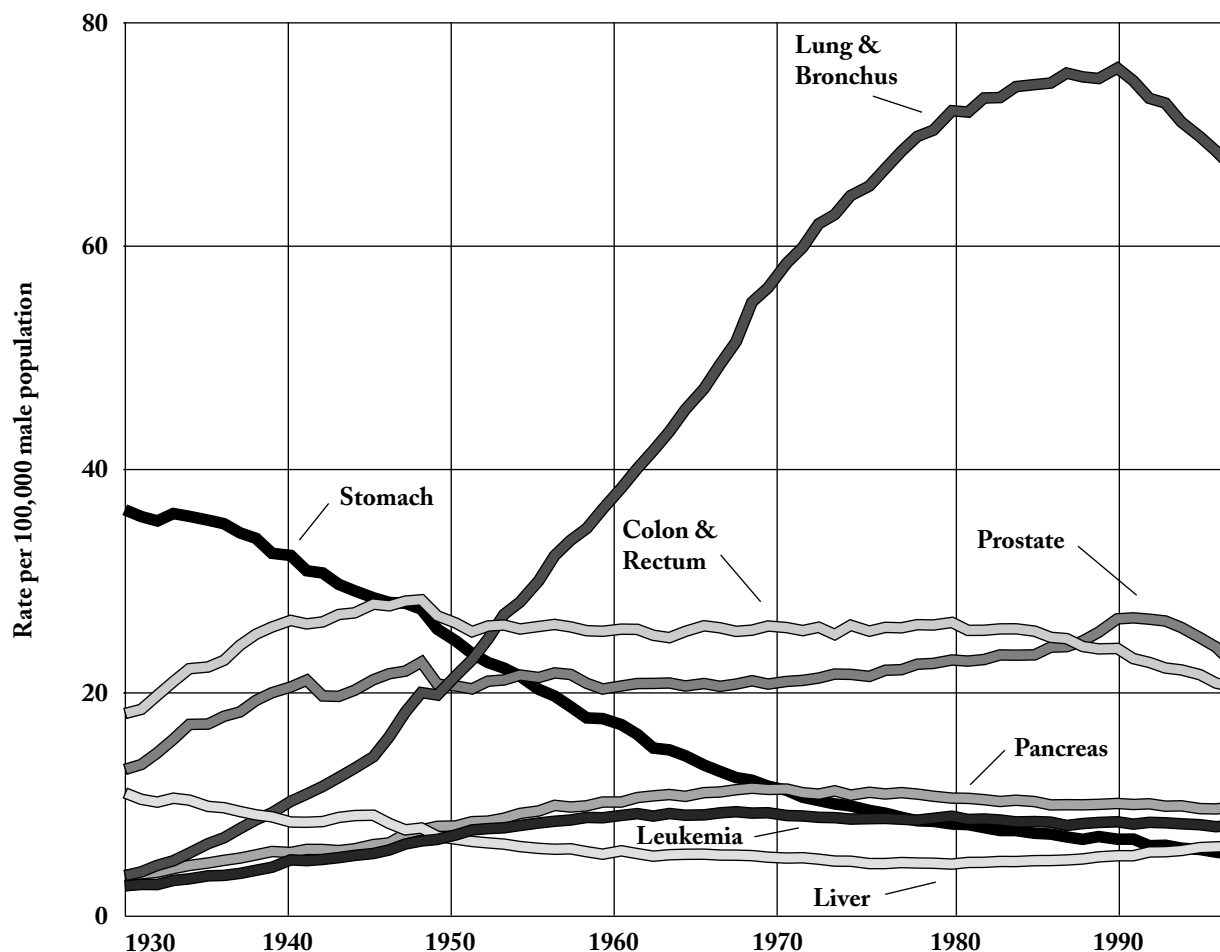
All cancers caused by cigarette smoking and heavy use of alcohol could be prevented completely. The ACS estimates that in 2001 about 172,000 cancer deaths are

expected to be caused by tobacco use, and about 19,000 cancer deaths may be related to excessive alcohol use, frequently in combination with tobacco use.

Scientific evidence suggests that about one-third of the 553,400 cancer deaths expected to occur in 2001 will be related to nutrition, physical activity, and other lifestyle factors and could also be prevented. Certain cancers are related to viral infections—e.g., hepatitis B virus (HBV), human papillomavirus (HPV), human immunodeficiency virus (HIV), human T-cell leukemia/lymphoma virus-I (HTLV-I), and others—and could be prevented through behavioral changes or vaccines. In addition, many of the more than 1 million skin cancers that are expected to be diagnosed in 2001 could have been prevented by protection from the sun's rays.

Regular screening examinations by a health care

Age-Adjusted Cancer Death Rates,\* for Males by Site, US, 1930–1997



\*Per 100,000, 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 & bronchus, and colon & rectum are affected by these coding changes.

Source: US Mortality Public Use Data Tapes 1960–1997, US Mortality Volumes 1930–1959, National Center for Health Statistics, Centers for Disease Control and Prevention, 2000.

American Cancer Society, Surveillance Research, 2001

professional can result in the detection of cancers of the breast, colon, rectum, cervix, prostate, testis, oral cavity, 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 screening-accessible cancers listed above account for about half of all new cancer cases. The 5-year relative survival rate for these cancers is about 81%. If all of these cancers were diagnosed at a localized stage through regular cancer screenings, this rate would increase to 95%.

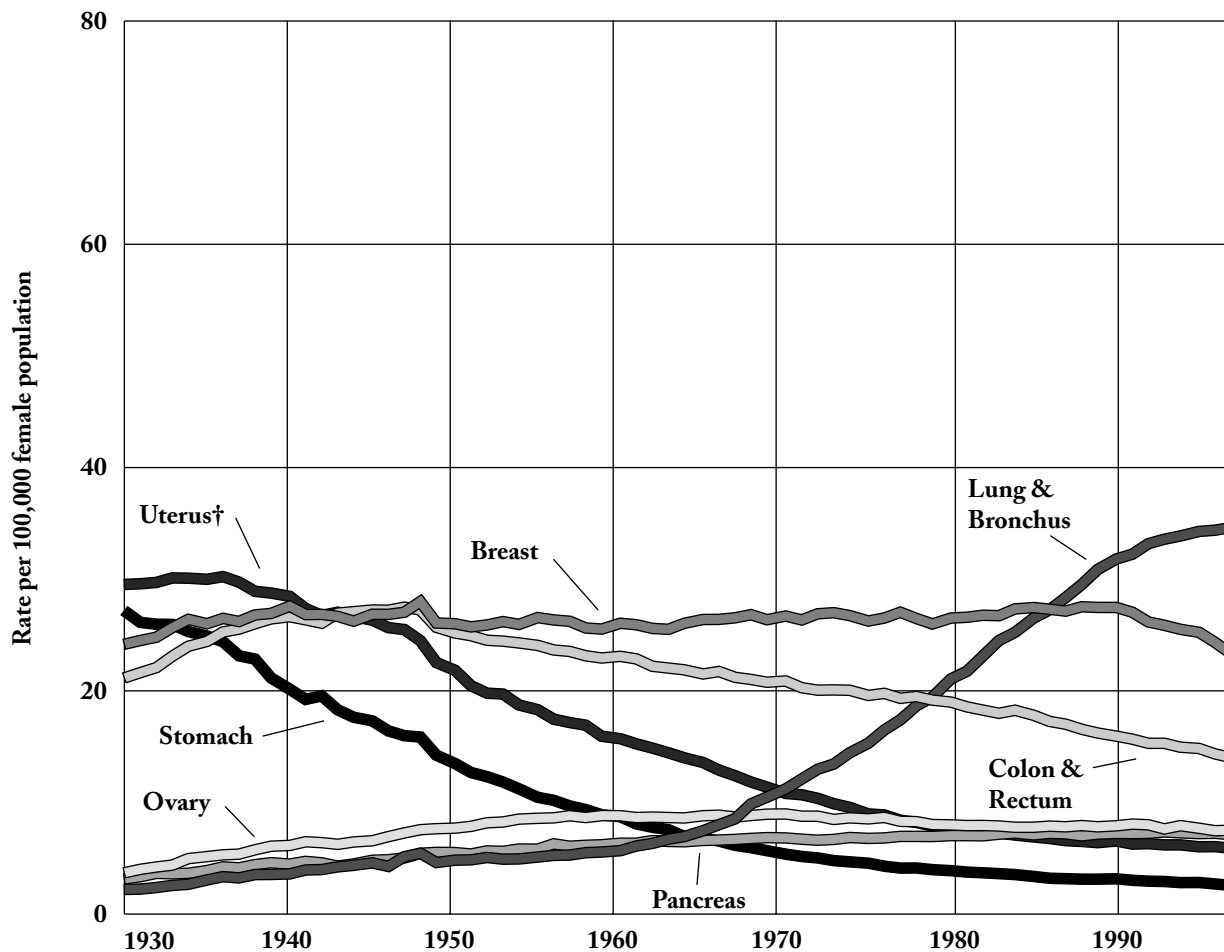
### Who Is at Risk of Developing Cancer?

Anyone. Since the occurrence of cancer increases as individuals age, most cases affect adults beginning in middle-age. Nearly 80% of all cancers are diagnosed at ages 55 and 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 about

a 1 in 2 lifetime risk of developing cancer, and for women the risk is about 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, male smokers have a 20-fold relative risk of developing lung cancer compared with nonsmokers. This means that they are about 20 times more likely to develop lung cancer 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 2-fold 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.

Age-Adjusted Cancer Death Rates,\* for Females by Site, US, 1930–1997



\*Per 100,000, age-adjusted to the 1970 US standard population. †Uterus cancer death rates are for uterine cervix and uterine corpus combined. **Note:** Due to changes in ICD coding, numerator information has changed over time. Rates for cancers of the uterus, ovary, lung & bronchus, and colon & rectum are affected by these coding changes.

Source: US Mortality Public Use Data Tapes 1960–1997, US Mortality Volumes 1930–1959, National Center for Health Statistics, Centers for Disease Control and Prevention, 2000.

American Cancer Society, Surveillance Research, 2001

All cancers involve the malfunction of genes that control cell growth and division. About 5% to 10% of cancers are clearly hereditary, in that an inherited faulty gene predisposes the person to a very high risk of particular cancers. The remainder of cancers are not hereditary, but result from damage to genes (mutations) that occurs throughout our lifetime, either due to internal factors, such as hormones or the digestion of nutrients within cells, or external factors, such as chemicals and sunlight.

### **How Many People Alive Today Have Ever Had Cancer?**

The National Cancer Institute estimates that approximately 8.9 million Americans with a history of cancer were alive in 1997. Some of these individuals were considered cured, while others still had evidence of cancer and may have been undergoing treatment.

### **How Many New Cases Are Expected to Occur This Year?**

About 1,268,000 new cancer cases are expected to be diagnosed in 2001. Since 1990, nearly 15 million new cancer cases have been diagnosed. These estimates do not include carcinoma in situ (noninvasive cancer) of any site except urinary bladder, and do not include basal and squamous cell skin cancers. More than 1 million cases of basal and squamous cell skin cancers are expected to be diagnosed this year.

### **How Many People Are Expected to Die of Cancer This Year?**

This year about 553,400 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. In the US, 1 of every 4 deaths is from cancer.

### **What Percentage of People Survive Cancer?**

The 5-year relative survival rate for all cancers combined is 60%. After adjusting for normal life expectancy (factors such as dying of heart disease, accidents, and diseases of old age), the 5-year relative survival rate represents persons who are living five years after diagnosis, whether disease-free, in remission, or under treatment with evidence of cancer. While 5-year relative survival rates are useful in monitoring progress in the early detection and treatment of cancer, they do not represent the proportion of people who are cured permanently since cancer can affect survival beyond five years after diagnosis.

Although 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 and should be interpreted with caution. First, 5-year relative survival rates are based on patients who were diagnosed and treated at least eight years ago and do not reflect recent advances in treatment. Second, information about detection methods, treatment protocols, additional illnesses, and behaviors that influence survival are not taken into account in the estimation of survival rates. (For more information about survival rates, see Sources of Statistics on page 41.)

### **How is Cancer Staged?**

Staging is the process of describing the extent of the disease or the spread of cancer from the site of origin. Staging is essential in determining the choice of therapy and assessing prognosis. A cancer's stage is based on information about the primary tumor's size and location in the body and whether or not it has spread to other areas of the body. A number of different staging systems are currently being used to classify tumors. The TNM staging system assesses tumors in three ways: extent of the primary tumor (T), absence or presence of regional lymph node involvement (N), and absence or presence of distant metastases (M). Once the T, N, and M are determined, a "stage" of I, II, III, or IV is assigned, with stage I being early stage and IV being advanced stage. Summary staging (in situ, local, regional, and distant) has been useful for descriptive and statistical analysis of tumor registry data. If cancer cells are present only in the layer of cells where they developed and they have not spread to other parts of that organ or elsewhere in the body, then the stage is in situ. If cancer cells have spread beyond the original layer of tissue, then the cancer is considered invasive. Please see Five-Year Relative Survival Rates\* by Stage at Diagnosis, 1989-1996, page 16, for a description of the other summary stage categories.

### **What Are the Costs of Cancer?**

The National Institutes of Health estimate overall costs for cancer in the year 2000 at \$180.2 billion: \$60 billion for direct medical costs (total of all health expenditures); \$15 billion for indirect morbidity costs (cost of lost productivity due to illness); and, \$105.2 billion for indirect mortality costs (cost of lost productivity due to premature death). Insurance status and barriers to health care may affect the cost of treating cancer in this country. According to 1997 data, about 17% of Americans under age 65 have no health insurance, and about 21% of older persons have only Medicare coverage. During 1997 and 1998, almost 18% of Americans age 18 to 64 years reported not having a regular source of health care. Also, 10% of American adults reported cost as a barrier to obtaining needed health care in the previous year.

## Estimated New Cancer Cases\* and Deaths by Sex for All Sites, US, 2001

	Estimated New Cases			Estimated Deaths		
	Both Sexes	Male	Female	Both Sexes	Male	Female
All Sites	1,268,000	643,000	625,000	553,400	286,100	267,300
Oral cavity & pharynx	30,100	20,200	9,900	7,800	5,100	2,700
Tongue	7,100	4,800	2,300	1,700	1,100	600
Mouth	10,500	6,000	4,500	2,300	1,300	1,000
Pharynx	8,400	6,300	2,100	2,100	1,500	600
Other oral cavity	4,100	3,100	1,000	1,700	1,200	500
Digestive system	235,700	124,000	111,700	131,300	70,100	61,200
Esophagus	13,200	9,900	3,300	12,500	9,500	3,000
Stomach	21,700	13,400	8,300	12,800	7,400	5,400
Small intestine	5,300	2,600	2,700	1,100	600	500
Colon	98,200	46,200	52,000	48,100	23,000	25,100
Rectum	37,200	21,100	16,100	8,600	4,700	3,900
Anus, anal canal, & anorectum	3,500	1,500	2,000	500	200	300
Liver & intrahepatic bile duct	16,200	10,700	5,500	14,100	8,900	5,200
Gallbladder & other biliary	6,900	3,200	3,700	3,300	1,200	2,100
Pancreas	29,200	14,200	15,000	28,900	14,100	14,800
Other digestive organs	4,300	1,200	3,100	1,400	500	900
Respiratory system	184,600	102,400	82,200	162,500	93,900	68,600
Larynx	10,000	8,000	2,000	4,000	3,100	900
Lung & bronchus	169,500	90,700	78,800	157,400	90,100	67,300
Other respiratory organs	5,100	3,700	1,400	1,100	700	400
Bones & joints	2,900	1,600	1,300	1,400	800	600
Soft tissue (including heart)	8,700	4,600	4,100	4,400	2,100	2,300
Skin (excluding basal & squamous)	56,400	31,700	24,700	9,800	6,300	3,500
Melanoma-skin	51,400	29,000	22,400	7,800	5,000	2,800
Other non-epithelial skin	5,000	2,700	2,300	2,000	1,300	700
Breast	193,700	1,500	192,200	40,600	400	40,200
Genital system	286,800	206,500	80,300	58,500	32,200	26,300
Uterine cervix	12,900	—	12,900	4,400	—	4,400
Uterine corpus	38,300	—	38,300	6,600	—	6,600
Ovary	23,400	—	23,400	13,900	—	13,900
Vulva	3,600	—	3,600	800	—	800
Vagina & other genital, female	2,100	—	2,100	600	—	600
Prostate	198,100	198,100	—	31,500	31,500	—
Testis	7,200	7,200	—	400	400	—
Penis & other genital, male	1,200	1,200	—	300	300	—
Urinary system	87,500	59,400	28,100	25,000	16,100	8,900
Urinary bladder	54,300	39,200	15,100	12,400	8,300	4,100
Kidney & renal pelvis	30,800	18,700	12,100	12,100	7,500	4,600
Ureter & other urinary organs	2,400	1,500	900	500	300	200
Eye & orbit	2,100	1,100	1,000	200	100	100
Brain & other nervous system	17,200	9,800	7,400	13,100	7,200	5,900
Endocrine system	21,400	5,600	15,800	2,300	1,000	1,300
Thyroid	19,500	4,600	14,900	1,300	500	800
Other endocrine	1,900	1,000	900	1,000	500	500
Lymphoma	63,600	35,000	28,600	27,600	14,500	13,100
Hodgkin's disease	7,400	3,900	3,500	1,300	700	600
Non-Hodgkin's lymphoma	56,200	31,100	25,100	26,300	13,800	12,500
Multiple myeloma	14,400	7,500	6,900	11,200	5,800	5,400
Leukemia	31,500	17,700	13,800	21,500	12,000	9,500
Acute lymphocytic leukemia	3,500	2,100	1,400	1,400	800	600
Chronic lymphocytic leukemia	8,100	4,600	3,500	4,600	2,700	1,900
Acute myeloid leukemia	10,000	5,200	4,800	7,200	3,900	3,300
Chronic myeloid leukemia	4,700	2,800	1,900	2,300	1,300	1,000
Other leukemia	5,200	3,000	2,200	6,000	3,300	2,700
Other & unspecified primary sites	31,400	14,400	17,000	36,200	18,500	17,700

\*Rounded to the nearest 100. Excludes basal and squamous cell skin cancers and in situ carcinomas except urinary bladder. Carcinoma in situ of the breast accounts for about 46,400 new cases annually, and melanoma in situ accounts for about 31,400 new cases annually. Estimates of new cases are based on incidence rates from the NCI SEER program 1979-1997.

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## Estimated New Cancer Cases by Site and State, US, 2001\*

State	All Sites	Female Breast	Uterine Cervix	Colon & Rectum	Uterine Corpus	Leukemia	Lung & Bronchus	Melanoma	Non-Hodgkin's Lymphoma	Prostate	Urinary Bladder
Alabama	22,600	2,900	200	2,000	500	500	3,100	900	800	4,100	800
Alaska	1,600	200	†	100	†	†	200	100	100	200	100
Arizona	21,300	3,200	200	2,200	500	500	2,800	1,100	1,000	3,600	900
Arkansas	14,100	1,900	200	1,300	400	400	2,200	500	600	2,400	500
California	117,400	18,800	1,400	11,700	3,400	3,000	14,200	5,300	5,300	17,500	5,300
Colorado	14,300	2,100	100	1,500	400	400	1,600	800	700	2,100	600
Connecticut	16,000	2,500	100	1,600	500	400	2,000	700	800	2,500	800
Delaware	4,000	600	100	400	100	100	600	200	200	600	300
District of Columbia	2,800	600	†	300	200	†	300	†	100	500	100
Florida	91,600	12,500	900	9,400	2,600	2,300	12,900	3,800	4,200	15,000	4,400
Georgia	31,100	5,000	400	2,900	1,000	700	4,400	1,200	1,100	4,900	1,100
Hawaii	4,700	600	†	500	100	100	600	100	300	700	100
Idaho	5,000	800	†	500	100	100	600	300	200	900	300
Illinois	56,800	9,100	600	6,200	1,800	1,500	7,400	2,100	2,500	9,000	2,400
Indiana	29,300	4,400	300	3,200	900	700	4,200	1,100	1,300	4,400	1,200
Iowa	14,800	2,300	100	1,900	600	500	1,900	500	700	2,500	700
Kansas	12,100	1,700	100	1,200	300	300	1,600	600	500	2,000	500
Kentucky	21,100	2,900	200	2,200	500	500	3,400	900	900	2,800	700
Louisiana	21,700	3,300	300	2,400	500	500	2,900	700	900	3,500	800
Maine	6,900	1,000	100	700	200	100	1,000	300	300	900	400
Maryland	23,500	4,000	300	2,700	600	500	3,200	800	900	3,700	1,000
Massachusetts	31,300	4,600	300	3,600	800	700	4,000	1,400	1,400	4,600	1,600
Michigan	45,300	6,800	400	4,900	1,500	1,100	6,200	1,600	2,200	7,100	2,000
Minnesota	20,600	3,200	100	2,100	600	600	2,400	800	1,200	3,600	900
Mississippi	13,900	2,000	200	1,300	200	300	2,000	500	500	2,500	400
Missouri	28,400	3,800	300	3,100	900	700	4,300	1,200	1,200	4,000	1,100
Montana	4,300	600	†	400	100	100	600	200	200	800	200
Nebraska	7,500	1,200	100	1,000	200	200	900	300	300	1,200	300
Nevada	9,200	1,200	100	1,000	200	200	1,300	400	400	1,300	400
New Hampshire	5,800	800	†	600	200	100	800	200	300	800	300
New Jersey	41,200	6,700	400	4,500	1,600	1,100	5,000	1,800	2,000	6,200	2,000
New Mexico	6,900	1,100	100	700	200	200	800	300	300	1,300	200
New York	83,200	14,200	900	9,700	3,400	2,000	10,000	2,800	3,700	12,700	4,200
North Carolina	37,300	5,500	400	4,000	1,200	900	5,400	1,400	1,400	6,000	1,300
North Dakota	3,100	500	†	300	†	100	400	100	100	500	100
Ohio	58,200	8,900	600	6,400	2,000	1,400	8,100	2,100	2,700	8,700	2,500
Oklahoma	16,600	2,500	200	1,800	300	400	2,600	800	700	2,200	600
Oregon	16,700	2,400	100	1,600	500	400	2,300	800	800	3,000	700
Pennsylvania	68,400	10,300	600	8,000	2,200	1,700	8,900	2,700	3,000	10,900	3,200
Rhode Island	5,600	800	100	600	100	100	800	200	300	800	200
South Carolina	18,800	2,800	200	2,000	500	500	2,600	600	700	3,200	700
South Dakota	3,600	500	†	400	100	100	400	200	200	600	100
Tennessee	28,800	4,200	300	2,900	700	700	4,300	1,400	1,200	3,900	800
Texas	78,900	12,300	1,000	8,700	2,300	2,000	11,000	3,400	3,600	12,500	2,900
Utah	5,600	1,000	†	700	200	200	400	400	300	1,400	300
Vermont	2,900	400	†	400	100	100	400	200	100	300	100
Virginia	30,500	4,600	300	3,200	1,000	700	4,200	1,300	1,200	4,900	1,100
Washington	24,800	3,600	200	2,400	700	700	3,300	1,200	1,100	3,400	1,100
West Virginia	10,900	1,500	100	1,100	300	300	1,700	400	500	1,400	500
Wisconsin	25,000	3,600	200	2,600	700	700	3,000	1,100	1,300	4,300	1,100
Wyoming	2,200	300	†	300	100	100	300	100	100	400	100
United States	1,268,000	192,200	12,900	135,400	38,300	31,500	169,500	51,400	56,200	198,100	54,300

\*Rounded to the nearest 100. Excludes basal and squamous cell skin cancers and in situ carcinomas except urinary bladder. †Estimate is 50 or fewer cases. Note: These estimates are offered as a rough guide and should be interpreted with caution. They are calculated according to the distribution of estimated cancer deaths in 2001 by state. State estimates may not add to US total due to rounding.

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## Estimated Cancer Deaths by Site and State, US, 2001\*

State	All Sites	Brain/ Nervous System	Female Breast	Colon & Rectum	Leukemia	Liver	Lung & Bronchus	Non- Hodgkin's Lymphoma	Ovary	Pancreas	Prostate
Alabama	9,900	200	600	800	400	300	2,900	400	300	500	600
Alaska	700	†	100	100	†	†	200	†	†	†	†
Arizona	9,300	200	700	900	300	200	2,600	500	200	500	600
Arkansas	6,100	200	400	600	200	200	2,000	300	200	300	400
California	51,200	1,500	3,900	4,900	2,100	1,800	13,200	2,500	1,400	2,800	2,800
Colorado	6,200	200	400	600	300	100	1,500	300	200	400	300
Connecticut	7,000	100	500	700	300	200	1,900	400	200	400	400
Delaware	1,800	†	100	200	100	†	500	100	†	100	100
District of Columbia	1,200	†	100	100	†	†	300	†	†	100	100
Florida	40,000	1,000	2,600	4,000	1,500	1,000	12,000	2,000	1,000	2,100	2,400
Georgia	13,600	300	1,000	1,200	500	300	4,100	500	300	600	800
Hawaii	2,000	†	100	200	100	100	600	100	†	100	100
Idaho	2,200	100	200	200	100	†	600	100	100	100	100
Illinois	24,800	500	1,900	2,600	1,000	700	6,900	1,200	600	1,300	1,400
Indiana	12,800	300	900	1,400	500	300	3,900	600	300	600	700
Iowa	6,500	200	500	800	300	100	1,800	300	200	300	400
Kansas	5,300	100	400	500	200	100	1,500	200	100	300	300
Kentucky	9,200	200	600	900	300	200	3,200	400	200	400	400
Louisiana	9,500	200	700	1,000	300	300	2,700	400	200	500	600
Maine	3,000	100	200	300	100	100	900	200	100	200	100
Maryland	10,300	200	800	1,100	400	200	3,000	400	300	600	600
Massachusetts	13,700	300	1,000	1,500	500	300	3,700	700	300	700	700
Michigan	19,800	500	1,400	2,100	700	500	5,700	1,000	500	1,100	1,100
Minnesota	9,000	200	700	900	400	200	2,300	500	200	500	600
Mississippi	6,100	200	400	600	200	200	1,900	200	100	300	400
Missouri	12,400	300	800	1,300	500	300	4,000	600	300	600	600
Montana	1,900	†	100	200	100	†	500	100	100	100	100
Nebraska	3,300	100	200	400	200	100	900	200	100	200	200
Nevada	4,000	100	200	400	100	100	1,200	200	100	200	200
New Hampshire	2,500	100	200	300	100	100	700	100	100	100	100
New Jersey	18,000	300	1,400	1,900	800	500	4,600	900	500	1,000	1,000
New Mexico	3,000	100	200	300	100	100	700	100	100	200	200
New York	36,300	800	3,000	4,100	1,400	1,000	9,300	1,700	900	2,200	2,000
North Carolina	16,300	400	1,100	1,700	600	300	5,000	700	400	800	900
North Dakota	1,300	100	100	100	100	†	300	100	†	100	100
Ohio	25,400	600	1,900	2,700	1,000	500	7,500	1,300	600	1,300	1,400
Oklahoma	7,300	100	500	700	300	200	2,400	300	200	300	300
Oregon	7,300	200	500	700	300	100	2,100	400	200	400	500
Pennsylvania	29,800	600	2,200	3,300	1,100	700	8,200	1,400	700	1,500	1,700
Rhode Island	2,400	100	200	300	100	100	700	100	100	100	100
South Carolina	8,200	200	600	800	300	200	2,400	300	200	500	500
South Dakota	1,600	†	100	200	100	†	400	100	†	100	100
Tennessee	12,600	300	900	1,200	500	300	4,000	600	300	600	600
Texas	34,400	900	2,600	3,600	1,400	1,200	10,200	1,700	800	1,700	2,000
Utah	2,500	100	200	300	100	100	400	200	100	100	200
Vermont	1,200	†	100	200	†	†	400	100	†	100	100
Virginia	13,300	300	1,000	1,400	500	300	3,900	600	300	700	800
Washington	10,800	300	800	1,000	400	300	3,100	500	300	600	500
West Virginia	4,800	100	300	500	200	100	1,500	200	100	200	200
Wisconsin	10,900	300	700	1,100	500	200	2,800	600	300	600	700
Wyoming	1,000	†	100	100	†	†	200	†	†	†	100
United States	553,400	13,100	40,200	56,700	21,500	14,100	157,400	26,300	13,900	28,900	31,500

\*Rounded to the nearest 100. Excludes in situ carcinomas except urinary bladder. †Estimate is 50 or fewer deaths.

Note: State estimates may not add to US total due to rounding.

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## Cancer Incidence Rates by Site and State, US, 1993-1997\*

State	All Sites		Breast	Colon & Rectum		Lung & Bronchus		Non-Hodgkin's Lymphoma		Prostate	Urinary Bladder	
	Male	Female	Female	Male	Female	Male	Female	Male	Female	Male	Male	Female
Alabama	373.6	266.5	87.0	42.2	29.9	89.8	35.1	14.1	9.4	86.7	22.9	4.9
Alaska	415.7	356.6	110.8	47.4	36.8	75.9	50.8	18.4	10.9	116.2	29.9	9.5
Arizona†	397.4	305.1	100.7	43.9	31.2	66.1	39.8	15.4	11.1	115.9	29.0	7.8
Arkansas‡	—	—	—	—	—	—	—	—	—	—	—	—
California†	449.8	340.8	109.6	48.4	34.2	67.5	43.4	19.3	11.9	136.4	27.3	6.9
Colorado†	431.0	323.0	107.4	44.2	32.1	58.6	34.7	17.3	12.3	140.8	27.6	7.6
Connecticut†	496.6	374.5	119.3	58.2	40.8	75.4	47.7	20.4	14.0	144.6	35.6	10.0
Delaware†	520.0	379.3	118.2	57.9	40.7	100.4	57.9	18.3	13.0	157.4	30.9	8.8
District of Columbia	625.7	363.0	117.5	57.0	40.9	102.5	45.1	20.6	11.8	226.6	21.3	6.1
Florida†	476.1	351.2	105.9	57.0	40.4	87.0	50.5	18.2	11.7	128.2	30.9	8.3
Georgia	372.3	260.6	83.8	37.3	26.6	74.3	33.9	13.2	8.8	109.1	20.2	5.1
Hawaii†	398.9	310.8	103.5	55.2	35.2	60.0	30.1	15.8	10.9	105.3	17.6	4.7
Idaho†	422.9	317.2	102.5	44.1	31.5	61.5	35.5	16.9	13.3	133.8	29.7	6.7
Illinois†	467.0	347.5	108.1	55.6	40.0	85.4	45.3	17.6	12.5	130.7	29.5	8.0
Indiana	403.9	319.3	101.0	51.4	36.6	84.3	43.5	16.2	12.2	97.7	27.2	7.4
Iowa†	465.5	342.3	106.1	58.5	42.6	82.2	39.4	18.2	13.8	134.0	29.7	6.6
Kansas‡	—	—	—	—	—	—	—	—	—	—	—	—
Kentucky†	482.0	344.8	99.0	54.3	39.4	121.5	56.8	17.2	12.5	113.4	28.3	7.0
Louisiana†	500.3	320.5	97.1	54.6	38.5	104.0	45.3	17.3	12.1	146.0	25.9	6.7
Maine	461.5	347.6	105.7	54.2	39.7	86.9	49.4	16.1	13.0	121.6	36.1	9.1
Maryland	530.9	372.2	119.2	58.3	42.2	91.8	51.6	17.5	11.8	172.0	30.9	9.1
Massachusetts	488.4	361.4	117.9	59.3	40.3	76.8	46.6	18.6	12.8	145.0	35.3	10.1
Michigan	514.0	357.6	109.4	53.8	37.6	90.8	48.7	18.2	13.3	164.2	32.3	8.6
Minnesota†	453.5	336.5	111.3	51.0	36.9	62.8	37.0	20.6	14.1	149.5	29.3	7.5
Mississippi	411.4	279.4	88.3	45.3	35.0	86.1	36.7	14.6	10.4	121.1	21.8	4.0
Missouri‡	—	—	—	—	—	—	—	—	—	—	—	—
Montana†	417.5	319.2	108.1	46.1	34.3	68.4	42.9	16.8	11.4	137.6	28.9	7.1
Nebraska†	449.9	328.8	106.7	55.8	38.0	73.5	36.0	17.9	12.4	141.1	26.4	6.8
Nevada	352.5	295.1	84.6	43.0	30.7	78.7	56.0	12.2	8.5	77.5	26.9	6.7
New Hampshire†	468.1	359.0	113.9	56.7	41.5	76.5	47.9	16.0	12.0	132.9	38.6	9.6
New Jersey†	512.5	371.9	114.9	62.9	43.4	79.1	45.6	20.1	14.1	157.4	34.8	9.3
New Mexico†	392.3	293.1	95.9	39.7	28.2	51.7	30.7	14.0	9.8	129.3	20.7	6.1
New York	448.0	341.4	101.7	54.5	39.2	73.8	42.6	19.4	12.3	121.9	29.8	8.7
North Carolina†	432.9	301.5	99.2	45.9	32.8	93.8	40.3	14.4	10.5	123.3	24.4	6.1
North Dakota	447.2	306.6	103.7	55.7	36.4	60.9	34.2	18.5	11.1	142.3	32.1	6.9
Ohio	419.8	329.0	104.6	52.1	37.1	79.3	44.3	16.9	12.1	110.2	29.0	7.9
Oklahoma‡	—	—	—	—	—	—	—	—	—	—	—	—
Oregon	429.0	352.3	118.2	44.8	32.4	73.1	49.6	16.8	12.5	123.2	31.5	8.3
Pennsylvania	490.9	350.5	108.0	60.7	42.4	83.7	42.2	18.7	13.0	143.4	35.0	9.2
Rhode Island†	523.5	382.6	113.2	62.2	44.6	92.6	50.7	20.7	15.1	145.6	39.8	10.7
South Carolina	476.2	319.7	102.2	50.5	34.9	86.8	41.8	15.6	10.9	152.5	25.0	5.2
South Dakota‡	—	—	—	—	—	—	—	—	—	—	—	—
Tennessee	441.6	343.1	110.2	50.8	36.8	110.5	49.3	16.7	12.0	99.8	24.8	6.7
Texas	440.1	312.5	96.4	47.9	32.6	88.1	43.0	17.2	11.9	121.0	23.0	5.6
Utah†	390.3	278.0	94.8	37.8	27.8	35.9	18.2	17.7	11.8	151.9	22.6	5.4
Vermont‡	—	—	—	—	—	—	—	—	—	—	—	—
Virginia	393.6	285.2	94.3	44.7	33.2	75.4	37.1	13.8	9.5	117.6	22.4	6.5
Washington	456.7	365.0	117.2	47.8	35.5	72.8	49.4	20.3	13.5	132.8	31.2	7.9
West Virginia†	446.1	337.6	94.5	51.7	40.4	102.2	52.7	15.5	12.1	109.4	29.9	8.5
Wisconsin†	477.8	349.1	108.6	58.9	41.6	75.5	41.5	19.1	13.4	144.1	31.5	8.5
Wyoming	418.3	309.7	96.6	41.7	32.8	59.1	40.4	13.6	12.4	153.0	26.5	7.2
United States	475.5	347.8	111.9	52.4	37.2	73.7	43.0	19.8	12.7	147.0	28.7	7.6

\*Per 100,000, age-adjusted to the 1970 US standard population. Not all states submitted data for all years. †This state's registry has been recognized by the North American Association of Central Cancer Registries (NAACCR) to meet the following data quality standards: data for all years 1993-1997; a NAACCR estimate of 0.1% duplicate records or fewer; resolution of errors detected using an EDITS software program; and a NAACCR estimate of at least 90% completeness. ‡This state's registry did not submit incidence data to NAACCR for 1993-1997.

Sources: State Incidence—Cancer in North America 1993-1997, North American Association of Central Cancer Registries, 2000.

US Incidence—SEER Cancer Statistics Review, 1973-1997, Surveillance Epidemiology, and End Results Program, Division of Cancer Control and Population Sciences, National Cancer Institute, 2000.

American Cancer Society, Surveillance Research, 2001

## Cancer Death Rates by Site and State, US, 1993-1997\*

State	All Sites		Breast	Colon & Rectum		Lung & Bronchus		Non-Hodgkin's Lymphoma		Pancreas		Prostate
	Male	Female	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
Alabama	238.2	138.3	22.6	18.2	12.7	84.7	31.4	8.0	5.1	10.5	7.3	28.6
Alaska	192.0	139.0	22.0	20.2	15.2	65.9	38.7	5.8	4.4	10.0	6.8	18.0
Arizona	186.0	127.3	22.1	17.6	12.2	59.2	31.7	8.0	5.4	9.1	6.6	22.3
Arkansas	236.1	139.6	23.0	20.4	13.7	94.6	35.8	8.9	5.5	10.1	7.7	25.8
California	183.4	134.8	24.0	18.0	12.7	54.7	33.4	7.9	5.2	9.2	7.1	22.0
Colorado	172.0	120.2	21.1	17.2	12.2	48.2	25.6	7.8	5.5	9.1	6.8	22.5
Connecticut	195.7	138.9	25.4	20.7	13.7	58.0	33.6	8.3	6.1	10.3	7.7	21.8
Delaware	239.5	158.7	26.9	22.8	16.0	81.0	42.8	8.8	5.5	10.4	7.6	27.9
District of Columbia	278.5	162.9	32.5	24.1	17.1	79.1	34.7	8.3	3.8	12.5	9.1	43.0
Florida	203.1	135.6	23.9	19.5	13.4	69.4	36.0	8.5	5.2	9.6	6.9	22.4
Georgia	232.0	136.6	24.0	18.9	13.3	85.2	32.3	7.3	4.7	9.7	7.1	30.3
Hawaii	158.7	104.4	16.6	16.7	11.0	45.2	22.4	7.0	4.7	9.3	6.8	15.8
Idaho	178.8	122.0	22.3	17.0	11.4	51.2	27.8	8.6	5.5	8.5	5.6	24.9
Illinois	218.5	145.9	26.7	23.3	15.6	71.7	34.5	8.8	5.8	10.2	7.3	25.0
Indiana	221.9	145.4	25.1	22.3	15.7	80.2	37.0	8.6	5.8	10.6	7.0	25.0
Iowa	196.2	131.2	23.4	22.1	15.8	66.2	30.4	8.8	6.2	9.0	6.3	23.4
Kansas	196.6	131.4	22.8	20.0	13.4	66.1	31.4	8.6	5.8	9.7	7.1	22.8
Kentucky	247.8	152.0	24.3	23.5	15.9	100.7	43.8	8.5	5.9	10.3	6.8	25.0
Louisiana	252.2	151.2	26.1	22.8	15.4	90.5	36.8	8.8	5.6	12.1	8.3	29.9
Maine	229.6	152.9	24.7	22.9	16.7	77.0	40.9	8.9	6.3	10.2	7.6	25.1
Maryland	226.4	151.7	26.8	24.0	16.3	73.6	38.1	7.9	5.2	10.0	7.8	28.0
Massachusetts	215.1	148.1	27.0	23.7	15.9	64.6	36.7	8.9	6.0	10.1	7.5	23.6
Michigan	210.8	142.7	25.4	21.5	14.2	70.6	35.5	8.5	6.2	9.7	7.4	25.3
Minnesota	188.7	130.9	23.7	19.0	12.6	54.0	29.4	9.4	6.6	9.7	7.1	25.2
Mississippi	245.8	138.6	23.6	20.2	13.7	90.5	32.6	7.5	4.9	11.0	7.7	31.1
Missouri	218.7	142.8	24.2	21.8	15.0	79.8	37.5	8.5	5.6	9.2	7.3	23.1
Montana	190.5	132.4	23.2	19.8	12.7	56.1	32.8	8.4	5.9	9.7	6.9	26.4
Nebraska	192.6	125.3	23.6	23.3	14.2	62.6	27.8	8.1	5.1	9.3	6.3	20.9
Nevada	212.1	153.7	23.6	21.0	13.7	69.0	46.0	8.0	5.4	9.9	7.5	24.1
New Hampshire	216.2	155.4	26.7	21.6	17.3	68.6	39.3	9.6	6.1	9.8	7.7	23.4
New Jersey	215.5	152.3	27.8	24.8	16.5	64.5	34.9	8.9	6.0	10.1	8.2	25.3
New Mexico	176.6	122.1	21.9	17.4	11.7	46.4	26.1	7.1	4.8	8.6	6.7	24.3
New York	203.6	143.4	27.4	23.3	15.8	61.1	32.0	9.2	5.6	10.4	7.8	23.9
North Carolina	229.5	136.0	24.5	20.3	14.2	84.9	31.8	7.7	5.0	9.9	7.2	29.1
North Dakota	189.0	124.6	22.6	22.4	13.8	54.8	25.6	7.4	6.2	8.7	6.3	27.1
Ohio	222.8	148.1	26.3	23.5	15.7	76.9	36.9	9.2	6.2	9.5	7.4	25.3
Oklahoma	214.6	138.0	24.2	19.4	13.6	82.7	36.1	8.7	5.6	9.3	6.5	22.5
Oregon	195.5	141.7	23.4	18.3	12.9	63.8	39.4	8.6	5.7	9.0	7.7	24.6
Pennsylvania	218.4	145.8	27.0	23.9	16.2	70.1	32.8	8.9	6.0	9.7	7.2	25.0
Rhode Island	221.0	148.8	26.2	24.3	15.5	74.7	37.9	9.8	6.0	10.4	7.4	23.7
South Carolina	233.8	137.1	24.2	21.4	14.1	81.7	31.0	7.4	4.8	9.9	8.2	31.6
South Dakota	194.1	121.4	21.5	20.9	14.3	61.3	24.9	9.0	5.5	8.6	6.2	26.2
Tennessee	238.6	142.6	24.8	21.2	14.7	93.5	35.5	8.8	5.6	10.3	7.2	25.7
Texas	212.8	133.9	22.9	20.1	13.0	73.0	33.2	8.5	5.5	9.7	6.9	25.1
Utah	143.6	102.2	20.4	14.1	10.8	29.8	13.8	7.9	5.5	7.1	5.0	25.4
Vermont	208.4	144.8	23.9	21.4	16.2	64.6	36.0	10.4	5.5	9.3	5.9	26.8
Virginia	225.1	141.9	25.5	20.8	14.8	77.4	34.7	8.0	5.4	9.9	6.9	28.4
Washington	190.9	138.8	23.6	18.1	12.9	61.1	37.3	8.1	5.5	9.2	7.4	22.7
West Virginia	231.2	151.1	23.0	21.8	15.9	87.0	42.3	8.5	5.7	8.8	6.6	23.6
Wisconsin	197.9	134.2	23.8	20.6	13.6	57.3	29.3	9.0	5.8	9.6	7.1	25.8
Wyoming	185.1	136.1	23.8	18.1	15.2	55.1	32.1	6.3	6.1	8.8	6.4	28.0
United States	209.7	139.8	24.8	21.0	14.4	69.4	34.0	8.5	5.6	9.7	7.2	24.7

\*Per 100,000, age-adjusted to the 1970 US standard population.

Sources: State Mortality—Cancer in North America 1993-1997, North American Association of Central Cancer Registries, 2000. US Mortality—SEER Cancer Statistics Review, 1973-1997, Surveillance Epidemiology, and End Results Program, Division of Cancer Control and Population Sciences, National Cancer Institute, 2000.

Mortality from both sources derived from data originating from the National Centers for Health Statistics, Centers for Disease Control and Prevention, 2000.

American Cancer Society, Surveillance Research, 2001

# SELECTED CANCERS

## BREAST

**New Cases:** An estimated 192,200 new invasive cases of breast cancer are expected to occur among women in the United States during 2001. After increasing about 4% per year in the 1980s, breast cancer incidence rates may be continuing to increase slightly in white women. About 1,500 new cases of breast cancer are expected to be diagnosed in men in 2001.

In addition to invasive breast cancer, 46,400 new cases of in situ breast cancer are expected to occur among women during 2001. Of these, approximately 88% will be ductal carcinoma in situ (DCIS). DCIS is removed to prevent progression to invasive disease. The increase in detection of DCIS cases is a direct result of increased use of mammography screening, which is also responsible for detection of invasive cancers, at a less advanced stage than might have occurred otherwise.

**Deaths:** An estimated 40,600 deaths (40,200 women, 400 men) from breast cancer in 2001. Breast cancer ranks second among cancer deaths in women. According to the most recent data, mortality rates declined significantly during 1990-1997 with the largest decreases in younger women—both white and black. These decreases are probably the result of both earlier detection and improved treatment.

**Signs and Symptoms:** The earliest sign of breast cancer is 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, ulceration, or retraction. Breast pain is commonly due to benign conditions and is not usually 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, a long menstrual history (menstrual periods that started early and ended late in life), obesity after menopause, or recent use of oral contraceptives or postmenopausal estrogens and progestins; who have never had children or had their first child after age 30, or who consume alcoholic beverages. Worldwide, breast cancer incidence rates appear to correlate with variations in diet, especially fat intake, although the specific dietary factors that affect breast cancer have not been firmly established. Additional factors that may be related to

increased breast cancer risk and that are currently being studied include breast density and physical inactivity. Most data indicate tamoxifen decreases breast cancer risk and preliminary data suggests another selective estrogen-receptor modulator, raloxifene, does also. Research about BRCA1 and BRCA2 susceptibility genes for breast cancer is ongoing, although, general screening of the population for mutations of these genes is not recommended.

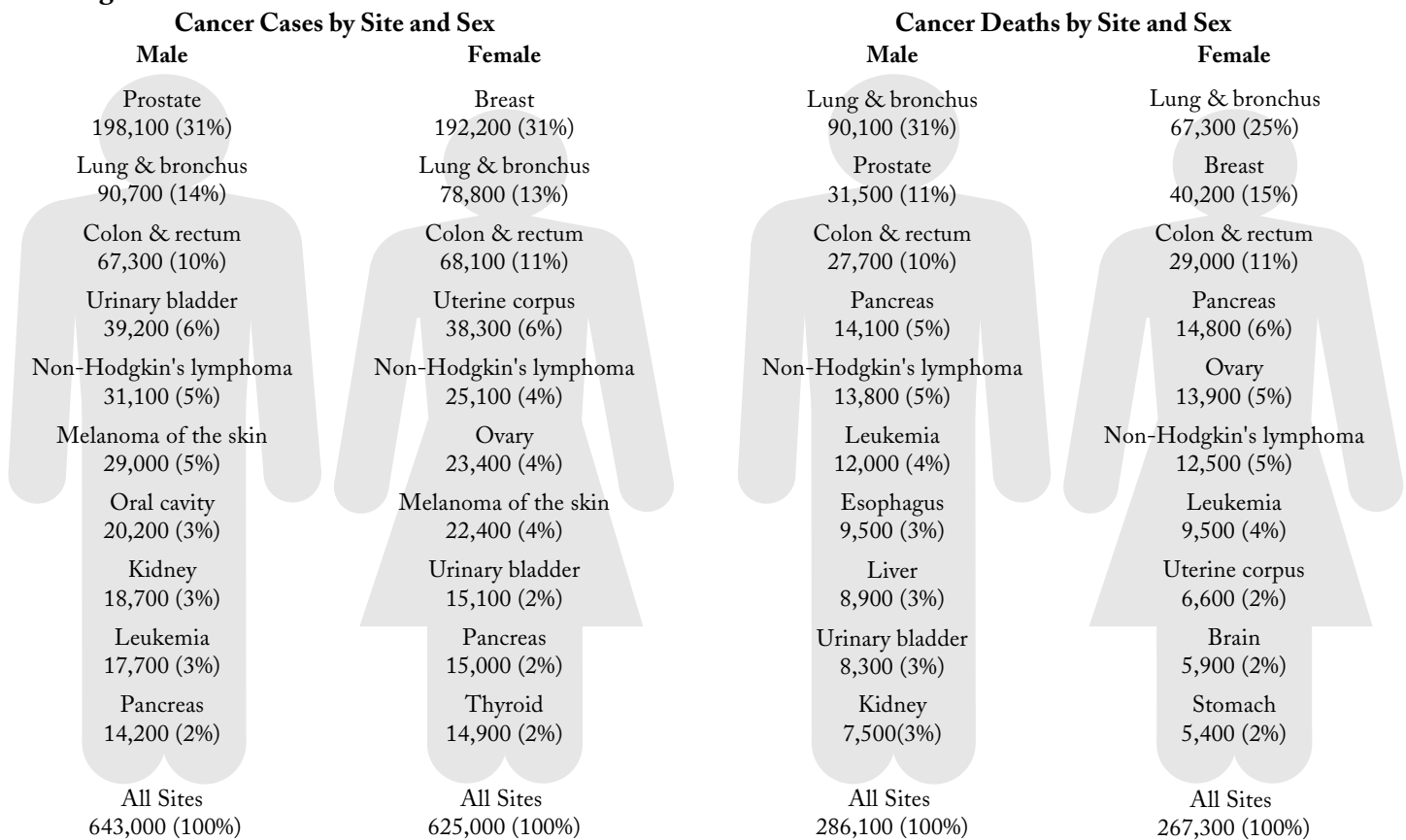
**Early Detection:** Mammography is especially valuable as an early detection tool because it can identify breast abnormalities that may be cancer at an early stage before physical symptoms develop. Numerous studies have shown that early detection saves lives and increases treatment options. The declines in breast cancer mortality have been attributed, in large part, to the use of regular screening mammography. The American Cancer Society recommends that women age 40 and older have an annual mammogram, an annual clinical breast examination by a health care professional (close to and preferably before the scheduled mammogram), and perform monthly breast self-examination. Women ages 20-39 should have a clinical breast examination by a health care professional every three years and should perform monthly breast self-examination.

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 circumstances 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 immediately after mastectomy.

Treatment of ductal carcinoma in situ (DCIS) includes local excision, radiation, and/or tamoxifen. Treatment of

## Leading Sites of New Cancer Cases\* and Deaths—2001 Estimates



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

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DCIS is important to prevent tumor progression.

**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 77%, and for women with distant metastases the rate is 21%. Survival after a diagnosis of breast cancer continues to decline beyond five years. Survival at 10 years or more is also stage dependent, with the best survival observed in women diagnosed with early stage disease.

For more information about breast cancer, please inquire about the American Cancer Society publication *Breast Cancer Facts & Figures* (8610.99).

## CHILDHOOD CANCER

**New Cases:** An estimated 8,600 new cases are expected to occur among children aged 0-14 in 2001; childhood cancers are rare.

**Deaths:** An estimated 1,500 deaths are expected to occur among children aged 0-14 in 2001, about one-third of them from leukemia. Despite its rarity, cancer is the chief cause of death by disease in children between ages 1 and 14. Mortality rates have declined 50% since 1973.

**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. Childhood cancers include:

- Leukemia which accounts for about 31.5% of cases in children ages 0-14 (see Leukemia).
- Osteosarcoma (2.4%), 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 (1.7%), another type of cancer that arises in bone.
- Neuroblastoma (7.5%), a sympathetic nervous system cancer which can appear anywhere but usually appears in the abdomen as a swelling.
- Rhabdomyosarcoma (3.4%), the most common soft tissue sarcoma, can occur in the head and neck area, genitourinary area, trunk, and extremities.

## How to Estimate Cancer Statistics Locally, 2001

To obtain the estimated number of...	Multiply community population by:				
	All Sites	Female Breast*	Colon & Rectum	Lung	Prostate*
New cancer cases	0.0045	0.0014	0.0005	0.0006	0.0015
Cancer deaths	0.0020	0.0003	0.0002	0.0006	0.0002
People who will eventually develop cancer	0.4071	0.1283	0.0565	0.0687	0.1589
People who will eventually die of cancer	0.2162	0.0334	0.0241	0.0561	0.0343

\*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. State cancer registries 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.

**Source:** DEVCAN Software, Version 4.0, Surveillance, Epidemiology, and End Results Program, 1973–1997, Division of Cancer Control and Population Sciences, National Cancer Institute, 2000.

American Cancer Society, Surveillance Research, 2001

- Brain and intraspinal cancers (20.2%) which 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 (4.0%) and Hodgkin's disease (4.4%), 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 (3.1%), an eye cancer, usually occurs in children under age 4. When detected early, cure is possible with appropriate treatment.
- Wilms' tumor (6.1%), 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, 75%; bone cancer, 69%; neuroblastoma, 70%; brain and central nervous system, 65%; Wilms' tumor (kidney), 93%; Hodgkin's disease, 94%; and acute lymphocytic leukemia, 82%.

## COLON AND RECTUM

**New Cases:** An estimated 135,400 cases in 2001, including 98,200 of colon cancer and 37,200 of rectal cancer. Colorectal cancers are the third most common cancers in men and women. Incidence rates declined -1.6% per year during 1985-1997. Research suggests that these declines may be due to increased screening and polyp removal, preventing progression of polyps to invasive cancers.

**Deaths:** An estimated 56,700 deaths (48,100 from colon cancer, 8,600 from rectal cancer) in 2001, accounting for

about 10% of cancer deaths. Mortality rates for colorectal cancer have also declined for men and women over the past 20 years. This decrease reflects the decreasing trend in incidence rates and improvements in survival rates.

**Signs and Symptoms:** Rectal bleeding, pain, 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 has been associated with increased colorectal cancer risk. Other possible risk factors include smoking, physical inactivity, high-fat and/or low-fiber diet, alcohol consumption, as well as low intake of fruits and vegetables. Recent studies have suggested that estrogen replacement therapy and nonsteroidal anti-inflammatory drugs such as aspirin may reduce colorectal cancer risk.

**Early Detection:** Beginning at age 50, adults at average risk should have one of the following: 1) fecal occult blood test (FOBT) every year, or 2) flexible sigmoidoscopy every 5 years, or 3) FOBT every year and flexible sigmoidoscopy every 5 years, (of these 3 options, the American Cancer Society prefers option 3, annual FOBT and flexible sigmoidoscopy every 5 years) or 4) double-contrast barium enema every 5 years, or 5) colonoscopy every 10 years. A digital rectal exam should be done at the same time as sigmoidoscopy, colonoscopy, or double-contrast barium enema. These options are acceptable choices for screening in average risk adults since each of the tests has inherent characteristics related to accuracy, prevention potential, costs, and risks. Individuals should have an opportunity to make an informed decision about their choices for screening.

People at increased or high risk (e.g., 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) should talk with a doctor about a different testing schedule.

## Probability of Developing Invasive Cancers Over Selected Age Intervals, by Sex, US, 1995–1997\*

		Birth to 39 (%)	40 to 59 (%)	60 to 79 (%)	Birth to Death (%)
All sites†	Male	1.56 (1 in 64)	8.25 (1 in 12)	33.13 (1 in 3)	43.48 (1 in 2)
	Female	1.97 (1 in 51)	9.37 (1 in 11)	22.39 (1 in 4)	38.34 (1 in 3)
Bladder‡	Male	0.03 (1 in 3,437)	0.44 (1 in 226)	2.39 (1 in 42)	3.40 (1 in 29)
	Female	Less than 1 in 10,000	0.14 (1 in 699)	0.68 (1 in 146)	1.18 (1 in 85)
Breast	Female	0.44 (1 in 225)	4.15 (1 in 24)	7.02 (1 in 14)	12.83 (1 in 8)
Colon & Rectum	Male	0.07 (1 in 1,531)	0.87 (1 in 115)	4.00 (1 in 25)	5.78 (1 in 17)
	Female	0.05 (1 in 1,855)	0.69 (1 in 146)	3.04 (1 in 33)	5.55 (1 in 18)
Leukemia	Male	0.15 (1 in 654)	0.21 (1 in 467)	0.84 (1 in 119)	1.42 (1 in 70)
	Female	0.11 (1 in 900)	0.15 (1 in 671)	0.50 (1 in 199)	1.05 (1 in 95)
Lung & Bronchus	Male	0.04 (1 in 2,499)	1.24 (1 in 80)	6.29 (1 in 16)	8.09 (1 in 12)
	Female	0.03 (1 in 2,997)	0.92 (1 in 108)	4.04 (1 in 25)	5.78 (1 in 17)
Melanoma of the Skin	Male	0.13 (1 in 744)	0.53 (1 in 190)	0.94 (1 in 106)	1.68 (1 in 60)
	Female	0.22 (1 in 453)	0.40 (1 in 249)	0.48 (1 in 207)	1.25 (1 in 80)
Non-Hodgkin's Lymphoma	Male	0.19 (1 in 513)	0.50 (1 in 198)	1.21 (1 in 83)	2.11 (1 in 47)
	Female	0.08 (1 in 1,296)	0.32 (1 in 312)	0.97 (1 in 103)	1.74 (1 in 57)
Prostate	Male	Less than 1 in 10,000	2.06 (1 in 49)	13.42 (1 in 7)	15.89 (1 in 6)
Uterine Cervix	Female	0.17 (1 in 576)	0.30 (1 in 332)	0.26 (1 in 387)	0.78 (1 in 129)
Uterine Corpus	Female	0.05 (1 in 2,142)	0.74 (1 in 136)	1.67 (1 in 60)	2.73 (1 in 37)

\*For those free of cancer at beginning of age interval. Based on cancer cases diagnosed during 1995–1997. The “1 in” statistic and the inverse of the percentage may not be equivalent due to rounding. †Excludes basal and squamous cell skin cancers and in situ carcinomas except urinary bladder. ‡Includes invasive and in situ cancer cases.

Source: DEVCAN Software, Version 4.0, Surveillance, Epidemiology, and End Results Program, 1973–1997, Division of Cancer Control and Population Sciences, National Cancer Institute, 2000.

American Cancer Society, Surveillance Research, 2001

**Treatment:** Surgery is the most common form of treatment for colorectal cancer, and for cancers that have not spread, it is frequently curative. Chemotherapy, or 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 82% and 61%, respectively. When colorectal cancers are detected at an early, localized stage, the 5-year relative survival rate is 90%; 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 65%. The 5-year survival rate for persons with distant metastases is 8%. Survival continues to decline beyond 5 years to 55% survival at 10 years after diagnosis.

## LEUKEMIA

**New Cases:** An estimated 31,500 new cases in 2001, approximately evenly divided between acute leukemia and chronic leukemia. Although often thought of as primarily a childhood disease, leukemia is expected to be diagnosed in many more adults (28,800) than children (2,700) this year. Acute lymphocytic leukemia accounts

for approximately 2,000 of the leukemia cases among children. In adults, the most common types are acute myeloid (approximately 10,000 cases) and chronic lymphocytic (approximately 8,100 cases).

**Deaths:** An estimated 21,500 deaths in 2001.

**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 affects 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 present in gasoline and cigarette smoke. Certain leukemias and lymphomas 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 65%. Survival drops to 44% five years after diagnosis, primarily due to the poor survival of patients with some types of leukemia, such as acute myeloid. 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 60% in the late 1990s. Survival rates for children with acute lymphocytic leukemia have increased from 53% to 82% over the same time period.

## LUNG AND BRONCHUS

**New Cases:** An estimated 169,500 new cases in 2001, accounting for 13% of cancer diagnoses. The incidence rate is declining significantly in men, from a high of 86.5 per 100,000 in 1984 to 69.1 in 1997. In the 1990s, the increasing trend among women leveled off with incidence rates near the 1997 rate of 43.1 per 100,000.

**Deaths:** An estimated 157,400 deaths in 2001, accounting for 28% of all cancer deaths. During 1990-1997, mortality from lung cancer declined significantly among men (-1.7% per year) while rates for women continued to increase, but at a much slower pace. Since 1987, more women have died each year of lung cancer than breast cancer, which, for over 40 years, had been the major cause of cancer death in women. Decreasing lung cancer incidence and mortality rates most likely result from decreased smoking rates over the previous 30 years. However, decreasing smoking patterns among women lag behind those of men. Declines in adult tobacco use have slowed; tobacco use among youth increased considerably during the 1990s.

**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; radon and asbestos, particularly for persons who smoke; radiation exposure from occupational, medical, and environmental sources; air pollution; tuberculosis; and for nonsmokers, environmental tobacco smoke.

**Early Detection:** Early detection is difficult. Chest x-ray, analysis of cells contained in sputum, and fiberoptic examination of the bronchial passages have shown

limited effectiveness in early lung cancer detection. Newer tests such as low-dose helical CT scans and molecular markers in sputum appear to have potential for early lung cancer detection, and are currently being evaluated.

**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 is 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 34% in 1975 to 41% in 1996, largely due to improvements in surgical techniques. However, 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 63,600 new cases in 2001, including 7,400 cases of Hodgkin's disease and 56,200 cases of non-Hodgkin's lymphoma. Since the early 1970s, incidence rates for non-Hodgkin's lymphoma have nearly doubled, although during the 1990s the rate of increase appeared to slow. Incidence rates for Hodgkin's disease have declined somewhat since the early 1970s, particularly among the elderly.

**Deaths:** An estimated 27,600 deaths in 2001 (non-Hodgkin's lymphoma, 26,300; Hodgkin's disease, 1,300).

**Signs and Symptoms:** Enlarged lymph nodes, itching, fever, night sweats, fatigue, 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 alone or with radiotherapy is useful for most patients. Non-Hodgkin's lymphoma: in the 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 treatment programs using highly specific monoclonal antibodies directed at lymphoma cells, and high-dose chemotherapy with bone marrow transplantation, are being tested in selected patients who relapsed 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 91% and 73%, respectively; the 5-year rates are 82% and 52%. Ten years after diagnosis, the relative survival rates for Hodgkin's and non-Hodgkin's disease decline to 73% and 42%; and the 15-year survival rates are 64% and 37%, respectively.

## ORAL CAVITY AND PHARYNX

**New Cases:** An estimated 30,100 new cases in 2001.

Incidence rates are more than twice as high in men as in women and are greatest in men who are over age 40. During 1981-1997, the rates of oral cancers declined.

**Deaths:** An estimated 7,800 deaths in 2001. 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. Difficulties 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:** Radiation therapy and surgery are standard treatments. In advanced disease, chemotherapy may be useful as an adjunct to surgery.

**Survival:** Eighty-two percent of oral cavity and pharynx cancer patients survive 1 year after diagnosis. For all stages combined, the 5-year relative survival rate is 54% and the 10-year rate is 43%.

## OVARY

**New Cases:** An estimated 23,400 new cases in the United States in 2001. It accounts for 4% of all cancers among women and ranks second among gynecologic cancers. During 1991-1997, ovarian cancer incidence rates declined slightly.

**Deaths:** An estimated 13,900 deaths in 2001. Ovarian cancer causes more deaths than any other cancer of the female reproductive system.

**Signs and Symptoms:** The most common sign is enlargement of the abdomen, which is caused by accumulation of fluid. Abnormal vaginal bleeding is rarely a symptom. 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 an evaluation for ovarian cancer, including a thorough 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, also has been associated with endometrial and ovarian cancer. Except for 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 early ovarian cancer. Transvaginal ultrasound and a tumor marker, CA125, may help in diagnosis but are not used for routine screening.

**Treatment:** Surgery, radiation therapy, and chemotherapy are treatment options. Surgery usually includes the removal of the uterus (hysterectomy), and one or both ovaries and fallopian tubes (salpingo-oophorectomy). 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 intra-abdominal disease to enhance the effect of chemotherapy.

**Survival:** Seventy-eight percent of ovarian cancer patients survive 1 year after diagnosis; the 5-year relative survival rate for all stages is 50%. If diagnosed and treated early, the rate is 95%; however, only about 25% of all cases are detected at the localized stage. Five-year relative survival rates for women with regional and distant disease are 79% and 28%, respectively.

## PANCREAS

**New Cases:** An estimated 29,200 new cases in the United States in 2001. Over the past 25 years, rates of pancreatic cancer have declined slowly but consistently in men. A slight decline in incidence rates among women, beginning in the mid-1980s, continued through the 1990s.

**Deaths:** An estimated 28,900 deaths in 2001. Over the past 25 years, there has been a slight but significant

## Five-Year Relative Survival Rates\* by Stage at Diagnosis, 1989-1996

Site	All Stages %	Local %	Regional %	Distant %	Site	All Stages %	Local %	Regional %	Distant %
Breast (female)	85	97	77	21	Ovary	50	95	79	28
Colon & rectum	61	90	65	8	Pancreas	4	17	6	1
Esophagus	12	25	12	2	Prostate†	93	100	—	33
Kidney	61	88	61	9	Stomach	21	60	21	2
Larynx	65	81	52	41	Testis	95	99	97	75
Liver	5	14	5	1	Thyroid	95	100	93	45
Lung & bronchus	14	49	20	2	Urinary bladder	81	93	49	6
Melanoma	88	96	59	13	Uterine cervix	70	92	49	13
Oral	54	81	44	21	Uterine corpus	84	96	64	26

\*Rates are adjusted for normal life expectancy and are based on cases diagnosed from 1989-1996, followed through 1997.

†The rate for local stage represents local and regional stages combined.

**Local:** An invasive malignant cancer confined entirely to the organ of origin. **Regional:** A malignant cancer that 1) has extended beyond the limits of the organ of origin directly into surrounding organs or tissues; 2) involves regional lymph nodes by way of lymphatic system; or 3) has both regional extension and involvement of regional lymph nodes.

**Distant:** A malignant cancer that has spread to parts of the body remote from the primary tumor either by direct extension or by discontinuous metastasis to distant organs, tissues, or via the lymphatic system to distant lymph nodes.

**Source:** Surveillance, Epidemiology, and End Results Program, 1973-1997, Division of Cancer Control and Population Sciences, National Cancer Institute, 2000.

American Cancer Society, Surveillance Research, 2001

decrease in mortality rates among men (about -0.6% per year) while rates among women have remained relatively consistent.

**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 this symptom allows the tumor to be diagnosed at an early stage.

**Risk Factors:** Very little is known about what causes the disease or how to prevent it. Risk increases with age, and smoking is a risk factor. Incidence rates are more than twice as high for smokers as for nonsmokers. Some studies have suggested associations with chronic pancreatitis, diabetes, and cirrhosis. Pancreatic cancer rates are higher in countries whose populations eat a diet high in fat.

**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 that can extend survival and/or relieve symptoms in many patients but are not likely to produce a cure for most. Clinical trials with several new agents may offer improved survival and should be considered an option.

**Survival:** For all stages combined, the 1-year relative survival rate is only 20%, and the 5-year rate is 4%.

## PROSTATE

**New Cases:** An estimated 198,100 new cases in the US during 2001. Prostate cancer incidence rates remain significantly higher in black men than in white men. Between 1988 and 1992, prostate cancer incidence rates increased dramatically, due to earlier diagnosis in men without any symptoms, through increased use of the prostate-specific antigen (PSA) blood test. Prostate cancer incidence rates subsequently declined and have leveled off. Rates peaked in 1992 among white men and in 1993 among black men.

**Deaths:** An estimated 31,500 deaths in 2001, the second leading cause of cancer death in men. Although mortality rates are declining among white and black men, rates in black men remain more than twice as high as rates in 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; continual pain in lower back, pelvis, or upper thighs. Most of these symptoms are nonspecific and are similar to those caused by benign conditions.

**Risk Factors:** The incidence of prostate cancer increases with age; more than 70% of all prostate cancers are diagnosed in men over age 65. Black 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 strong familial predisposition may be responsible for 5%-10% of prostate

cancers. International studies suggest that dietary fat may also be a factor.

**Early Detection:** The prostate-specific antigen (PSA) test and the digital rectal examination should be offered annually beginning at age 50 to men who have a life expectancy of at least 10 years. Men at high risk (African-American men and men who have a first-degree relative diagnosed with prostate cancer at a young age) should begin testing at age 45. Patients should be given information about the benefits and limitations of testing.

**Treatment:** Depending on age, stage of the cancer, and other medical conditions of the patient, surgery and radiation should be discussed with the patient's physician. Hormonal therapy 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 and other symptoms. Careful observation without immediate active treatment ("watchful waiting") may be appropriate, particularly for older individuals with low-grade and/or early stage tumors.

**Survival:** Eighty percent of all prostate cancers are discovered in the local and regional stages; the 5-year relative survival rate for patients whose tumors are diagnosed at these stages is 100%. Over the past 20 years, the survival rate for all stages combined has increased from 67% to 93%. Survival after a diagnosis of prostate cancer continues to decline beyond 5 years. According to the most recent data, 72% of men diagnosed with prostate cancer survive 10 years and 53% survive 15 years.

## SKIN

**New Cases:** More than 1 million cases a year of highly curable basal cell or squamous cell cancers. The most serious form of skin cancer is melanoma, which is expected to be diagnosed in about 51,400 persons in 2001. During the 1970s, the incidence rate of melanoma increased about 6% per year. Since 1981, the incidence rate of melanoma has increased about 3% per year on average, to a rate of 14.3 per 100,000 in 1997. Incidence rates are more than 10 times higher in whites than in blacks. Other important skin cancers include Kaposi's sarcoma and cutaneous T-cell lymphoma.

**Deaths:** An estimated 9,800 deaths this year, 7,800 from melanoma and 2,000 from other skin cancers.

**Signs and Symptoms:** Any change on the skin, especially 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; and multiple nevi (moles) or atypical nevi.

**Prevention:** Limit or avoid exposure to the sun during the midday hours (10 a.m.-4 p.m.). When outdoors, cover as much skin as possible. Wear a hat that shades the face, neck, and ears, and a long-sleeved shirt and long pants. Wear sunglasses to protect the skin around the eyes. Use a sunscreen with a solar protection factor (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:** 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, with variable degrees of tan, brown, or black. **D** is for diameter greater than 6 millimeters. Any sudden or progressive increase in size should be of concern.

**Treatment:** Treatment for basal cell cancer and squamous cell cancer includes surgery (in 90% of cases), radiation therapy, electrodesiccation (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 with radiation therapy, immunotherapy, or chemotherapy.

**Survival:** For basal cell or squamous cell cancers, cure is highly likely if detected and treated early. Melanoma can spread to other parts of the body quickly. When detected in its earliest stages, however, and treated properly, it is highly curable. The 5-year relative survival rate for patients with melanoma is 88%. For localized melanoma, the 5-year relative survival rate is 96%; rates for regional and distant disease are 59% and 13%, respectively. About 82% of melanomas are diagnosed at a localized stage.

## Trends in 5-Year Relative Survival Rates\* by Race and Year of Diagnosis, US, 1974–1996

Site	White			Black			All Races		
	Relative 5-Year Survival Rate (%) 1974-76	1980-82	1989-96	Relative 5-Year Survival Rate (%) 1974-76	1980-82	1989-96	Relative 5-Year Survival Rate (%) 1974-76	1980-82	1989-96
All Sites	51	52	62†	39	40	49†	50	51	60†
Brain	22	25	30†	27	31	38†	23	25	31†
Breast (female)	75	77	86†	63	66	71†	75	76	85†
Colon	51	56	63†	46	49	52†	51	55	62†
Esophagus	5	8	13†	4	5	9†	5	7	12†
Hodgkin's disease	72	75	83†	69	72	77	71	75	82†
Kidney	52	51	62†	49	56	58†	52	52	61†
Larynx	67	69	66	59	58	54	66	68	65
Leukemia	35	40	45†	32	33	34	35	39	44†
Liver	5	4	6†	2	2	3	4	4	5†
Lung & bronchus	13	14	14†	12	12	11	12	13	14†
Melanoma	80	83	89†	67‡	61§	70‡	80	83	88†
Multiple myeloma	24	28	28†	28	30	31	25	28	29†
Non-Hodgkin's lymphoma	48	52	53†	49	50	42†	47	51	52†
Oral cavity	55	56	56	36	31	35	54	53	54
Ovary	37	39	50†	41	38	48†	37	39	50†
Pancreas	3	3	4†	3	5	4†	3	3	4†
Prostate	68	75	94†	59	65	87†	67	73	93†
Rectum	49	53	61†	42	38	52†	49	52	60†
Stomach	15	16	20†	17	19	22	15	18	21†
Testis	79	92	96†	76‡	90‡	88	79	92	95†
Thyroid	92	94	96†	88	95	91	92	95	95†
Urinary bladder	74	79	82†	48	59	64†	73	78	81†
Uterine cervix	70	68	72†	64	61	59	69	67	70
Uterine corpus	89	83	86†	61	55	57	88	82	84†

\*Rates are adjusted for normal life expectancy and are based on cases diagnosed from 1989-1996, followed through 1997. †The difference in rates between 1974-76 and 1989-96 is statistically significant ( $P < 0.05$ ). ‡The standard error of the survival rate is between 5 and 10 percentage points. §The standard error of the survival rate is greater than 10 percentage points.

Source: Surveillance, Epidemiology, and End Results Program, 1973-1997, Division of Cancer Control and Population Sciences, National Cancer Institute, 2000.

American Cancer Society, Surveillance Research, 2001

## URINARY BLADDER

**New Cases:** An estimated 54,300 new cases in 2001.

Bladder cancer incidence rates among men have declined slowly but significantly since the late 1980s, while rates among women have remained fairly constant. Overall, bladder cancer incidence is about four times higher in men than in women, and about two times higher in whites than in blacks.

**Deaths:** An estimated 12,400 deaths in 2001. Between the early 1970s and the late 1980s, mortality rates for bladder cancer decreased significantly in both whites and blacks; during the 1990s, mortality rates continued to decline among blacks, but remained fairly constant among 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. Smokers experience twice the risk of nonsmokers. Smoking is estimated to be responsible for about 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 have a 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 through the urethra.

**Treatment:** Surgery, alone or in combination with other treatments, is used in more than 90% of cases. Superficial, localized cancers may be treated by administering immunotherapy or chemotherapy directly into the bladder. 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 93%; 74% of cancers are detected this early. For regional and distant stages, 5-year relative survival rates are 49% and 6%, respectively. Beyond five years, survival continues to decline with 73% of patients surviving 10 years after diagnosis, and 67% surviving 15 years.

## UTERINE CERVIX

**New Cases:** An estimated 12,900 cases of invasive cervical cancer are expected to be diagnosed in 2001. Incidence rates have decreased steadily over the past several decades. In 1993-1997, the incidence rate in black women (11.4 per 100,000) was higher than the rate in white women (7.1 per 100,000). As Pap screening has become more prevalent, preinvasive lesions of the cervix are detected far more frequently than invasive cancer.

**Deaths:** An estimated 4,400 cervical cancer deaths in 2001. Mortality rates have also declined sharply over the past several decades. Since 1982, cervical cancer mortality rates have declined on average about -1.5% per year.

**Signs and Symptoms:** Abnormal vaginal bleeding or spotting; abnormal vaginal discharge. Pain and systemic symptoms are late symptoms 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 sex at an early age, many sexual partners, or have partners who have had many sexual partners are at higher risk of developing the disease. Cigarette smoking is another factor associated with cervical cancer.

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

**Treatment:** For preinvasive lesions, 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), by laser ablation, or by local surgery. Invasive cervical cancers generally are treated by surgery or radiation, or both, as well as chemotherapy in some cases.

**Survival:** Survival for patients with preinvasive lesions is nearly 100%. Eighty-eight percent of cervical cancer patients survive 1 year after diagnosis, and 70% survive 5 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 92% for localized cancers. Whites are more likely than blacks to have their cancers diagnosed at this early stage. Fifty-five percent of invasive cervical cancers among white women and 45% of cancers among black women are diagnosed at a localized stage.

## UTERINE CORPUS (ENDOMETRIUM)

**New Cases:** An estimated 38,300 cases of cancer of the uterine corpus (body of the uterus), usually of the endometrium or lining of the uterus, are expected to be diagnosed in 2001. Incidence rates are higher among white women (22.6 per 100,000) than among black women (15.3 per 100,000).

**Deaths:** An estimated 6,600 deaths in 2001. Although incidence rates are higher among white women than black women, the relationship is reversed for mortality rates—black women have mortality rates that are nearly twice as high as rates among white women.

**Signs and Symptoms:** Abnormal uterine bleeding or spotting. Pain and systemic symptoms are late symptoms.

**Risk Factors:** High cumulative exposure to estrogen is the major risk factor for the most common type of cancer of the uterine corpus. 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 plus estrogen replacement therapy (called hormone replacement therapy or HRT) is believed to largely offset the increased risk related to HRT using only estrogen. Research has not implicated estrogen exposures in the development of the other types of uterine corpus cancer, which are more aggressive and have a poorer prognosis. Other risk factors for uterine corpus cancer include infertility, diabetes, gallbladder disease, hypertension, and obesity. Pregnancy and the use of oral contraceptives appear to provide protection against endometrial cancer. Hereditary non-polyposis colon cancer, a genetic syndrome, also has been associated with endometrial and ovarian cancer.

**Early Detection:** Most endometrial cancer is diagnosed at an early stage because of post-menopausal bleeding. Beginning at age 35, women with or at risk for hereditary non-polyposis colon cancer (HNPCC) should be offered endometrial biopsy annually to screen for endometrial cancer.

**Treatment:** Uterine corpus 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 64% if diagnosed at a regional stage. Relative survival rates for whites exceed those for blacks by at least 15 percentage points at every stage.

# SPECIAL SECTION: OBESITY

The adverse effects of obesity on heart disease, stroke, and diabetes are more widely recognized than the importance of obesity to certain cancers. However, accumulating evidence suggests that obesity increases the risk of the following cancers:<sup>1</sup>

## Women

Breast (post-menopausal)  
Endometrium (uterine corpus)  
Uterine cervix  
Ovarian  
Gallbladder

## Men

Colon  
Prostate

- The relative risk of breast cancer in post-menopausal women is 50% higher for the obese.<sup>1,2</sup>
- The relative risk for colon cancer in men is 40% higher for the obese.<sup>1</sup>
- The relative risks of gallbladder and endometrial cancer are five times higher for obese individuals compared with individuals with a “healthy” weight.<sup>2</sup>
- Some studies have also shown a positive association between obesity and cancers of the kidney, pancreas, rectum, esophagus, and liver.<sup>3</sup>

- Obesity alters complex interactions among diet, metabolism, physical activity, hormones, and growth factors.<sup>3</sup>
- In 1981, approximately 2% of all cancer deaths in the United States were attributed to overweight, and more than one-third of all cancer deaths to dietary factors in adulthood.<sup>2-4</sup>

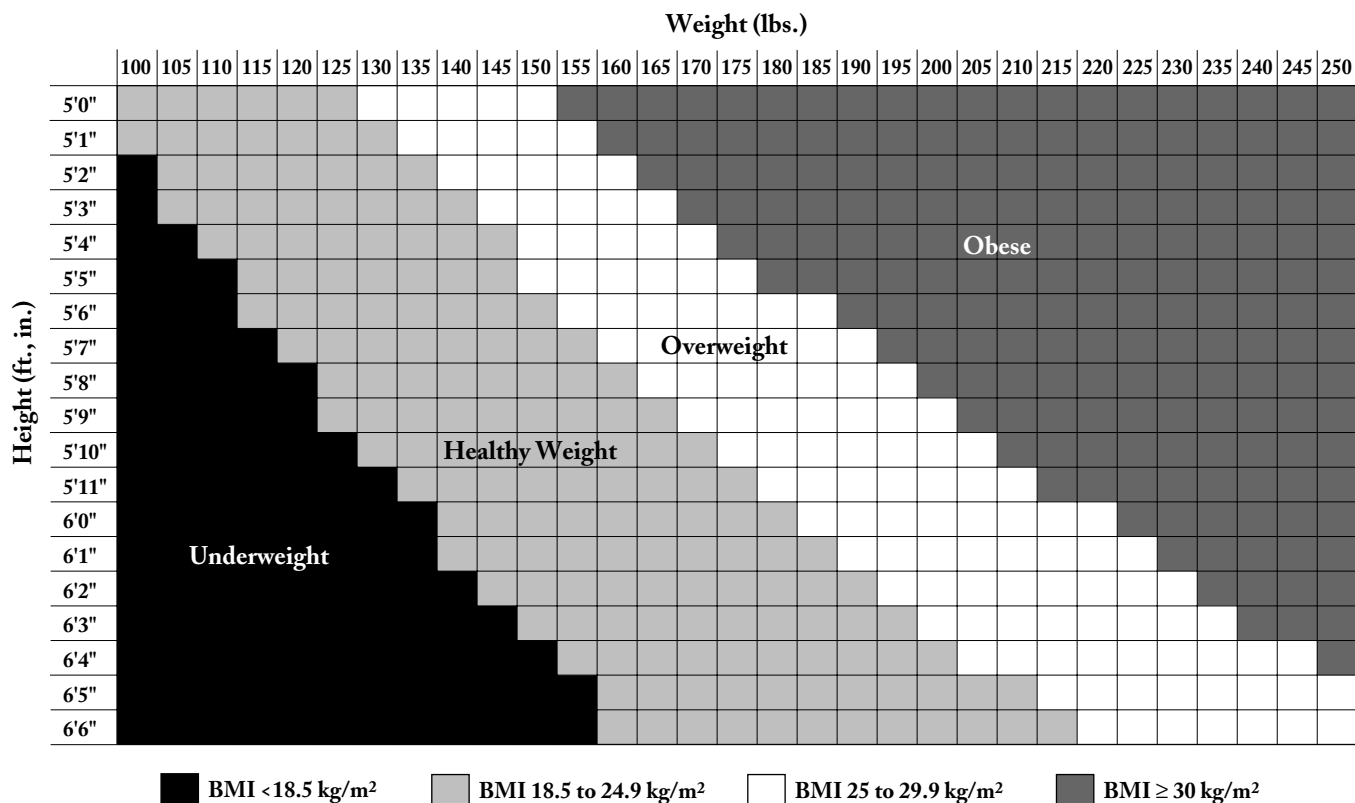
The increases in obesity in the past two decades are likely to increase cancer deaths attributable to obesity today.

## Definition of Overweight and Obesity

Overweight and obesity are commonly measured using a formula that combines weight and height. An individual’s body mass index (BMI) is the ratio of weight (in kilograms) to height (in meters, squared). The formula to calculate BMI in terms of pounds and inches is:

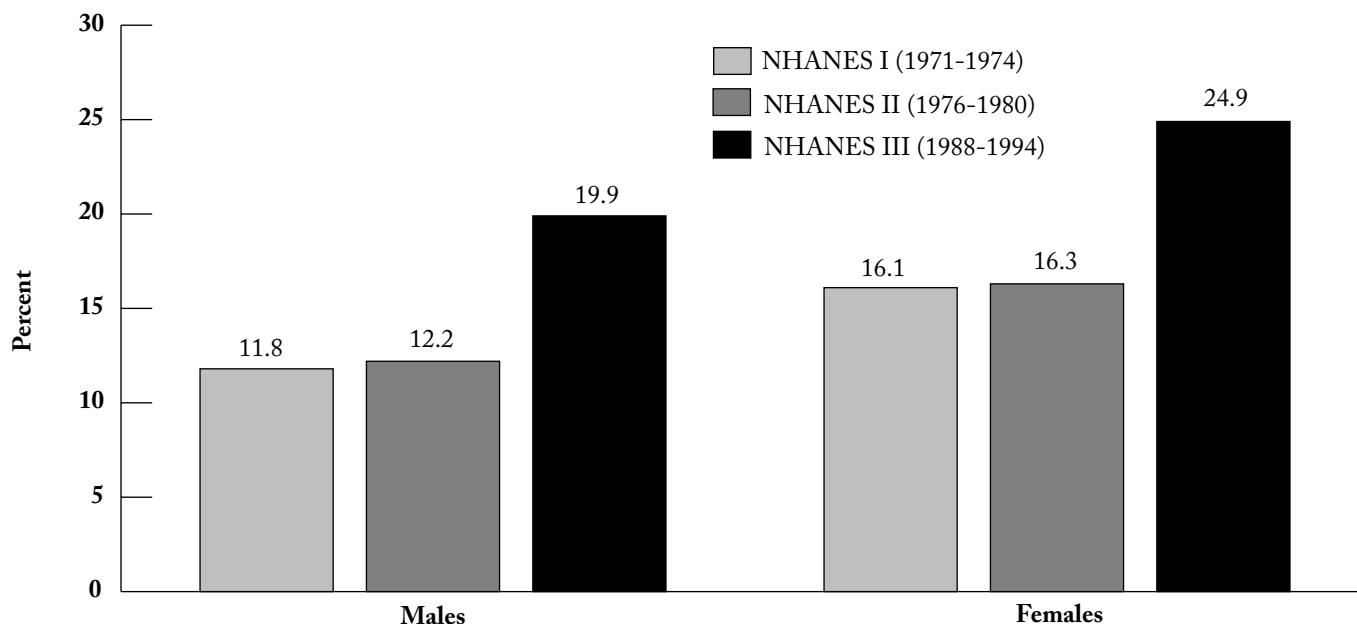
$$\text{BMI} = \frac{(\text{Weight in pounds})/2.20}{[(\text{Height in inches})/32.37]^2}$$

Figure 1. Body-Mass Index Chart, Adults 20 and Older



American Cancer Society, Surveillance Research, 2001

**Figure 2. Trends in Obesity, Adults Aged 20-74, US, 1971-1974 to 1988-1994**



Source: National Health and Nutrition Examination Survey (NHANES), 1971-1994, National Center for Health Statistics, Centers for Disease Control and Prevention.

American Cancer Society, Surveillance Research, 2001

The technical term, BMI, corresponds to gradations of body fatness for adults aged 20 years and older.

- BMI <18.5 kg/m<sup>2</sup> = underweight
- BMI 18.5–24.9 kg/m<sup>2</sup> = healthy weight
- BMI 25.0–29.9 kg/m<sup>2</sup> = overweight
- BMI ≥30.0 kg/m<sup>2</sup> = obese

Individuals can find in which BMI range they fall in relation to the National Institutes of Health guidelines in Figure 1. BMI does not necessarily correspond to the same degree of fatness among different individuals and populations, due to differences in body proportion and composition.<sup>5</sup> Alternative ways to assess weight status are measuring waist circumference, skinfold thickness, and bioimpedance.<sup>5, 6</sup>

### The Obesity Epidemic

In 1998, more than 50% of the US population was overweight—an estimated 97 million adults.<sup>7,8</sup>

Furthermore, the percentage of obese adults (BMI ≥30 kg/m<sup>2</sup>) aged 20-74 increased from 14.5% to 22.5% in the 20-year period between 1974 and 1994.<sup>9</sup>

- Females were more likely than males to be obese for all survey years. (Figure 2)
- Prevalence of male obesity increased from 11.8% to 19.9%. (Figure 2)

Obesity in American children and adolescents has also increased and may lead to an even greater increase in adult obesity in the future.<sup>10-12</sup> Prevention and policy

measures need to be adopted to reduce the prevalence of obesity.

Obesity increased throughout the 1990s. According to data from the Behavioral Risk Factor Surveillance System (BRFSS), the number of states with an obesity prevalence greater than the Healthy People 2010 goal of 15 % increased from 4 to 39 between the years 1991 and 1998.<sup>13</sup> (Figure 3)

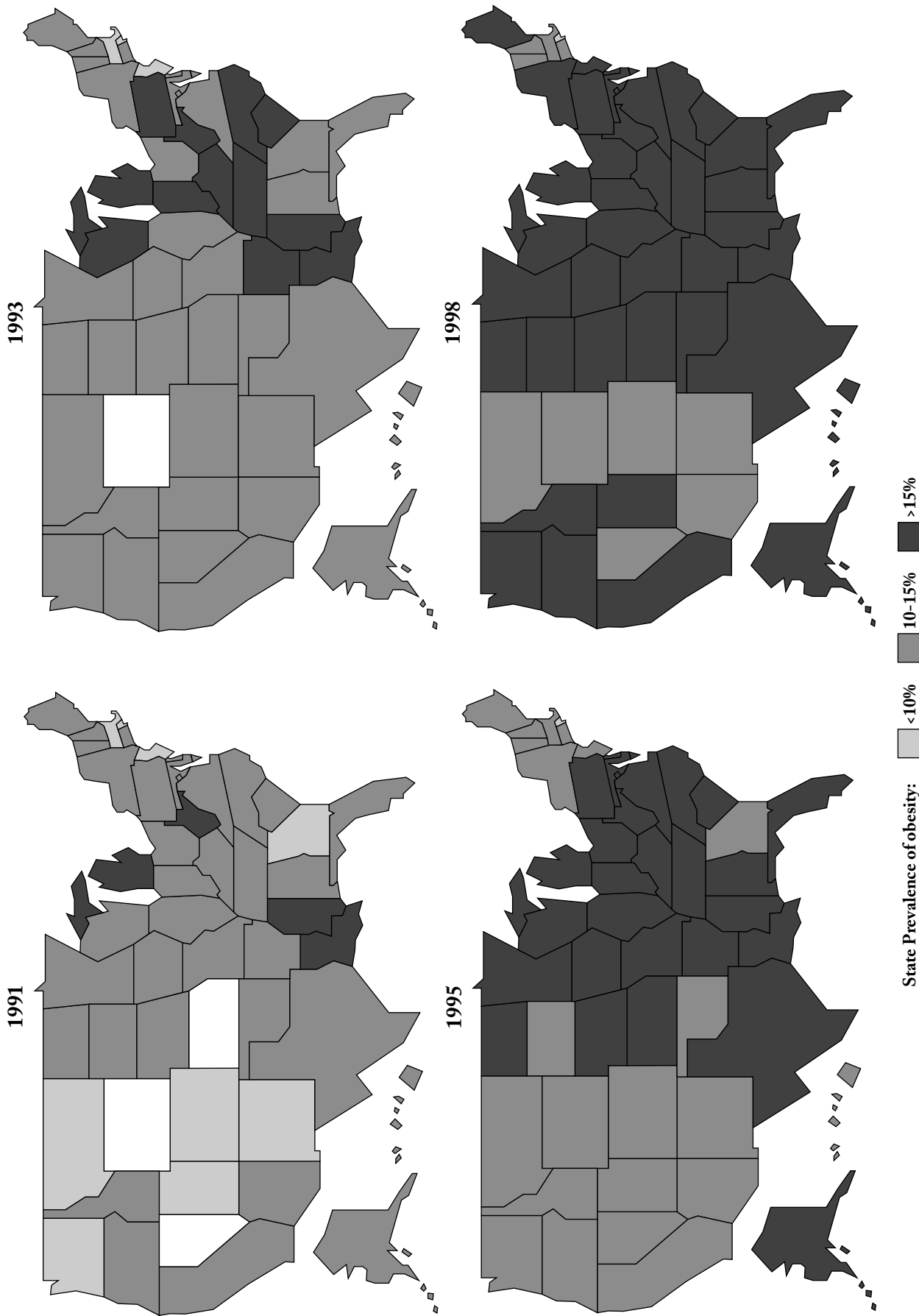
Analysis of BRFSS data from 1994 and 1998 shows (Table 1):

- Prevalence of male obesity increased from 15.1% to 18.2%.
- Prevalence of female obesity increased from 14.6% to 18.5%.
- Prevalence of obesity for both genders increased regardless of age, race, or marital status, education level, smoking status, or leisure time activity.

### Obesity as a Medical Problem

Obesity can be defined formally as an increase above healthy weight that reduces life expectancy.<sup>14</sup> At BMI levels above healthy weight, illness from numerous health conditions increases with increasing BMI.<sup>15</sup> Obesity adversely affects hypertension, lipid disorders, type 2 diabetes, coronary heart disease, stroke, gall-bladder disease, osteoarthritis, sleep apnea and respiratory problems. Obesity may also complicate pregnancy, and contribute to menstrual irregularities, hirsutism,

**Figure 3. The Spread of the Obesity\* Epidemic, by State†**



\*Obesity is defined as a BMI of 30 or greater. †Information on weight and height was not collected for states in white.

Note: The Healthy People 2010 Goal is to reduce the proportion of adults who are obese to less than 15%.

Source: Behavioral Risk Factor Surveillance System, CD-ROM 1984-1995, 1998, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 1997, 2000.



stress incontinence, and psychological disorders, and invoke social stigmatization and discrimination. As the second leading cause of preventable death in the United States, obesity is a serious public health threat.<sup>15</sup>

Obesity is associated with increased mortality rates from all causes combined, all cardiovascular diseases, and all other conditions.<sup>16</sup> This relationship is illustrated in men (Figure 4) and women (Figure 5) with data from the Cancer Prevention Study II, a large American Cancer Society epidemiologic study.

Obesity is estimated to cause 300,000 premature deaths each year;<sup>17</sup> the associated burden of disease is enormous. It is estimated that the direct costs of treating conditions triggered by obesity are \$51.6 million, and the indirect costs from lost economic productivity are \$47.6 million.<sup>18,19</sup> The direct costs associated with obesity represent 5.7% of our National Health Expenditure in the United States.<sup>18</sup>

**Table 1. Prevalence of Obesity by Gender and Demographic and Behavioral Characteristics, 1994 and 1998**

	Males					Females				
	1994	Weighted Prevalence (%)		Increase, %†	1998	1994	Weighted Prevalence (%)		Increase, %†	
	95% CI*	95% CI*	95% CI*			95% CI*				
<b>Overall</b>	15.1	(14.6, 15.6)		3.1	18.2	14.6	(14.2, 15.0)		3.9	
<b>Age in years</b>										
18-29	10.1	(9.1, 11.2)		2.5	12.6	9.2	(8.4, 10.0)		3.1	
30-39	15.5	(14.4, 16.6)		2.8	18.3	13.3	(12.4, 14.2)		3.2	
40-49	18.6	(17.3, 19.9)		3.0	21.6	18.2	(17.0, 19.4)		4.0	
50-59	20.6	(18.9, 22.3)		3.1	23.7	21.0	(19.6, 22.4)		3.9	
60-69	17.1	(15.5, 18.7)		4.8	21.9	18.2	(16.8, 19.6)		4.0	
70+	10.7	(9.2, 12.2)		1.9	12.6	12.5	(11.5, 13.6)		3.9	
<b>Race</b>										
White	14.8	(14.2, 15.4)		3.3	18.1	13.0	(12.5, 13.5)		3.3	
Black	19.5	(17.5, 21.4)		3.3	22.8	27.8	(26.2, 29.5)		3.7	
Hispanic	17.1	(14.6, 19.6)		1.8	18.9	16.2	(14.0, 18.4)		7.6	
Other	8.6	(6.9, 10.4)		2.4	11.0	11.0	(9.0, 12.9)		2.4	
<b>Marital status</b>										
Married	16.4	(15.7, 17.1)		3.9	20.3	14.2	(13.6, 14.8)		3.8	
Divorced	14.7	(13.0, 16.4)		3.0	17.7	17.1	(15.7, 18.4)		5.0	
Widowed	16.4	(13.5, 19.3)		0.9	17.3	17.2	(16.0, 18.4)		2.6	
Separated	14.5	(10.9, 18.1)		4.4	18.9	23.1	(19.8, 26.5)		2.1	
Never married	11.6	(10.5, 12.8)		1.6	13.2	11.9	(10.8, 12.9)		4.3	
Unmarried couple	14.0	(10.0, 18.1)		0.7	14.7	10.4	(7.8, 13.0)		6.4	
<b>Education</b>										
<High school degree	18.9	(17.2, 20.5)		2.0	20.9	22.6	(21.2, 24.0)		5.5	
High school degree	16.1	(15.1, 17.1)		3.7	19.8	16.0	(15.2, 16.7)		4.0	
Some college	15.6	(14.5, 16.7)		3.4	19.0	13.0	(12.2, 13.8)		4.8	
College degree	11.5	(10.6, 12.4)		3.2	14.7	8.8	(8.1, 9.5)		3.4	
<b>Smoking status</b>										
Never	13.8	(13.1, 14.6)		4.0	17.8	15.0	(14.4, 15.6)		3.8	
Former	18.5	(17.5, 19.6)		3.4	21.9	15.5	(14.6, 16.5)		5.4	
Current	13.3	(12.3, 14.3)		1.6	14.9	12.5	(11.6, 13.4)		3.0	
<b>Leisure-time activity</b>										
Inactive	20.1	(18.9, 21.3)		2.5	22.6	20.2	(19.3, 21.1)		5.3	
Irregular	14.1	(13.2, 15.0)		4.0	18.1	14.6	(13.7, 15.5)		3.6	
Regular	12.6	(11.9, 13.3)		3.1	15.7	10.4	(9.8, 11.0)		3.5	

\*95% CI= 95% Confidence interval of the prevalence estimate. †All increases are statistically significant at  $P < 0.05$ .

Source: Behavioral Risk Factor Surveillance System, CD-ROM 1984-1995, 1998, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 1997, 2000.

## Factors Influencing Obesity

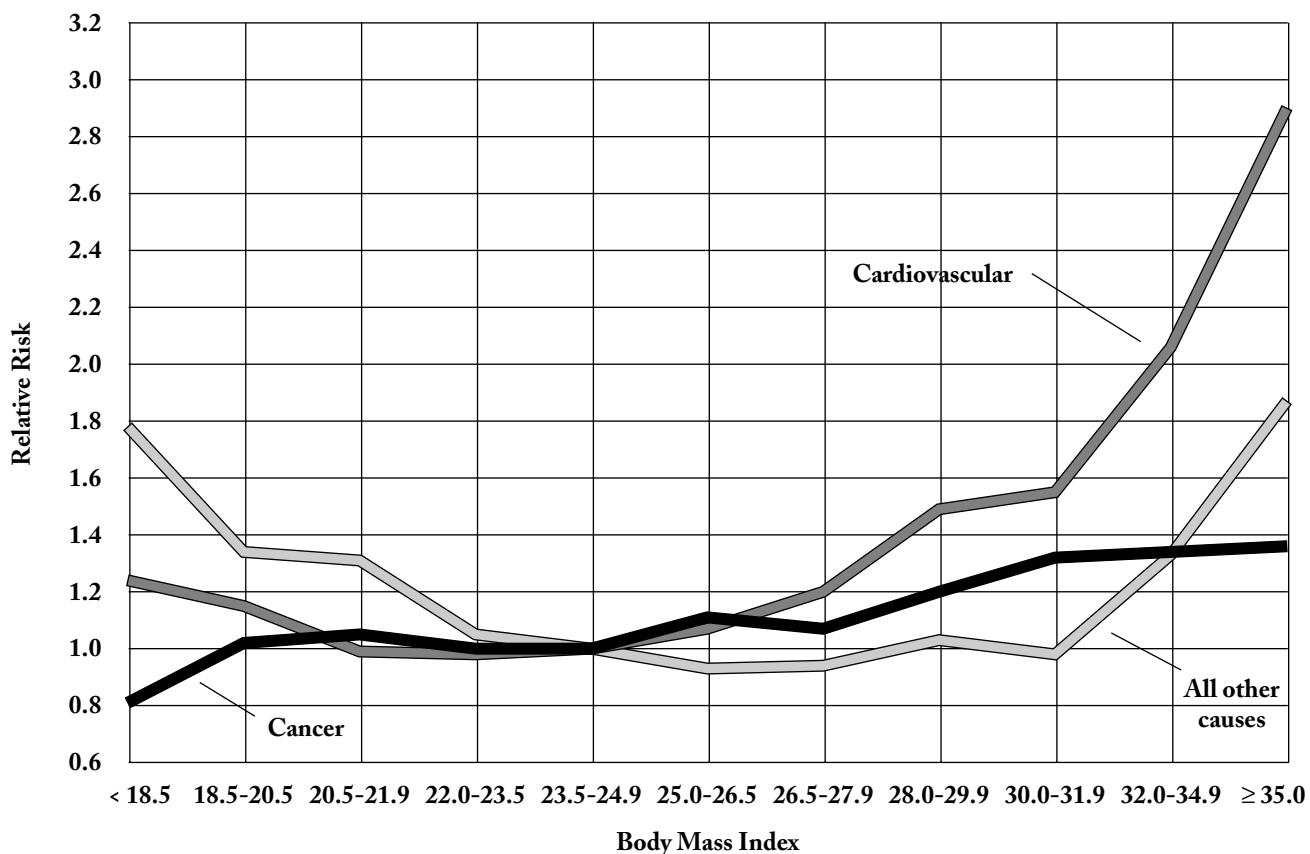
Obesity develops through a combination of multiple factors, including genetic, environmental, psychosocial, and physiologic.

**Environmental/Physiologic:** The balance between caloric intake and energy use is a central environmental factor that affects obesity. This balance has been altered for many Americans by decreases in physical activity. More time is devoted to television and computers; there is less emphasis on physical education in schools; many neighborhoods lack safe sidewalks and roadways to allow pedestrian and bicycle traffic.<sup>20</sup> Labor saving devices at home and in the workplace reduce physical activity, and the automobile has replaced walking or biking.<sup>21</sup> In contrast, caloric intake has increased, due to greater availability of food and drink, foods with higher energy content, and the growth of the fast food and snack food industries.<sup>20</sup>

**Genetic:** Overweight and obesity often appear to run in families, but the influence of inherited genes is strongly modified by nongenetic factors. Aside from some rare obesity-associated (monogenic) syndromes, the genetic influences operate through susceptibility genes.<sup>6</sup> These genes increase the risk of developing obesity, although, acting alone, do not sufficiently account for the development of obesity.<sup>6</sup>

**Demographic:** In both men and women the prevalence of overweight and obesity increases with age until age 50 or 60. There are also variations in obesity among different racial groups—this is particularly apparent in the increased prevalence of obesity among female African Americans in the United States. Lower socioeconomic status (determined by educational level) is associated with a higher prevalence of overweight and obesity. There is also a tendency for overweight and obesity to increase after marriage. (Table 1)

**Figure 4. Body Mass Index and Mortality in Men**



Source: Cancer Prevention Study II, American Cancer Society.<sup>16</sup>  
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American Cancer Society, Surveillance Research, 2001

## Behaviors That Affect a Healthy Body Weight

The American Cancer Society Nutrition Guidelines (see page 33) recommend that Americans eat 5 or more servings of fruits and vegetables each day. Less than one-fourth of US adults reported eating the recommended amount of fruits and vegetables daily according to 1998 survey data. (Figure 6) Eating other foods from plant sources, such as breads, cereals, grain products, rice, pasta, or beans several times each day can also help maintain weight. Populations with higher consumption of fruits and vegetables have lower incidence of gastrointestinal and respiratory tract cancers.<sup>22</sup>

ACS guidelines also recommend a diet that is low in saturated fats and high-fat meats.

Many Americans do not participate in leisure-time physical activity.<sup>23</sup> According to 1998 survey data, approximately 28% of American adults do not engage in any leisure-time physical activity. (Figure 7) Physical

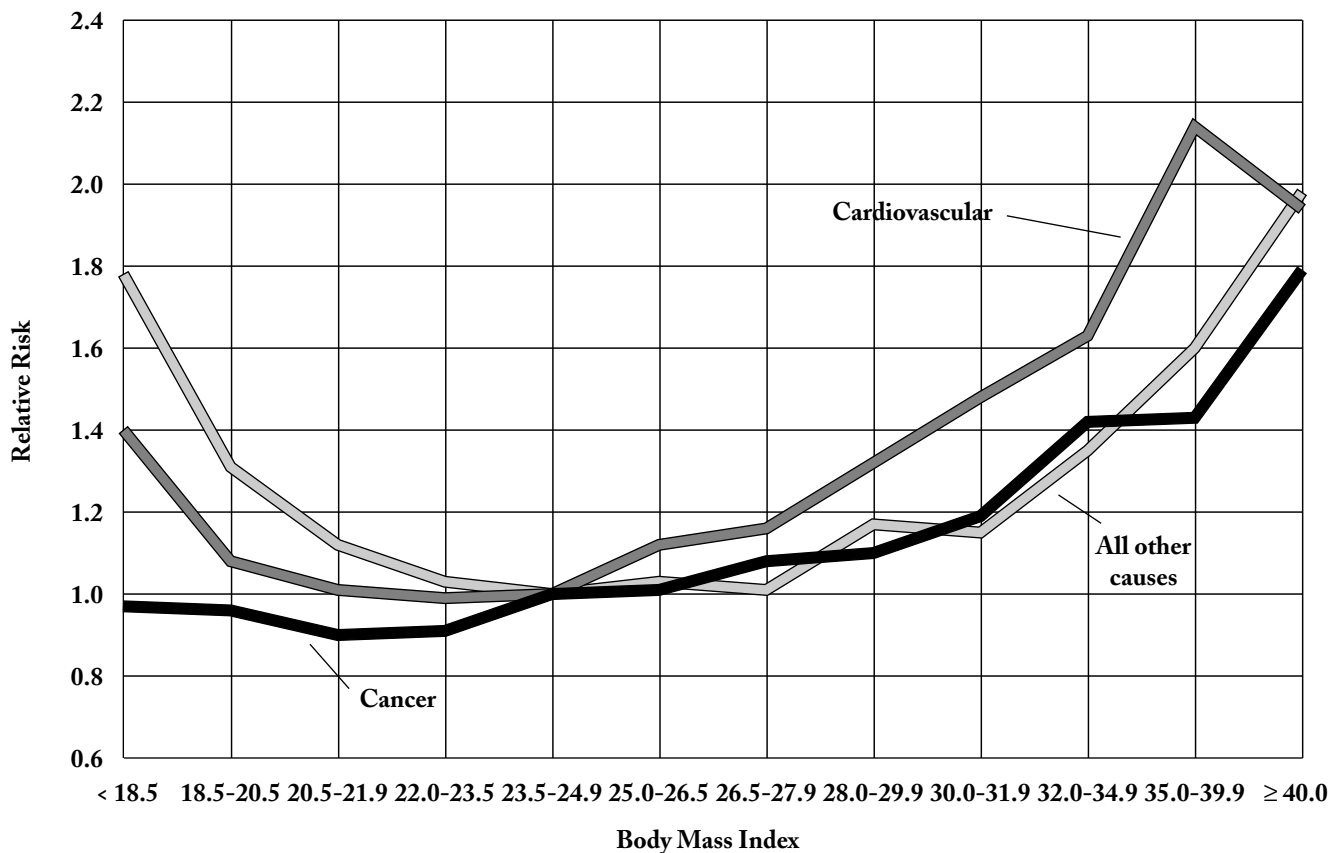
activity can help protect against some cancers, either by balancing caloric intake with energy expenditure or by other mechanisms. The clinical guidelines published by the National Heart, Lung, and Blood Institute and the federal dietary guidelines for Americans recommend at least 30 minutes of physical activity 5 or more times per week for all healthy adults.<sup>15</sup>

## Suggested Public Health Approaches to Reduce the Prevalence of Obesity

The prevalence of obesity is rapidly increasing worldwide in both industrialized and developing countries. Social policies as well as individual actions are needed to slow or reverse these trends. Approaches that have been proposed include:<sup>24</sup>

**Education:** promote healthy lifestyles; increase physical activity at school.

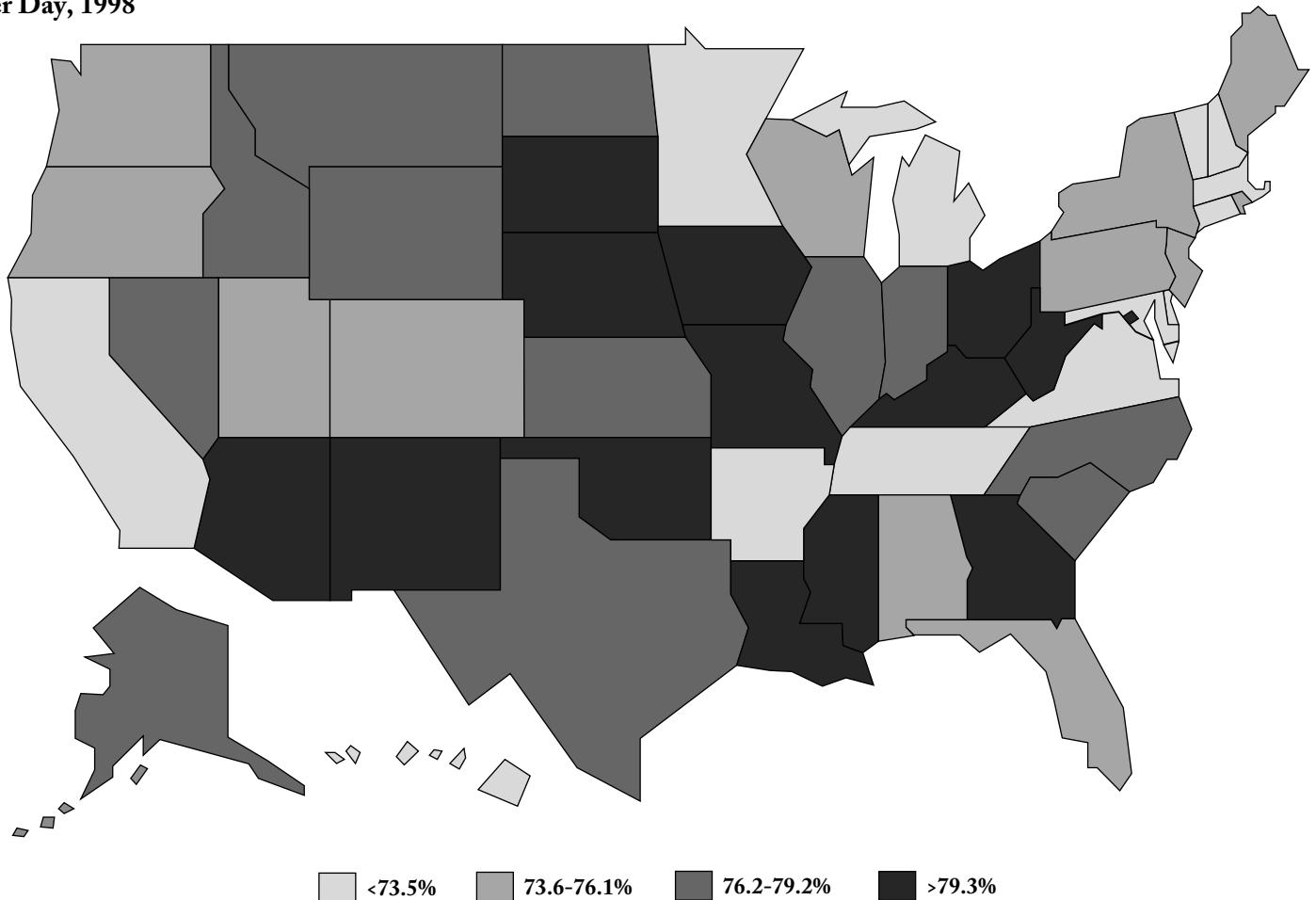
**Figure 5. Body Mass Index and Mortality in Women**



Source: Cancer Prevention Study II, American Cancer Society.<sup>16</sup>  
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American Cancer Society, Surveillance Research, 2001

**Figure 6. Percentage of Adults Who Do Not Consume Five or More Servings of Fruits and Vegetables Per Day, 1998**



**Note:** The Healthy People 2010 Goal is at least 2 servings of fruits (75%) and at least 3 servings of vegetables (50%) per day.

**Source:** Behavioral Risk Factor Surveillance System, CD-ROM 1998, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2000.

American Cancer Society, Surveillance Research, 2001

**Food labeling and advertising:** increase public awareness of the nutrient content of foods (i.e., calories, fat, sugar, etc.).

**Food assistance programs:** lower the prices of healthy foods.

**Health care and training:** require health care providers to teach principles of healthy diet and exercise patterns.

**Transportation and urban planning/development:** provide funding for recreational activities; develop new techniques for zoning and urban planning to promote physical activity in the community.

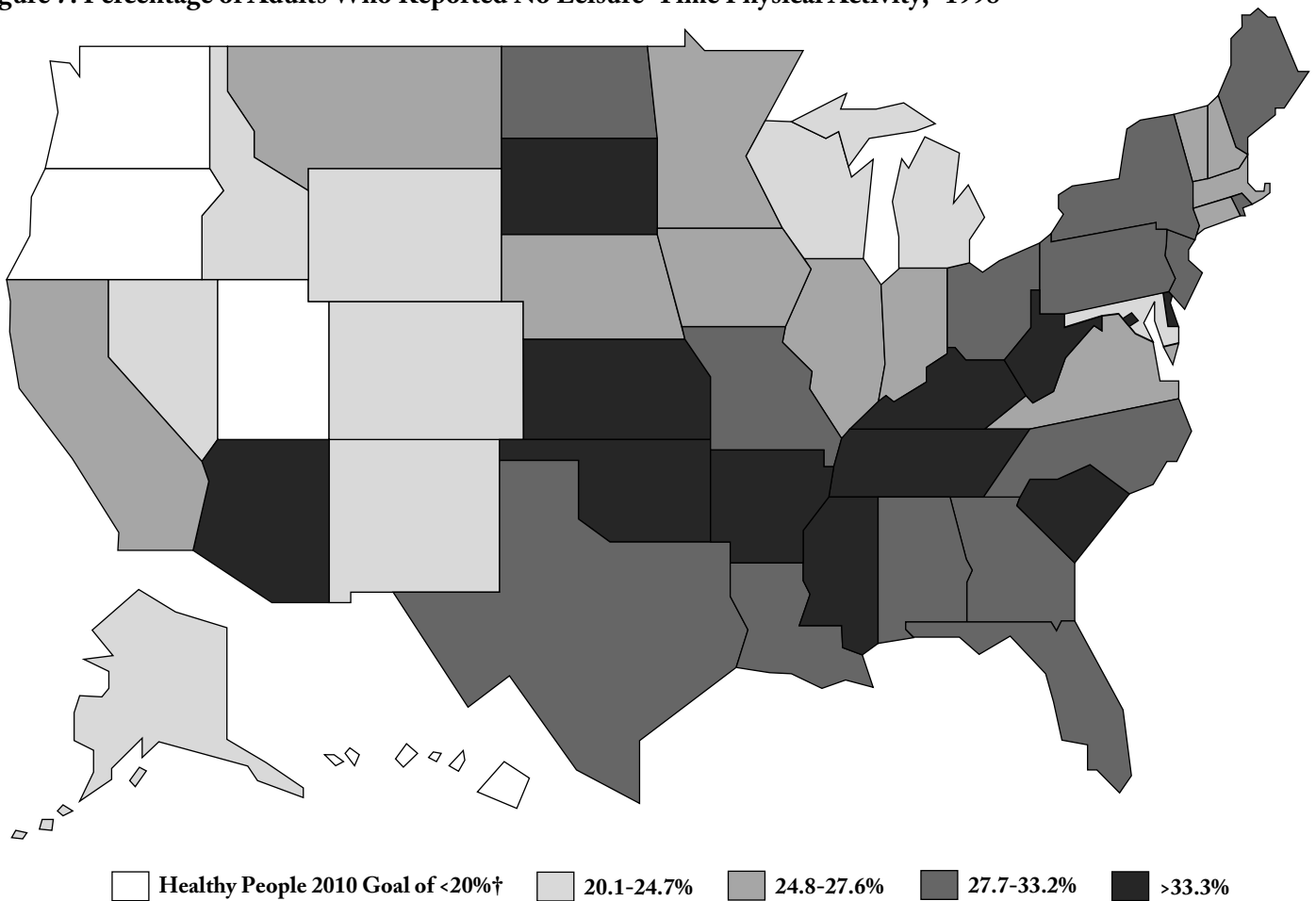
**Taxes:** levy taxes on high-calorie foods and drinks.

**Policy development:** develop a national agenda to prevent obesity.

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**Figure 7. Percentage of Adults Who Reported No Leisure-Time Physical Activity,\* 1998**



\*No exercise, recreation, or physical activity (other than regular job duties) during the previous month.

†The Healthy People 2010 Goal is to reduce the proportion of adults who engage in no leisure-time physical activity to 20%.

Source: Behavioral Risk Factor Surveillance System, CD-ROM 1998, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2000.

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# CANCER IN MINORITIES

In 2001, about 1,268,000 cancers are expected to be diagnosed in the United States and 553,400 Americans are expected to die of this disease.

Overall, black Americans are more likely to develop cancer than persons of any other racial and ethnic group. During 1990-1997, incidence rates were 444.6 per 100,000 among blacks, 402.1 per 100,000 among whites, 272.9 per 100,000 among Hispanics, 279.3 per 100,000 among Asian/Pacific Islanders, and 152.8 per 100,000 among American Indians. During these same years, cancer incidence rates decreased among whites (-1.0% per year), blacks (-0.5%), Hispanics (-1.6% per year), and American Indians (-0.6% per year), and remained relatively stable among Asian/Pacific Islanders.

Reported incidence rates of female breast cancer are

highest among white women (114.0 per 100,000) and lowest among American Indian women (33.4 per 100,000). Black women have the highest incidence rates of colon and rectum (45.2 per 100,000) and lung and bronchus cancer (45.8 per 100,000) followed by whites, Asian/Pacific Islanders, Hispanics, and American Indians, respectively for both cancer sites.

Black men have the highest incidence rates of prostate (225.0 per 100,000), colon and rectum (58.3 per 100,000), and lung and bronchus cancer (111.1 per 100,000). Black men are at least 50% more likely to develop prostate cancer than men of any other racial and ethnic group. Similar to American Indian women, American Indian men have consistently lower reported rates of cancer incidence than men of other racial and ethnic groups.

## Incidence and Mortality Rates\* by Site, Race, and Ethnicity, US, 1990-1997

Incidence	White	Black	Asian/Pacific Islander	American Indian	Hispanic†
All Sites					
Males	476.3	597.9	323.3	175.9	323.2
Females	352.4	337.4	246.9	137.3	240.9
Total	402.1	444.6	279.3	152.8	272.9
Breast (female)	114.0	100.2	74.6	33.4	68.9
Colon & rectum					
Males	52.7	58.3	47.2	20.4	35.7
Females	36.6	45.2	30.9	13.1	23.6
Total	43.6	50.7	38.1	16.3	28.8
Lung & bronchus					
Males	71.9	111.1	51.9	25.1	38.0
Females	43.3	45.8	22.5	13.3	19.4
Total	55.4	73.3	35.5	18.4	27.1
Prostate	145.8	225.0	80.4	45.8	101.6
Mortality	White	Black	Asian/Pacific Islander	American Indian	Hispanic†
All Sites					
Males	207.0	305.5	127.2	124.6	130.6
Females	139.1	167.7	83.0	90.0	85.6
Total	166.5	221.9	102.3	104.5	104.0
Breast (female)	25.3	31.4	11.2	12.1	15.1
Colon & rectum					
Males	21.3	27.7	13.1	11.6	13.1
Females	14.3	19.9	8.9	8.9	8.3
Total	17.2	23.0	10.8	10.1	10.3
Lung & bronchus					
Males	69.5	99.5	34.2	40.9	31.6
Females	34.0	33.0	14.9	19.8	11.0
Total	49.1	60.1	23.4	29.0	19.8
Prostate	23.3	54.1	10.4	14.2	16.2

\*Per 100,000, age-adjusted to the 1970 US standard population. †Hispanic is not mutually exclusive from white, black, Asian/Pacific Islanders, and American Indians.

**Note:** Incidence data are from the 11 SEER areas; mortality data are from all states, except data for Hispanics. Data for Hispanics include deaths that occurred in all states except Connecticut, Louisiana, New Hampshire, and Oklahoma.

**Source:** Surveillance, Epidemiology, and End Results Program, Division of Cancer Control and Population Science, National Cancer Institute, 2000. Mortality derived from data originating from the National Center for Health Statistics, Centers for Disease Control and Prevention, 2000.

American Cancer Society, Surveillance Research, 2001

Blacks are about 33% more likely to die of cancer than whites, and are more than twice as likely to die of cancer than Asian/Pacific Islanders, American Indians, and Hispanics. During 1990-1997, cancer mortality rates were 221.9 per 100,000 among blacks, 166.5 per 100,000 among whites, 104.0 per 100,000 among Hispanics, 102.3 per 100,000 among Asian/Pacific Islanders, and 104.5 per 100,000 among American Indians. Cancer mortality rates for many racial and ethnic groups have begun to decline recently. During 1990-1997, mortality rates decreased among whites (-0.7% per year), blacks (-1.0% per year), Hispanics (-0.9% per year), and Asian/Pacific Islanders (-0.8% per year); and increased slightly among American Indians (1.0 % per year).

Black women are more likely to die of breast (31.4 per 100,000) and colon and rectum cancer (19.9 per 100,000) than are women of any other racial and ethnic group. White and black women have similarly high

mortality rates of lung and bronchus cancer, compared with American Indian, Asian/Pacific Islander, and Hispanic women.

Black men have the highest mortality rates of colon and rectum (27.7 per 100,000), lung and bronchus (99.5 per 100,000), and prostate cancer (54.1 per 100,000). Black men are more than twice as likely to die of prostate cancer than men of other racial and ethnic groups.

Comparisons of cancer rates between racial and ethnic groups, particularly those involving groups other than whites or blacks, should be interpreted with caution because misclassification of race on medical records, death certificates, and the census can reduce the accuracy of reported rates. For more information about cancer in minority populations, ask about the American Cancer Society publication *Cancer Facts & Figures for African Americans* (8614.01).

## TOBACCO USE

Smoking is the most preventable cause of death in our society. During 1995, approximately 2 million people in developed countries died prematurely because of smoking.<sup>1</sup> Tobacco use is responsible for nearly one in five deaths in the United States.<sup>2</sup> Based on data from the American Cancer Society's Cancer Prevention Study II, it is estimated that 430,700 US deaths per year were attributable to smoking during 1990-1994.<sup>3</sup> Approximately half of all continuing smokers die from diseases caused by smoking.<sup>1</sup> Of these, approximately half die in middle age (35-69), losing an average of 20 to 25 years of life expectancy.<sup>1</sup>

Lung cancer mortality rates are more than 20 times higher for current male smokers and 12 times higher for current female smokers compared to lifelong never-smokers.<sup>4</sup> 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.<sup>4</sup> Smoking accounts for at least 30% of all cancer deaths, is a major cause of heart disease, cerebrovascular disease, chronic bronchitis, and emphysema, and is associated with such as gastric ulcers.<sup>4</sup>

### Trends in Smoking

- Cigarette smoking among adults aged 18 and over declined 40% between 1965 and 1990—from 42% to 25%. Smoking prevalence among adults, however, remained virtually unchanged between 1990 and 1998.<sup>5</sup>
- Between 1978 and 1995, cigarette smoking prevalence among men 18 years and older declined for whites (37% to 28%), blacks (45% to 31%), Hispanics (38%

to 23%), and Asian and Pacific Islanders (33% to 25%). Among American Indian and Alaska Native men, smoking prevalence did not change from 1983 to 1995.<sup>6</sup>

- Between 1978 and 1995, smoking prevalence among women 18 years and older declined for whites (31% to 24%), blacks (31% to 23%), Hispanics (23% to 15%), and Asian and Pacific Islanders (15% to 6%). Smoking prevalence among American Indian and Alaska Native women remained unchanged from 1978 to 1995.<sup>6</sup>
- Between 1983 and 1998, smoking among college graduates decreased almost one-half from 21% to 11%, but among adults without a high school education the percentage decreased only 17% from 41% to 34%.<sup>5</sup>
- Per capita consumption of cigarettes continues to decline. After peaking at 4,345 cigarettes per capita in 1963, consumption among Americans 18 years and older decreased 51% to an estimated 2,146 cigarettes per capita in 1999.<sup>7, 8</sup>
- From 1991 to 1999, current cigarette smoking among US high school students increased significantly from 28% in 1991 to 35% in 1999. However, a recent study suggests this increasing trend may have leveled or possibly begun to decline. In addition, current frequent cigarette smoking among US high school students increased significantly from 13% in 1991 to 17% in 1999.<sup>9</sup>
- In 1997, nearly one-half (48%) of male students and more than one-third (36%) of female students reported using some form of tobacco—cigarettes, cigars, or smokeless tobacco—in the past month.

The percentages for male students declined slightly to 44% and remained nearly the same (37%) for female students in 1999.<sup>10, 11</sup>

## Profile of Smokers

Over 80% of adult smokers surveyed in 1991 had begun smoking by age 18. In addition, 35% had become daily smokers by age 18.<sup>12</sup> Among adults in 1998, national data showed:<sup>13</sup>

- An estimated 47 million US adults (approximately 25 million men and 22 million women) were current smokers.
- Men were more likely to smoke (27%) than women (22%).
- Cigarette smoking was highest among American Indian and Alaska Natives (40%) and lowest among Asian and Pacific Islanders (14%).
- Male (40%) and female (34%) high school dropouts have higher percentages of cigarette smoking.

Among US high school students in 1999, national data showed:<sup>11</sup>

- One quarter (25%) of high school students smoked a whole cigarette before age 13.
- Nearly three-fourths (70%) of high school students have ever tried cigarette smoking.
- More than one-third (35%) of high school students were current cigarette smokers (smoked at least one cigarette in the past month); white (39%) and Hispanic (33%) students were more likely to be current cigarette smokers than black (20%) students.
- Seventeen percent of high school students smoked cigarettes on at least 20 of the 30 days preceding the survey; white (20%) students were more likely to be frequent cigarette smokers than Hispanic (10%) and black (7%) students.

## Smokeless Tobacco

In 1986, the US Surgeon General concluded that the use of smokeless tobacco is not a safe substitute for smoking cigarettes or cigars; causing various cancers and non-cancerous oral conditions, and can lead to nicotine addiction.<sup>14</sup>

- Oral cancer occurs several times more frequently among snuff dippers compared with non-tobacco users.<sup>14</sup>
- The risk of cancer of the cheek and gums may increase nearly 50-fold among long-term snuff users.<sup>14</sup>
- According to the US Department of Agriculture, US production of moist snuff has risen almost 50% in the past decade from 43 million pounds in 1989 to an estimated 63 million pounds in 1999.<sup>8, 15</sup>
- Nationwide, 14% of US male high school students currently used chewing tobacco or snuff in 1999.

In 1999, white male students (19%) were more likely to use smokeless tobacco than Hispanic (6%) and black (3%) male students.<sup>11</sup>

- Among adults aged 18 and older, national data showed 6% of men and 1% of women were current users of chewing tobacco or snuff. Among men, American Indian and Alaska Natives (8%) and whites (7%) were more likely than blacks (3%), Hispanics (2%), and Asian and Pacific Islanders (1%) to use smokeless tobacco.<sup>6</sup>

## Cigars

The consumption of large cigars and cigarillos has been increasing since 1993. An estimated 3.7 billion large cigars and cigarillos were expected to be consumed in 1999. Production increased from 1.5 billion pounds in 1997 to an estimated 2.2 billion pounds in 1999.<sup>8</sup>

- In 1998, the median percentage of adults aged 18 years and older who ever smoked cigars was 39%. States with the highest percentage included: Alaska (52%), Wisconsin (50%), Nevada (49%), Michigan (48%), and Oregon (47%). More men than women had ever smoked cigars in all 50 states.<sup>16</sup>
- In 1998, the median percentage of adults aged 18 years and older who have smoked cigars in the past month was 5%. States with the highest percentages included: Nevada, Indiana, Illinois, Michigan, and New Jersey. More men than women smoked cigars in the past month in all 50 states.<sup>16</sup>
- Nationwide, 18% of US high school students (Grades 9 to 12) had smoked cigars, cigarillos, or little cigars on at least 1 of the past 30 days. Male students (25%) were more likely than female students (10%) to smoke cigars currently. White male students (28%) were significantly more likely than black male students (16%) to report current cigar use.<sup>11</sup>
- Nationwide, 6% of US middle school students (Grades 6 to 8) had smoked cigars on at least 1 of the past 30 days; male students (8%) were more likely than female students (4%) to smoke cigars currently.<sup>17</sup>

Beginning in 2001, 7 major cigar manufacturers will provide 5 health warnings which will rotate on labels on cigars sold in the US. The companies agreed to this in June 2000 to settle a lawsuit brought by the Federal Trade Commission for failure to warn consumers of the dangers of cigar smoking. Cigar smoking has health consequences and hazards similar to those of cigarettes and smokeless tobacco such as:<sup>18</sup>

- Cancer of the lung, oral cavity, larynx, esophagus, and probably cancer of the pancreas.
- Four to ten times the risk of dying from laryngeal, oral, or esophageal cancers compared with nonsmokers.



## Smoking Cessation

In 1990, the US Surgeon General outlined the benefits of smoking cessation:<sup>19</sup>

- People who quit, regardless of age, live longer than people who continue to smoke.
- Smokers who quit before age 50 halve their 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.
- Quitting lowers the risk for other major diseases including coronary heart disease and cardiovascular disease.

Among adults 18 and older in 1998, national data showed:<sup>13</sup>

- About 39% of current every-day smokers attempted to quit for at least one day during the preceding 12 months because they wanted to stop smoking.
- About 23% of US adults (approximately 45 million adults: 26 million men and 19 million women) were former smokers.

Among adolescent smokers aged 12 to 19 years in 1989, approximately 16% had successfully quit smoking for 30 days in 1993.<sup>20</sup> In this study, successful quit attempts did not vary by age, gender, or ethnicity. Predictors of successful quitting include less frequent smoking, longer past quit attempts, personal beliefs about future smoking patterns, mother's smoking status, and lower depression score.<sup>20</sup>

A recent US Surgeon General's report on reducing tobacco use outlines the components of comprehensive tobacco control. Health education combined with social, economic, and regulatory approaches is essential to counterbalance the tobacco industry's advertising and promotion and to foster non-smoking environments.<sup>21</sup>

## Secondhand Smoke

Secondhand smoke, or environmental tobacco smoke (ETS), contains numerous human carcinogens for which there is no safe level of exposure. Scientific consensus groups have repeatedly reviewed the data on ETS. These include the US Environmental Protection Agency,<sup>22</sup> California Environmental Protection Agency,<sup>23</sup> and the National Institute of Environmental Sciences' National Toxicology Program.<sup>24</sup> Public policies to protect people from secondhand smoke are based on the following detrimental effects of ETS.

- Each year, about 3,000 nonsmoking adults die from lung cancer as a result of breathing secondhand smoke.<sup>22</sup>

- ETS causes an estimated 35,000 to 40,000 deaths from heart disease in people who are not current smokers.<sup>25</sup>
- ETS causes coughing, phlegm, chest discomfort, and reduced lung function in nonsmokers.<sup>22</sup>
- Each year, exposure to secondhand smoke causes 150,000 to 300,000 lower respiratory tract infections (such as pneumonia and bronchitis) in US children younger than 18 months of age. These infections result in 7,500 to 15,000 hospitalizations every year.<sup>22</sup>
- Secondhand smoke increases the number of asthma attacks and the severity of asthma in about 200,000 to 1 million asthmatic children.<sup>22</sup>
- Secondhand smoke contains over 4,000 substances, more than 40 of which are known or suspected to cause cancer in humans and animals and many of which are strong irritants.<sup>22</sup>

## Worldwide Tobacco Use

While smoking rates are slowly declining in the United States and most other high-income countries, they have been steadily growing in developing nations. According to the World Health Organization:<sup>26</sup>

- Based on current smoking patterns, smoking eventually will kill about 500 million people alive in the world today.
- Tobacco-caused deaths are expected to increase from about 4 million per year today to about 10 million per year by the 2030s, with 70% of those deaths occurring in developing nations. This is a higher death toll than is expected from malaria, maternal and major childhood conditions, and tuberculosis combined.
- Smoking is increasing in developing nations at a rate of about 3.4% per year.
- Prevalence rates among men in developing countries are about 48%; rates among women are substantially lower but increasing.
- The estimated 1.2 billion smokers in the world today consume an average 14 cigarettes per day.

## Costs of Tobacco

Tobacco costs to our society are best measured by the number of people who die or suffer illness each year because of its use. Annual medical costs of smoking constitute 6% to 8% of American personal health expenses, but may be as high as 12%.<sup>27</sup> One study showed health care expenditures caused directly by smoking totaled \$50 billion and 43% of these costs were paid by government funds, including Medicaid and Medicare in 1993.<sup>28</sup>

These estimates of medical and other costs from tobacco may be low since costs associated with diseases caused by environmental tobacco smoke, burns from tobacco-related fires, or perinatal care for low-birthweight infants

of mothers who smoke<sup>28</sup> and indirect costs, such as work loss, bed-disability days, and loss in productivity, were not included.<sup>28</sup> As a result, the total economic burden of cigarette smoking may be more than \$100 billion.<sup>28</sup> A recent study showed total US medical expenditures attributable to smoking was an estimated \$54 billion in 1993 with \$12 billion in ambulatory care, \$3 billion in prescription drugs, \$16 billion in hospital care, and \$15 billion in nursing homes, which translates to \$279 in health care costs per adult.<sup>29</sup> The impact of cigarette smoking on state Medicaid and Medicare budgets varies among states, ranging from \$1.9 billion in New York to \$11.4 million in Wyoming for Medicaid and \$1.5 billion in California to \$8 million in Alaska for Medicare.<sup>30, 31</sup>

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# NUTRITION AND DIET

Scientific evidence suggests that about one-third of the cancer deaths that occur in the US each year are due to nutrition factors, including obesity. For most 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 inherited genes do influence cancer risk, heredity alone explains only a fraction of all cancer. 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 healthy diet and exercise practices at any time from childhood to old age can promote health and may 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 updated its nutrition guidelines in 1999. The Society's recommendations are consistent in principle with the 1992 US Department of Agriculture (USDA) Food Guide Pyramid, the 2000 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 against 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, which have been associated with a lower risk of colon

cancer in some studies. 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 the colon and rectum, prostate, and endometrium. The association between high-fat diets and the risk of breast cancer is weak. Whether risk is influenced by 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 being overweight, and to increased risk for cancers at several sites: colon and rectum, prostate, endometrium, breast (after menopause), 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. Regardless of the mechanism, studies show that the risk of breast cancer increases with an intake beginning at just a few drinks per week. Reducing alcohol consumption is a good way for women who drink regularly to reduce their risk of breast cancer.

# ENVIRONMENTAL CANCER RISKS

Environmental factors, defined broadly to include smoking, diet, and infectious diseases as well as chemicals and radiation, cause an estimated three-quarters of all cancer deaths in the United States. Among these factors, tobacco use, unhealthy diet, and physical inactivity are more likely to affect personal cancer risk than trace levels of pollutants in food, drinking water, and air. However, the degree of risk from these pollutants depends on the concentration, intensity, and duration of exposure. Substantial increases in risk have been shown in settings where workers have been exposed to high concentrations of ionizing radiation, certain chemicals, metals, and other substances, as well as among radiation victims, and patients treated with drugs or therapies later found to be carcinogenic.

Even low-dose exposures that pose only small risk to individuals can still cause substantial ill health across an entire population if the exposures are widespread. For example, secondhand tobacco smoke increases risk in large numbers of people who do not smoke but are exposed to others' smoke. Strong regulatory control and attention to safe occupational practices, drug testing, and consumer product safety play an important role in reducing risk of cancer from environmental exposures. Additional information on environmental factors associated with cancer risks can be found at several web sites, including [www.atsdr.cdc.gov](http://www.atsdr.cdc.gov), [www.epa.gov](http://www.epa.gov), [www.niehs.nih.gov](http://www.niehs.nih.gov), [www.osha.gov](http://www.osha.gov), and [www.who.int](http://www.who.int).

## Risk Assessment

The risk assessment process evaluates both the cancer-causing potential of a substance as well as the levels of the substance in the environment and the extent to which people are actually exposed. However, the process is not perfect. For most potential carcinogens, data are only available from high dose experiments in animals or highly exposed occupational groups. To use such information to set human safety standards, regulators must extrapolate from animals to humans and from high-dose to low-dose conditions. Because both extrapolations involve much uncertainty, as does the effect of mixtures of chemicals and of especially susceptible subgroups of the population, risk assessment generally makes conservative assumptions to err on the side of safety. For cancer safety standards, acceptable risks are usually limited to those that increase risk by no more than one case per million persons over a lifetime.

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 causing cancer in humans; others are considered probable human carcinogens based on evidence from animal experiments (for example, chloroform, dichlorodiphenyl-trichloroethane [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

The only types of radiation proven to cause human cancer are high-frequency ionizing radiation (IR) and ultraviolet (UV) radiation. 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 pollution (the "ozone hole") may cause 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, such as 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 and medical usefulness. Radon exposures in homes can increase lung cancer risk, and cigarette smoking greatly increases the effect of radon exposure in lung cancer risk. Fortunately there are tests which can be used to detect high levels of radon. Remedial actions may be needed if radon levels are too high.

## Unproven Risks

Public concern about cancer risks in the environment often focuses on unproven risks or on situations in which 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 agriculture in the production of the food supply. High doses of some of these chemicals have been shown to cause cancer in animals, but the very low concentrations found in some foods have not been associated with increased cancer risk. In fact, people who eat more fruits and vegetables, which may be contaminated with trace amounts of pesticides, generally have lower cancer risks than people who eat few fruits and vegetables. Workers exposed to high levels of pesticides, in industry or farming, may be at higher risk of certain cancers. Environmental pollution by pesticides such as DDT, which is now banned but was used in agriculture in the past, degrades slowly and can lead to accumulation in the food chain and persistent residues in body fat. These residues have been suggested as a possible risk factor for breast cancer, although the evidence has not been conclusive.

Continued research regarding pesticide use is essential for maximum food safety, but pesticides play a valuable role in sustaining the food supply. When controlled properly, the minimal risks they pose are 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 proven to cause cancer. Some studies suggest it is associated with cancer, but most of the now extensive research in this area does not. 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, cellular phones, and household appliances.

**Toxic wastes.** Toxic wastes in dump sites can threaten human health through air, water, and soil pollution. Many toxic chemicals contained in such wastes can be carcinogenic at high doses, but 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.

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

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

<b>Cancer-related Checkup</b>	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.
<b>Breast</b>	Women 40 and older should have an annual mammogram, an annual clinical breast examination (CBE) by a health care professional, and should perform monthly breast self-examination (BSE). The CBE should be conducted close to and preferably before the scheduled mammogram. Women aged 20-39 should have a clinical breast examination by a health care professional every three years and should perform monthly BSE (see page 10).
<b>Colon &amp; Rectum</b>	Beginning at age 50, men and women at average risk should follow one of the examination schedules below: 1) Fecal occult blood test (FOBT) every year, or 2) Flexible sigmoidoscopy every 5 years,* or 3) FOBT every year and flexible sigmoidoscopy every 5 years,* (of these 3 options, the American Cancer Society prefers option 3, annual FOBT and flexible sigmoidoscopy every 5 years) or 4) Double-contrast barium enema every 5 years,* or 5) Colonoscopy every 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 increased or high risk for colorectal cancer should talk with a doctor about a different testing schedule (see page 12).
<b>Prostate</b>	Beginning at age 50, the prostate-specific antigen (PSA) test and the digital rectal exam should be offered annually to men who have a life expectancy of at least 10 years. Men at high risk (African-American men and men who have a first-degree relative who was diagnosed with prostate cancer at a young age) should begin testing at age 45. Patients should be given information about the benefits and limitations of tests so they can make an informed decision (see page 16).
<b>Uterus</b>	<b>Cervix:</b> 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. <b>Endometrium:</b> Beginning at age 35, women with or at risk for hereditary non-polyposis colon cancer should be offered endometrial biopsy annually to screen for endometrial cancer (see page 19).

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# 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 about the symptoms, treatment, and prevention of cancer; to investigate conditions under which cancer was found; and to compile statistics about cancer. Later renamed the American Cancer Society, Inc., the organization now consists of more than 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 approximately 3,400 Units.

**The National Society:** A National Assembly provides basic representation from the Divisions and additional representation on the basis of population. The Assembly elects a volunteer Board of Directors, establishes organizational goals, ensures management accountability, and provides stewardship of donated funds. The National Society is responsible for overall planning and coordination of the Society's cancer control activities in prevention, detection, and the enhancement of the quality of life of cancer patients and their families. The National Society also provides technical help and materials for Divisions and Units, and administers 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 deliver cancer control programs in communities throughout the United States. They are led by thousands of local volunteers who direct the activities and programs of the Society at the community level. Descriptions of some of the Society's major programs follow.

## ADVOCACY & PUBLIC POLICY

Cancer is a political, as well as a medical, social, psychological, and economic issue. Every day, legislators make decisions that impact the lives of millions of Americans who have been touched by cancer. To affect those decisions positively, the Society has identified advocacy as part of its mission and as one of its top corporate priorities and works nationwide to promote beneficial policies, laws, and regulations for those affected by cancer.

### Advocacy Priorities

Cancer is a personal, tangible, and powerful issue for millions of Americans and they want our political leaders to fight the disease with a broad-based approach.

In concert with its cancer research, education, prevention, and cancer control initiatives, the Society's advocacy initiatives strive to influence public policies with special emphasis on laws or regulations to:

- Increase investments for cancer research, prevention, early detection, and care;
- Increase access to quality cancer care, screening, prevention, and awareness efforts
- Reduce health disparities among minorities and the medically underserved; and,
- Reduce and prevent suffering from tobacco-related illness.

The American Cancer Society has identified areas where federal, state, and local government leaders can allocate additional resources to help reduce the number of individuals being diagnosed with and dying from cancer. These steps begin with cancer prevention, early detection, treatment, and research. More resources should be allocated to prevent cancer as scientific advances allow and as capacity for prevention increases. More funding is needed to answer the public's call for an increased investment in research to further today's knowledge to the next level of cancer breakthroughs. Complementing this, policymakers also should fund efforts to apply research findings so that what is learned at the laboratory bench reaches the bedside. Urging legislative bodies to fund these efforts moves everyone that much closer to our ultimate goal—to defeat cancer.

The American Cancer Society also calls on policy makers to increase access to quality cancer care, screening, prevention and awareness programs. Local, state, and federal government leaders have the tools to help stem the tide on cancer. They can help remove financial, insurance, and other barriers that impede access to important cancer fighting tools—such as access to cancer screenings and clinical trials. Moreover, policy makers can bring awareness to important health issues and are able to act to improve the quality of life for all people touched by cancer. A recent study has shown that Americans understand the importance of these efforts and want their public leaders to increase access to health care for the uninsured and provide more public health programs to prevent disease.

Reducing health disparities among minorities and the medically underserved remains a top priority for the American Cancer Society. We cannot begin to reduce cancer incidence and mortality without making inroads into ethnic minority and medically underserved communities that are disproportionately affected by cancer.

These communities include racially and culturally diverse Americans who share characteristics associated with lower levels of income and educational attainment, as well as persons with inadequate medical insurance and individuals who experience barriers because of illiteracy or differing cultural beliefs, practices, and languages. These populations are more likely to develop and die of cancer than other groups. Policy makers at the local, state, and federal level must provide adequate resources for culturally competent programs that work to reduce and eliminate the unequal burden of cancer, remove barriers that impede access to cancer care and prevention, and improve general access to health care for those communities at greatest risk for cancer.

The American Cancer Society is firmly committed to reducing and preventing suffering from tobacco related illness. The Supreme Court recently asserted that tobacco use, particularly among children and adolescents, “poses perhaps the single most significant threat to the public health in the United States.” (FDA v. Brown & Williamson). Policy makers—at all levels of government—should pass meaningful regulation over tobacco-related products; increase the tax on tobacco to reduce consumption; restrict Internet sales of tobacco to kids; provide funding for comprehensive and coordinated tobacco control efforts, and hold the tobacco industry accountable for reducing tobacco use among kids by charging an assessment fee for every underage smoker.

### **Advocacy Successes**

American Cancer Society advocacy initiatives rely on the combined efforts of a community-based grassroots network of Society volunteers, health care professionals, cancer survivors, and other partners. In the past year, the American Cancer Society—through its local, state, and federal efforts—has successfully influenced or supported policies, laws, and regulations to:

- Increase investments in cancer research at the National Institutes of Health and the National Cancer Institute;
- Apply the knowledge gained from research by increasing funding for critical cancer-related programs provided through the Centers for Disease Control and Prevention;
- Ensure access to clinical trials through Medicare and private health insurance at the state level;
- Advance state and federal legislation that eliminates barriers to effective cancer screening tests;
- Support and expand local, state, and federal programs that increase awareness and prevention of cancer;
- Ensure resources for culturally effective programs that address the unequal burden of cancer and improve access to cancer prevention, early detection, and treatment for medically underserved communities;

- Advance state and local measures that reduce tobacco consumption, ensure minors do not access tobacco products, and restrict smoking in public places
- Secure funding through the state-tobacco settlement agreement for comprehensive tobacco control programs at the local and state level.

## **CANCER INFORMATION**

Providing the public with accurate, up-to-date information on cancer is a priority for the American Cancer Society. The Society provides information on all aspects of cancer through published materials, a toll-free information line, and a web site.

### **National Cancer Information Center 1-800-ACS-2345**

People facing cancer need clear, reliable information in order to understand their disease and make informed decisions about their health. Trained cancer information specialists are available 24 hours a day, seven days a week to answer questions about cancer, link callers with resources in their communities, and provide information on local events. Callers who speak languages other than English and Spanish can also be assisted. The National Cancer Information Center includes an email response center staffed by cancer information specialists who respond to questions and comments submitted through the Society’s web site.

### **American Cancer Society Web Site [www.cancer.org](http://www.cancer.org)**

The American Cancer Society’s web site is an important extension of the Society’s mission to provide lifesaving information to the public. The user-friendly site includes an interactive cancer resource center containing in-depth information on every major cancer type; information is also available in Spanish. Through the resource center, visitors can order American Cancer Society publications, gain access to recent news articles, and find additional on- and off-line resources. Other useful sections on the web site include a directory of medical resources, links to other sites organized by cancer type or topic, resources for media representatives, and information on the Society’s research grants program, advocacy efforts, and special events.

### **Publications**

The Society publishes a large number of patient education brochures and pamphlets, books, and professional journals for patients, families, and health care professionals. These include books on specific cancer types, coping issues, and prevention; cookbooks; and textbooks and other specialized cancer-related topics for

health care professionals. Four clinical journals (*Cancer*, *Cancer Cytopathology*, *CA—A Cancer Journal for Clinicians*, and *Cancer Practice*) are also available. For more information, call 1-800-ACS-2345 or visit our online bookstore at [www.cancer.org](http://www.cancer.org).

## COMMUNITY CANCER CONTROL

Community cancer control encompasses 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, promoting coordinated school health, 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.

Specific programs that the Society has developed to strengthen the schools' ability to teach cancer prevention include conducting a National School Health Coordinator Leadership Institute, creation of a series of social marketing campaigns on the benefits of school health, and coordinating the development of a Healthy Kids Network of parents and community members in support of school health and cancer prevention.

The American Cancer Society works collaboratively with our national partners to implement comprehensive

tobacco control programs. The Society advocates for social environmental change at the national, state, and community level that prevents youth from starting to use tobacco and provides support for those who wish to stop smoking. Tobacco control efforts include:

- FDA regulation of all tobacco products
- Reducing tobacco advertising and promotion directed at youth
- Increased funding to support comprehensive tobacco control programs
- Reducing environmental tobacco smoke exposure
- Support for coordinated school-based education programs
- Accessible cessation programs for those who wish to quit
- Tobacco tax increases to offset health care costs associated with tobacco use
- Support for a global partnership to reduce tobacco-related death and disease

The Society promotes its skin protection message through a variety of media and education activities, as well as through the 33-member organizations of the American Cancer Society Skin Protection Federation. This coalition includes non-profit organizations, government agencies, and corporations that have a combined constituency of over 100 million adults and children. The purpose of the coalition is to accelerate promotion of the American Cancer Society's guidelines for skin cancer prevention, and to provide a forum for member organizations to share information and strategies that increase awareness about skin protection and encourage more people to adopt skin protection behaviors.

With possibly over 60% of cancers preventable and due to lifestyle behaviors like smoking, sun exposure, and poor diet that often begin in childhood, children and youth are an important audience for cancer prevention. The Society, together with the Centers for Disease Control and Prevention (CDC), and a host of other education, health, and social service agencies, has identified schools as a key system for impacting cancer prevention. By strengthening the 15,000 school districts in the US and helping them to deliver strong coordinated school health programs and effective school health education, the American Cancer Society has the ability to impact over 45 million school children.

### Detection and Treatment

The Society also seeks, through the dissemination of its early cancer detection guidelines and its cancer detection and advocacy programs, to ensure that cancer is diagnosed at the earliest possible stage when there is the greatest chance of successful treatment. American



Cancer Society guidelines for early cancer detection are reviewed annually to ensure that recommendations to the public and health care providers are based on the most current scientific evidence. Currently, the Society has early detection recommendations for cancers of the breast, cervix, colon and rectum, prostate, and endometrium, and general recommendations for a cancer-related checkup (for more information, see Summary of American Cancer Society Recommendations for the Early Detection of Cancer in Asymptomatic People). The Society works in partnership with many public and private sector organizations in diverse settings to increase awareness about breast cancer, the importance of early detection, and to overcome the barriers to regular mammography use.

The Society, in partnership with the CDC, is leading a national initiative to increase colorectal cancer screening, which is currently underutilized by adults. In addition to public outreach campaigns and initiatives targeting health care providers, the ACS and CDC have established the National Colorectal Cancer Roundtable, bringing leading government agencies, professional and medical organizations, and advocacy and patient groups together to identify collective strategies and opportunities to increase screening for colorectal 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 about the use 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

The Society offers a range of practical and emotional support for patients, their families, their caregivers, and their community from the time of diagnosis throughout life:

### *Reach to Recovery:*

- Reach to Recovery is an American Cancer Society program designed to help people cope with their breast cancer experience.
- This program has provided more than 30 years of service, in the fight against breast cancer.
- Reach to Recovery volunteers are breast cancer survivors who are trained to offer support at various

points along the breast cancer continuum: diagnosis; decision making about treatment; dealing with treatment and its side effects; returning to a full, active life; or confronting any long-term effects—including a possible recurrence of the disease.

*“tlc”:* A service offering of the Society, “tlc” 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 that focus on medical questions specific to breast cancer, and also has a Question & Answer section. “Tlc” features a variety of hats, honeys, caps, turbans, hair-pieces, 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 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 for 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.

*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; 17 lodges are in operation.

*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 challenges of a cancer diagnosis.

## 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 1999, the Society invested over \$100 million in research. To date, the Society has invested more than \$2.2 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 that ensures that only the highest quality applications receive funding. The success of the Society's research program is exemplified by the fact that 30 Nobel Prize winners received grant support from the Society early in their careers.

### **Epidemiology and Surveillance Research**

Intramural epidemiologic research at the Society evaluates trends in cancer incidence and mortality, cancer risk factors, and cancer patient care, and studies the causes and prevention of cancer in large prospective studies. In addition to *Cancer Facts & Figures*, the department provides descriptive cancer statistics in several other publications including *Cancer Statistics*, *Breast Cancer Facts & Figures*, and *Cancer Facts & Figures for African Americans*. Trends and patterns in cancer risk factors such as tobacco use, nutrition, and physical activity are presented in *Cancer Prevention and Early Detection Facts & Figures*. This publication serves as a resource for ACS Divisions to assess progress toward the Society's goals. For the past three years, the department has collaborated with the National Cancer Institute, the Centers for Disease Control and Prevention, including the National Center for Health Statistics, and the North American Association of Central Cancer Registries to produce the annual Report to the Nation on progress related to cancer prevention and control in the United States.

The department also analyzes patterns of cancer causation in large prospective studies. Three such studies have been undertaken over the past 50 years:

- Hammond-Horn (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)

About 100 scientific publications based on CPS-II have examined the contribution of lifestyle (smoking, nutrition, weight, etc.,) family history, illnesses, medications, and environmental exposures to various cancers.

Mortality follow-up of all CPS II cohort members remains active. In addition, cancer incidence follow-up and periodic updating of exposure information occurs in the CPS II Nutrition Cohort, a subgroup of 184,000 men and women.

In 1998, the CPS II Lifelink Cohort was established to obtain blood samples from 40,000 to 50,000 surviving members of the CPS II Nutrition Cohort residing in urban and suburban areas. These blood samples are being stored in liquid nitrogen for future epidemiologic investigations, including the role of nutritional, hormonal, and genetic factors in the development of cancer and other diseases. Additional information about the Cancer Prevention Studies is available at [www.cancer.org](http://www.cancer.org), including copies of questionnaires and publication citations.

### **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 facilitate the transfer of behavioral and psychosocial research and theory to improve cancer control policies. Among the ongoing research projects of the Center are:

- 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, to evaluate programs intended to meet their needs, and to examine late effects including second cancers.
- A cross-sectional study of 2-, 5-, and 10-year cancer survivors to evaluate their psychological needs, adjustment, and quality of life.
- A study of the knowledge, attitudes, and behaviors of a managed-care population regarding colorectal cancer screening.
- A longitudinal study of the use of stage-based smoking cessation materials implemented in conjunction with the Society's Cancer Control Department and the National Cancer Information Center.
- A series of studies of the risk perceptions and behavioral characteristics of cigar smokers to better understand the increase in US cigar smoking.

# SOURCES OF STATISTICS

**Cancer Deaths.** The estimated numbers of US cancer deaths are calculated by fitting the numbers of cancer deaths for 1979 through 1998 to a statistical model which forecasts the numbers of deaths that are expected to occur in 2001. 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 for 1973 through 1998 and population data from the US Bureau of the Census. Unless otherwise indicated, death rates in this publication are age-adjusted to the 1970 US standard population, to allow comparisons across populations with different age distributions.

**New Cancer Cases.** The estimated numbers of new US cancer cases are calculated by estimating the numbers of cancer cases that occurred each year from 1979 through 1997 and fitting these estimates to a statistical model which forecasts the numbers of cases that are expected to occur in 2001. Estimates of the numbers of cancer cases for 1979 through 1997 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 1997 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 are calculated by apportioning the total US case estimates for 2001 by state, based on the state distribution of estimated cancer deaths for 2001.

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 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. State incidence rates presented in this publication were originally published in the North American Association of Central Cancer Registries' publication *Cancer Incidence in North America, 1993-1997*. Incidence rates for the United States were originally published in *SEER Cancer Statistics Review, 1973-1997*. Unless otherwise indicated, incidence rates in this publication are age-adjusted to the 1970 US standard population, to allow comparisons across populations that have different age distributions.

**Survival.** Five-year relative survival rates are presented in this report for cancer patients diagnosed through 1996 and followed through 1997. Relative survival rates are used 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 observed 5-year survival rates for cancer patients by 5-year survival rates expected 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 *SEER Cancer Statistics Review, 1973-1997*.

**Probability of Developing Cancer.** Probabilities of developing cancer are calculated using DEVCAN (Probability of DEveloping CANcer Software) developed by the National Cancer Institute. 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 estimate of 1 man in 12 developing lung cancer in their lifetime is a low estimate for smokers and a high estimate for nonsmokers.

**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, 1998, Vol II, Mortality, Part A*. Washington: Public Health Service. 2000, or visit the NCHS web site at [www.cdc.gov/nchs](http://www.cdc.gov/nchs).
- B. For information on data collection methods used by the National Cancer Institute's Surveillance, Epidemiology and End Results Program: Ries LAG, Eisner MP, Kosary CL, et al. (eds.). *SEER Cancer Statistic Review, 1973-1997*. National Cancer Institute. Bethesda, MD, 2000 or visit the SEER web site at [www-seer.ims.nci.nih.gov](http://www-seer.ims.nci.nih.gov).
- C. For information on the methods used to estimate the numbers of new cancer cases and deaths: Wingo PA, Landis S, Parker S, Bolden S, Heath CW. Using cancer registry and vital statistics data to estimate the number of new cancer cases and deaths in the United States for the upcoming year. *J Reg Management* 1998;25(2):43-51.
- 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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**For more information call toll free: 1-800-ACS-2345  
or on the Internet, [www.cancer.org](http://www.cancer.org)**