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**Cancer Statistics, 2010**

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# Cancer Statistics, 2010

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## Abstract

Each year, the American Cancer Society estimates the number of new cancer cases and deaths expected in the United States in the current year and compiles the most recent data regarding cancer incidence, mortality, and survival based on incidence data from the National Cancer Institute, the Centers for Disease Control and Prevention, and the North American Association of Central Cancer Registries and mortality data from the National Center for Health Statistics. Incidence and death rates are age-standardized to the 2000 US standard million population. A total of 1,529,560 new cancer cases and 569,490 deaths from cancer are projected to occur in the United States in 2010. Overall cancer incidence rates decreased in the most recent time period in both men (1.3% per year from 2000 to 2006) and women (0.5% per year from 1998 to 2006), largely due to decreases in the 3 major cancer sites in men (lung, prostate, and colon and rectum [colorectum]) and 2 major cancer sites in women (breast and colorectum). This decrease occurred in all racial/ethnic groups in both men and women with the exception of American Indian/Alaska Native women, in whom rates were stable. Among men, death rates for all races combined decreased by 21.0% between 1990 and 2006, with decreases in lung, prostate, and colorectal cancer rates accounting for nearly 80% of the total decrease. Among women, overall cancer death rates between 1991 and 2006 decreased by 12.3%, with decreases in breast and colorectal cancer rates accounting for 60% of the total decrease. The reduction in the overall cancer death rates translates to the avoidance of approximately 767,000 deaths from cancer over the 16-year period. This report also examines cancer incidence, mortality, and survival by site, sex, race/ethnicity, geographic area, and calendar year. Although progress has been made in reducing incidence and mortality rates and improving survival, cancer still accounts for more deaths than heart disease in persons younger than 85 years. Further progress can be accelerated by applying existing cancer control knowledge across all segments of the population and by supporting new discoveries in cancer prevention, early detection, and treatment. **CA Cancer J Clin 2010;60:277-300. ©2010 American Cancer Society, Inc.**

## Introduction

Cancer is a major public health problem in the United States and many other parts of the world. Currently, 1 in 4 deaths in the United States is due to cancer. In this article, we provide an overview of cancer statistics, including updated incidence, mortality, and survival rates, and expected numbers of new cancer cases and deaths in 2010.

## Materials and Methods

### Data Sources

Mortality data from 1930 to 2007 in the United States were obtained from the National Center for Health Statistics (NCHS).<sup>1</sup> Incidence data for long-term trends (1975-2006), 5-year relative survival rates, and lifetime probability of developing cancer were obtained from the Surveillance, Epidemiology, and End Results (SEER) program of the

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**DISCLOSURES:** The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention. The authors report no conflicts of interest.

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TABLE 1. Estimated New Cancer Cases and Deaths by Sex, United States, 2010\*

	ESTIMATED NEW CASES			ESTIMATED DEATHS		
	BOTH SEXES	MALE	FEMALE	BOTH SEXES	MALE	FEMALE
<b>All Sites</b>	<b>1,529,560</b>	<b>789,620</b>	<b>739,940</b>	<b>569,490</b>	<b>299,200</b>	<b>270,290</b>
<b>Oral cavity &amp; pharynx</b>	<b>36,540</b>	<b>25,420</b>	<b>11,120</b>	<b>7,880</b>	<b>5,430</b>	<b>2,450</b>
Tongue	10,990	7,690	3,300	1,990	1,300	690
Mouth	10,840	6,430	4,410	1,830	1,140	690
Pharynx	12,660	9,880	2,780	2,410	1,730	680
Other oral cavity	2,050	1,420	630	1,650	1,260	390
<b>Digestive system</b>	<b>274,330</b>	<b>148,540</b>	<b>125,790</b>	<b>139,580</b>	<b>79,010</b>	<b>60,570</b>
Esophagus	16,640	13,130	3,510	14,500	11,650	2,850
Stomach	21,000	12,730	8,270	10,570	6,350	4,220
Small intestine	6,960	3,680	3,280	1,100	610	490
Colon†	102,900	49,470	53,430	51,370	26,580	24,790
Rectum	39,670	22,620	17,050			
Anus, anal canal, & anorectum	5,260	2,000	3,260	720	280	440
Liver & intrahepatic bile duct	24,120	17,430	6,690	18,910	12,720	6,190
Gallbladder & other biliary	9,760	4,450	5,310	3,320	1,240	2,080
Pancreas	43,140	21,370	21,770	36,800	18,770	18,030
Other digestive organs	4,880	1,660	3,220	2,290	810	1,480
<b>Respiratory system</b>	<b>240,610</b>	<b>130,600</b>	<b>110,010</b>	<b>161,670</b>	<b>89,550</b>	<b>72,120</b>
Larynx	12,720	10,110	2,610	3,600	2,870	730
Lung & bronchus	222,520	116,750	105,770	157,300	86,220	71,080
Other respiratory organs	5,370	3,740	1,630	770	460	310
<b>Bones &amp; joints</b>	<b>2,650</b>	<b>1,530</b>	<b>1,120</b>	<b>1,460</b>	<b>830</b>	<b>630</b>
<b>Soft tissue (including heart)</b>	<b>10,520</b>	<b>5,680</b>	<b>4,840</b>	<b>3,920</b>	<b>2,020</b>	<b>1,900</b>
<b>Skin (excluding basal &amp; squamous)</b>	<b>74,010</b>	<b>42,610</b>	<b>31,400</b>	<b>11,790</b>	<b>7,910</b>	<b>3,880</b>
Melanoma-skin	68,130	38,870	29,260	8,700	5,670	3,030
Other nonepithelial skin	5,880	3,740	2,140	3,090	2,240	850
<b>Breast</b>	<b>209,060</b>	<b>1,970</b>	<b>207,090</b>	<b>40,230</b>	<b>390</b>	<b>39,840</b>
<b>Genital system</b>	<b>311,210</b>	<b>227,460</b>	<b>83,750</b>	<b>60,420</b>	<b>32,710</b>	<b>27,710</b>
Uterine cervix	12,200		12,200	4,210		4,210
Uterine corpus	43,470		43,470	7,950		7,950
Ovary	21,880		21,880	13,850		13,850
Vulva	3,900		3,900	920		920
Vagina & other genital, female	2,300		2,300	780		780
Prostate	217,730	217,730		32,050	32,050	
Testis	8,480	8,480		350	350	
Penis & other genital, male	1,250	1,250		310	310	
<b>Urinary system</b>	<b>131,260</b>	<b>89,620</b>	<b>41,640</b>	<b>28,550</b>	<b>19,110</b>	<b>9,440</b>
Urinary bladder	70,530	52,760	17,770	14,680	10,410	4,270
Kidney & renal pelvis	58,240	35,370	22,870	13,040	8,210	4,830
Ureter & other urinary organs	2,490	1,490	1,000	830	490	340
<b>Eye &amp; orbit</b>	<b>2,480</b>	<b>1,240</b>	<b>1,240</b>	<b>230</b>	<b>120</b>	<b>110</b>
<b>Brain &amp; other nervous system</b>	<b>22,020</b>	<b>11,980</b>	<b>10,040</b>	<b>13,140</b>	<b>7,420</b>	<b>5,720</b>
<b>Endocrine system</b>	<b>46,930</b>	<b>11,890</b>	<b>35,040</b>	<b>2,570</b>	<b>1,140</b>	<b>1,430</b>
Thyroid	44,670	10,740	33,930	1,690	730	960
Other endocrine	2,260	1,150	1,110	880	410	470
<b>Lymphoma</b>	<b>74,030</b>	<b>40,050</b>	<b>33,980</b>	<b>21,530</b>	<b>11,450</b>	<b>10,080</b>
Hodgkin lymphoma	8,490	4,670	3,820	1,320	740	580
Non-Hodgkin lymphoma	65,540	35,380	30,160	20,210	10,710	9,500
<b>Myeloma</b>	<b>20,180</b>	<b>11,170</b>	<b>9,010</b>	<b>10,650</b>	<b>5,760</b>	<b>4,890</b>
<b>Leukemia</b>	<b>43,050</b>	<b>24,690</b>	<b>18,360</b>	<b>21,840</b>	<b>12,660</b>	<b>9,180</b>
Acute lymphocytic leukemia	5,330	3,150	2,180	1,420	790	630
Chronic lymphocytic leukemia	14,990	8,870	6,120	4,390	2,650	1,740
Acute myeloid leukemia	12,330	6,590	5,740	8,950	5,280	3,670
Chronic myeloid leukemia	4,870	2,800	2,070	440	190	250
Other leukemia‡	5,530	3,280	2,250	6,640	3,750	2,890
<b>Other &amp; unspecified primary sites†</b>	<b>30,680</b>	<b>15,170</b>	<b>15,510</b>	<b>44,030</b>	<b>23,690</b>	<b>20,340</b>

\*Rounded to the nearest 10; estimated new cases exclude basal and squamous cell skin cancers and in situ carcinomas except urinary bladder.

About 54,010 female carcinoma in situ of the breast and 46,770 melanoma in situ will be newly diagnosed in 2010.

†Estimated deaths for colon and rectum cancers are combined.

‡More deaths than cases may reflect lack of specificity in recording underlying cause of death on death certificates or an undercount in the case estimate.

Source: Estimated new cases are based on 1995-2006 incidence rates from 41 states and the District of Columbia as reported by the North American Association of Central Cancer Registries (NAACCR), based on data collected by cancer registries participating in NCI's SEER program and CDC's National Program of Cancer Registries, representing about 89% of the US population. Estimated deaths are based on US Mortality Data, 1969 to 2007, National Center for Health Statistics, Centers for Disease Control and Prevention.

**TABLE 2. Age-standardized Incidence Rates for All Cancers Combined, 2002-2006, and Estimated New Cases\* for Selected Cancers by State, United States, 2010**

STATE	INCIDENCE RATE†	ALL CASES	FEMALE BREAST	UTERINE CERVIX	COLON & RECTUM	UTERINE CORPUS	LEUKEMIA	LUNG & BRONCHUS	MELANOMA OF THE SKIN	NON-HODGKIN LYMPHOMA	PROSTATE	URINARY BLADDER
Alabama	453.6	23,640	3,450	200	2,300	520	560	4,160	1,210	940	3,300	920
Alaska	468.3	2,860	410	‡	260	70	70	360	80	130	440	140
Arizona	§	29,780	3,950	210	2,620	710	760	4,030	1,430	1,210	3,850	1,530
Arkansas	459.3	15,320	1,770	140	1,500	330	420	2,620	460	640	2,330	610
California	441.0	157,320	21,130	1,540	13,950	4,470	4,460	18,490	8,030	7,010	22,640	6,620
Colorado	438.1	21,340	3,100	150	1,770	570	650	2,270	1,180	920	3,430	960
Connecticut	509.4	20,750	2,960	120	1,770	650	510	2,640	1,090	860	2,940	1,110
Delaware	511.9	4,890	690	‡	440	140	120	800	210	200	710	250
Dist. of Columbia	§	2,760	390	‡	260	80	60	360	70	100	450	90
Florida	462.4	107,000	14,080	940	10,500	2,710	3,330	18,390	4,980	4,660	14,610	5,600
Georgia	462.2	40,480	6,130	390	3,840	950	1,040	6,280	2,020	1,600	6,380	1,470
Hawaii	425.7	6,670	910	50	680	220	160	770	310	230	1,060	200
Idaho	461.7	7,220	910	60	600	200	230	860	360	310	1,300	380
Illinois	488.8	63,890	8,770	490	6,340	1,960	1,860	9,190	2,060	2,690	8,730	3,050
Indiana	469.4	33,020	4,350	230	3,330	960	890	5,430	1,200	1,370	4,160	1,510
Iowa	481.0	17,260	2,020	100	1,760	550	560	2,450	900	750	2,420	840
Kansas	§	13,550	1,780	90	1,270	410	400	1,990	650	590	1,630	550
Kentucky	511.2	24,240	3,290	210	2,370	610	630	4,780	1,440	1,030	3,180	1,030
Louisiana	496.0	20,950	2,530	180	2,060	440	590	3,320	600	920	3,410	850
Maine	530.3	8,650	1,160	50	800	280	260	1,370	410	360	1,410	530
Maryland	§	27,700	4,150	200	2,630	810	620	4,170	1,290	1,110	4,010	1,180
Massachusetts	507.8	36,040	5,320	200	3,120	1,150	910	5,020	1,770	1,460	4,820	2,000
Michigan	503.4	55,660	7,340	330	5,170	1,700	1,600	8,150	2,240	2,400	8,490	2,790
Minnesota	479.3	25,080	3,330	140	2,410	850	830	3,150	970	1,100	3,870	1,160
Mississippi	§	14,330	1,970	130	1,480	300	340	2,360	470	540	2,260	510
Missouri	468.9	31,160	3,880	210	3,080	910	870	5,360	1,320	1,260	3,600	1,360
Montana	466.2	5,570	680	‡	490	150	160	740	200	240	960	280
Nebraska	476.8	9,230	1,160	60	910	290	290	1,200	450	410	1,470	420
Nevada	466.2	12,230	1,350	130	1,090	290	320	1,920	410	480	1,750	620
New Hampshire	508.1	7,810	990	‡	720	240	200	1,070	390	310	1,100	430
New Jersey	511.0	48,100	6,820	420	4,430	1,580	1,330	6,260	2,650	2,130	6,790	2,510
New Mexico	416.0	9,210	1,180	90	790	230	280	920	420	370	1,610	350
New York	491.0	103,340	14,610	930	9,780	3,430	2,980	13,720	4,050	4,680	14,840	5,230
North Carolina	460.9	45,120	6,500	360	4,220	1,190	1,150	7,520	2,130	1,800	6,910	1,890
North Dakota	465.1	3,300	400	‡	340	100	100	410	120	150	580	180
Ohio	§	64,450	8,280	410	5,960	2,010	1,810	10,710	2,200	2,720	8,010	2,970
Oklahoma	478.3	18,670	2,300	150	1,730	460	560	3,250	640	810	2,440	770
Oregon	471.2	20,750	2,910	130	1,710	600	530	2,810	1,200	930	3,010	1,040
Pennsylvania	503.7	75,260	10,000	540	7,440	2,450	2,070	10,520	3,550	3,430	9,800	4,050
Rhode Island	515.5	5,970	790	‡	540	190	160	840	290	240	740	350
South Carolina	476.4	23,240	3,260	170	2,140	560	590	3,970	1,060	950	3,600	950
South Dakota	460.2	4,220	530	‡	450	130	130	540	170	180	760	230
Tennessee	§	33,070	4,700	270	3,130	750	850	5,980	1,720	1,360	4,600	1,350
Texas	451.5	101,120	12,920	1,070	9,190	2,420	3,240	14,030	3,570	4,410	13,740	3,650
Utah	408.5	9,970	1,260	80	740	280	310	620	610	430	1,730	390
Vermont	§	3,720	520	‡	320	110	90	490	190	150	600	210
Virginia	444.5	36,410	5,470	280	3,370	1,040	880	5,510	1,810	1,470	5,550	1,520
Washington	494.9	34,500	4,900	220	2,740	1,010	1,000	4,320	1,930	1,600	5,220	1,720
West Virginia	494.2	10,610	1,310	80	1,060	330	280	2,070	440	450	1,440	530
Wisconsin	§	29,610	4,120	200	2,760	1,040	940	3,990	1,050	1,340	4,670	1,510
Wyoming	447.6	2,540	330	‡	220	70	70	320	110	110	420	130
<b>United States</b>	<b>472.9</b>	<b>1,529,560</b>	<b>207,090</b>	<b>12,200</b>	<b>142,570</b>	<b>43,470</b>	<b>43,050</b>	<b>222,520</b>	<b>68,130</b>	<b>65,540</b>	<b>217,730</b>	<b>70,530</b>

\*Rounded to the nearest 10; excludes basal and squamous cell skin cancers and in situ carcinomas except urinary bladder.

†Rates are per 100,000 and age adjusted to the 2000 US standard population.



‡Estimate is fewer than 50 cases.

§Combined incidence rate is not available.



Source: Data as of June 2009 reported by the North American Association of Central Cancer Registries (NAACCR) as meeting high quality standards for 2002-2006 and include data collected by cancer registries participating in NCI's SEER Program and CDC's National Program of Cancer Registries. To account for population anomalies caused by Hurricane Katrina in 2005, statistics exclude data for AL, LA, and TX from July 2005-December 2005.

Note: These model-based estimates are calculated using incidence rates from 41 states and the District of Columbia; they are offered as a rough guide and should be interpreted with caution. State estimates may not add to US total due to rounding and exclusion of states with fewer than 50 cases.

## Estimated New Cases\*

			Males	Females			
Prostate	217,730	28%			Breast	207,090	28%
Lung & bronchus	116,750	15%			Lung & bronchus	105,770	14%
Colon & rectum	72,090	9%			Colon & rectum	70,480	10%
Urinary bladder	52,760	7%			Uterine corpus	43,470	6%
Melanoma of the skin	38,870	5%			Thyroid	33,930	5%
Non-Hodgkin lymphoma	35,380	4%			Non-Hodgkin lymphoma	30,160	4%
Kidney & renal pelvis	35,370	4%			Melanoma of the skin	29,260	4%
Oral cavity & pharynx	25,420	3%			Kidney & renal pelvis	22,870	3%
Leukemia	24,690	3%			Ovary	21,880	3%
Pancreas	21,370	3%			Pancreas	21,770	3%
<b>All Sites</b>	<b>789,620</b>	<b>100%</b>			<b>All Sites</b>	<b>739,940</b>	<b>100%</b>

## Estimated Deaths

			Males	Females			
Lung & bronchus	86,220	29%			Lung & bronchus	71,080	26%
Prostate	32,050	11%			Breast	39,840	15%
Colon & rectum	26,580	9%			Colon & rectum	24,790	9%
Pancreas	18,770	6%			Pancreas	18,030	7%
Liver & intrahepatic bile duct	12,720	4%			Ovary	13,850	5%
Leukemia	12,660	4%			Non-Hodgkin lymphoma	9,500	4%
Esophagus	11,650	4%			Leukemia	9,180	3%
Non-Hodgkin lymphoma	10,710	4%			Uterine Corpus	7,950	3%
Urinary bladder	10,410	3%			Liver & intrahepatic bile duct	6,190	2%
Kidney & renal pelvis	8,210	3%			Brain & other nervous system	5,720	2%
<b>All Sites</b>	<b>299,200</b>	<b>100%</b>			<b>All Sites</b>	<b>270,290</b>	<b>100%</b>

**FIGURE 1. Ten Leading Cancer Types for the Estimated New Cancer Cases and Deaths by Sex, 2010.**

\*Excludes basal and squamous cell skin cancers and in situ carcinoma except urinary bladder. Estimates are rounded to the nearest 10.

National Cancer Institute (NCI), covering approximately 26% of the US population.<sup>2-5</sup> Incidence data (1995-2006) for projecting new cancer cases were obtained from cancer registries that participate in the SEER program or the Centers for Disease Control and Prevention (CDC)'s National Program of Cancer Registries (NPCR), through the North American Association of Central Cancer Registries (NAACCR) covering approximately 89% of the US population. State-specific incidence rates were obtained from NAACCR based on data collected by cancer registries participating in the SEER program and the NPCR.<sup>6</sup> Population data were obtained from the US Census Bureau.<sup>7</sup> Causes of death were coded and classified

according to the *International Classification of Diseases* (ICD-8, ICD-9, and ICD-10).<sup>8-10</sup> Cancer cases were classified according to the *International Classification of Diseases for Oncology*.<sup>11</sup>

## Estimated New Cancer Cases and Deaths

The precise number of cancer cases diagnosed each year in the nation and in every state is unknown because cancer case reporting is incomplete in some states. Furthermore, the most recent year for which incidence and mortality data are available lags 3 to 4 years behind the current year due to the time required for data collection and compilation. Therefore, we project the expected number of new cancer

**TABLE 3. Age-standardized Death Rates for All Cancers Combined, 2002-2006, and Estimated Deaths\* for Selected Cancers by State, United States, 2010**

STATE	DEATH RATE†	ALL SITES	BRAIN & OTHER NERVOUS SYSTEM	FEMALE BREAST	COLON & RECTUM	LEUKEMIA	LIVER	LUNG & BRONCHUS	NON-HODGKIN LYMPHOMA	OVARY	PANCREAS	PROSTATE
Alabama	203.7	10,150	210	690	950	350	310	3,190	320	260	590	600
Alaska	182.0	880	‡	70	80	‡	‡	250	‡	‡	60	‡
Arizona	163.9	10,630	280	740	1,020	420	380	2,670	360	290	740	650
Arkansas	205.0	6,460	150	430	600	240	200	1,900	200	140	430	460
California	169.7	55,710	1,490	4,230	4,970	2,220	2,600	12,630	2,110	1,500	3,900	3,710
Colorado	163.5	6,880	210	500	660	270	230	1,670	280	210	460	390
Connecticut	182.6	6,850	150	490	540	230	200	1,760	230	180	540	410
Delaware	198.7	1,900	‡	120	160	70	50	580	60	‡	120	100
Dist. of Columbia	204.9	960	‡	80	100	‡	‡	230	‡	‡	70	70
Florida	177.3	40,880	800	2,650	3,540	1,560	1,360	11,620	1,480	930	2,560	2,590
Georgia	190.3	15,570	340	1,100	1,430	560	430	4,620	500	390	940	930
Hawaii	150.3	2,330	‡	140	220	80	120	570	90	50	180	120
Idaho	171.6	2,530	80	160	220	120	70	640	90	60	190	180
Illinois	194.5	23,360	470	1,790	2,310	900	700	6,490	740	570	1,580	1,420
Indiana	202.7	12,900	340	860	1,130	520	340	4,000	440	300	790	620
Iowa	184.3	6,370	170	380	620	300	160	1,770	290	170	380	370
Kansas	184.7	5,370	140	370	530	260	140	1,590	200	140	330	300
Kentucky	219.3	9,670	180	580	880	320	250	3,410	310	200	540	470
Louisiana	217.0	8,480	210	620	920	310	340	2,550	280	200	540	440
Maine	204.1	3,170	80	170	270	110	80	960	90	70	200	150
Maryland	193.3	10,250	210	800	950	390	360	2,760	310	250	710	650
Massachusetts	190.9	12,990	280	780	1,050	470	440	3,530	400	330	920	600
Michigan	193.4	20,740	500	1,320	1,740	810	600	5,830	700	500	1,330	1,010
Minnesota	176.6	9,200	240	610	780	390	280	2,450	330	220	600	440
Mississippi	211.3	6,060	130	400	630	230	190	2,010	190	130	360	330
Missouri	200.1	12,620	280	860	1,120	540	380	3,950	450	250	790	710
Montana	182.7	1,980	60	110	170	90	50	580	80	50	120	130
Nebraska	178.2	3,500	90	210	360	140	80	900	150	80	200	240
Nevada	193.0	4,640	120	330	530	110	180	1,300	150	110	300	270
New Hampshire	190.6	2,660	70	190	210	90	80	750	70	60	190	140
New Jersey	189.4	16,520	340	1,430	1,600	600	470	4,220	640	430	1,130	940
New Mexico	165.2	3,400	80	230	340	120	150	780	120	80	230	240
New York	176.1	34,540	800	2,490	3,120	1,380	1,270	8,720	1,480	910	2,440	1,690
North Carolina	194.3	19,100	350	1,340	1,520	650	500	5,650	570	390	1,160	980
North Dakota	175.5	1,280	‡	80	120	60	‡	320	‡	‡	90	70
Ohio	202.3	24,980	540	1,730	2,280	930	680	7,260	840	540	1,530	1,440
Oklahoma	198.1	7,660	170	520	700	290	220	2,390	280	160	400	320
Oregon	189.2	7,510	210	490	690	280	230	2,100	310	210	490	430
Pennsylvania	196.4	28,690	550	1,980	2,610	1,100	840	7,960	1,100	730	2,010	1,660
Rhode Island	191.4	2,170	50	130	150	90	70	600	60	60	120	80
South Carolina	197.7	9,180	200	640	770	330	270	2,870	300	220	560	490
South Dakota	178.8	1,670	‡	100	160	70	‡	450	60	50	100	100
Tennessee	208.8	13,600	340	890	1,190	490	380	4,520	470	250	750	690
Texas	181.7	36,540	840	2,780	3,340	1,410	1,660	9,600	1,280	840	2,200	1,820
Utah	139.2	2,820	100	250	250	140	80	480	100	80	200	200
Vermont	179.4	1,280	‡	90	120	50	‡	370	‡	‡	80	50
Virginia	191.9	14,230	300	1,120	1,300	510	410	4,050	450	370	930	710
Washington	183.4	11,640	370	790	980	480	440	3,110	440	330	760	770
West Virginia	211.4	4,670	100	270	440	150	120	1,480	190	110	220	130
Wisconsin	184.3	11,310	270	690	900	490	330	2,940	410	290	720	600
Wyoming	176.7	1,000	‡	60	110	‡	‡	260	50	‡	70	‡
<b>United States</b>	<b>186.9</b>	<b>569,490</b>	<b>13,140</b>	<b>39,840</b>	<b>51,370</b>	<b>21,840</b>	<b>18,910</b>	<b>157,300</b>	<b>20,210</b>	<b>13,850</b>	<b>36,800</b>	<b>32,050</b>

\*Rounded to the nearest 10.

†Rates are per 100,000 and age adjusted to the 2000 US standard population.

‡Estimate is fewer than 50 deaths.

Note: State estimates may not add to US total due to rounding and exclusion of states with fewer than 50 deaths.

Source: US Mortality Data, 1969 to 2007, National Center for Health Statistics, Centers for Disease Control and Prevention.



TABLE 4. Cancer Incidence Rates\* by Site and State, United States, 2002 to 2006

STATE	ALL SITES		BREAST	COLORECTUM		LUNG & BRONCHUS		NON-HODGKIN LYMPHOMA		PROSTATE	URINARY BLADDER	
	MALE	FEMALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	MALE	FEMALE
Alabama†	561.2	379.6	114.6	61.7	42.0	107.8	52.9	20.5	13.8	154.2	31.8	7.6
Alaska	529.4	417.7	126.4	60.0	45.6	84.6	64.3	22.6	17.6	141.4	41.6	7.3
Arizona‡	465.9	364.0	108.8	48.9	36.0	69.6	49.1	18.9	13.5	118.9	35.3	8.9
Arkansas	562.8	383.5	113.1	58.8	42.7	111.3	59.5	21.8	15.6	161.3	33.0	8.6
California	510.1	393.3	122.3	52.2	39.2	65.1	47.0	22.4	15.5	149.0	34.0	8.2
Colorado	501.5	394.1	123.1	50.0	39.5	60.5	45.2	21.0	16.2	156.4	33.6	8.8
Connecticut	591.0	455.5	135.0	62.8	46.5	81.8	60.1	25.8	18.1	164.6	45.4	12.6
Delaware	607.7	440.8	123.9	62.0	44.8	97.6	70.0	23.5	16.1	179.9	42.8	11.1
Dist. of Columbia‡	556.0	412.1	132.7	57.4	46.3	81.4	46.6	22.8	13.7	175.2	24.0	8.3
Florida	537.3	404.2	114.1	55.2	41.7	89.2	60.3	21.6	15.4	138.4	37.4	9.7
Georgia	566.4	392.4	118.5	58.7	42.3	101.7	53.3	20.8	14.1	162.4	32.7	8.0
Hawaii	486.7	383.0	121.4	61.3	41.5	68.8	40.1	19.0	12.6	128.6	26.2	6.2
Idaho	538.4	401.7	117.5	49.9	38.0	68.7	48.3	21.4	17.2	165.8	37.0	8.8
Illinois	579.8	429.1	123.1	67.2	48.3	92.3	58.8	24.1	16.2	157.9	40.7	10.5
Indiana	551.3	415.1	115.3	62.8	46.4	103.6	63.3	22.8	16.4	135.9	37.4	9.4
Iowa	558.9	429.2	124.0	64.4	49.6	89.9	53.1	24.4	17.6	144.9	40.7	9.6
Kansas	557.2	417.2	126.1	61.3	43.6	87.6	53.2	24.1	18.0	159.6	36.2	8.5
Kentucky	608.4	446.4	119.8	68.0	49.8	133.1	76.9	23.1	16.9	142.5	39.0	9.9
Louisiana†	619.2	409.6	119.6	68.5	47.3	109.5	57.9	23.2	16.7	176.8	35.2	8.6
Maine	620.9	465.8	128.6	65.9	48.8	99.2	66.0	24.5	19.2	164.8	49.4	13.4
Maryland§	—	—	—	—	—	—	—	—	—	—	—	—
Massachusetts	591.8	452.9	132.2	63.9	45.7	83.7	62.4	23.4	16.5	164.6	46.7	12.9
Michigan	597.5	437.9	124.2	58.8	44.6	93.0	61.5	25.2	18.7	179.4	41.9	10.5
Minnesota	567.2	416.4	126.4	56.4	42.3	69.8	49.5	26.4	17.7	184.6	40.1	10.3
Mississippi‡	574.7	382.1	108.2	64.5	46.3	111.7	54.5	20.9	13.5	166.7	29.6	7.5
Missouri	544.3	417.2	121.9	62.3	44.9	105.2	63.4	21.8	15.5	129.3	35.8	8.9
Montana	541.9	406.3	119.6	52.5	40.3	75.3	57.4	22.8	14.9	174.5	40.8	9.1
Nebraska	561.8	418.2	126.4	67.6	47.5	84.6	49.3	24.7	17.4	157.6	37.2	9.5
Nevada	531.2	412.0	112.1	55.2	43.4	83.3	69.0	22.2	15.3	144.2	40.7	11.0
New Hampshire	584.3	455.3	131.2	59.0	44.5	82.1	62.7	23.5	18.2	159.5	48.0	13.4
New Jersey	603.9	449.5	128.0	65.4	48.0	79.6	56.0	25.6	17.7	177.9	46.2	12.2
New Mexico	480.5	366.1	109.6	49.4	35.8	57.5	39.0	17.9	14.3	146.1	26.7	7.0
New York	577.5	434.4	124.5	60.8	45.8	79.4	54.1	24.7	17.3	166.3	42.3	11.1
North Carolina	553.4	398.1	120.3	57.2	41.6	101.3	56.0	21.2	15.1	153.2	34.9	8.8
North Dakota	549.3	402.7	122.8	66.6	43.1	74.6	48.0	22.7	15.8	169.5	39.6	10.0
Ohio§	—	—	—	—	—	—	—	—	—	—	—	—
Oklahoma	561.4	422.2	127.2	60.1	43.7	105.6	65.1	22.9	17.5	150.0	34.9	8.6
Oregon	529.3	429.7	131.9	52.8	41.1	79.4	60.4	24.4	17.0	148.0	39.2	10.0
Pennsylvania	592.7	444.6	124.5	66.1	48.3	91.0	56.4	25.1	17.5	159.7	44.8	11.2
Rhode Island	608.9	455.3	128.3	65.7	46.2	92.2	62.2	24.8	17.5	152.2	53.1	13.0
South Carolina	587.4	397.5	119.2	61.2	44.1	102.2	53.0	20.7	14.6	171.5	32.4	7.8
South Dakota	547.8	395.3	119.6	60.2	44.5	78.7	46.3	22.1	17.0	171.0	39.1	8.1
Tennessee¶¶	548.3	400.6	116.4	58.4	43.2	113.6	60.6	21.6	15.8	132.7	34.0	8.3
Texas†	539.6	389.9	114.9	57.5	39.7	88.3	51.2	22.3	16.1	144.0	30.2	7.3
Utah	486.8	346.6	110.0	45.3	33.7	37.8	23.0	22.4	16.3	182.2	28.3	6.1
Vermont§	—	—	—	—	—	—	—	—	—	—	—	—
Virginia	529.5	385.8	120.7	55.5	41.8	88.5	53.6	20.6	13.4	155.0	33.3	8.4
Washington	566.9	443.3	134.8	52.6	40.1	78.7	59.5	27.2	18.3	165.3	41.3	10.2
West Virginia	578.6	437.1	114.7	69.5	50.7	117.7	70.1	22.9	16.8	138.6	39.8	11.4
Wisconsin§	—	—	—	—	—	—	—	—	—	—	—	—
Wyoming	516.5	392.9	117.8	52.0	43.0	62.1	47.7	21.4	15.8	168.0	42.1	10.0
<b>United States</b>	<b>556.5</b>	<b>414.8</b>	<b>121.8</b>	<b>59.0</b>	<b>43.6</b>	<b>86.4</b>	<b>55.5</b>	<b>23.1</b>	<b>16.3</b>	<b>155.5</b>	<b>37.9</b>	<b>9.6</b>

\*Per 100,000, age adjusted to the 2000 US standard population.

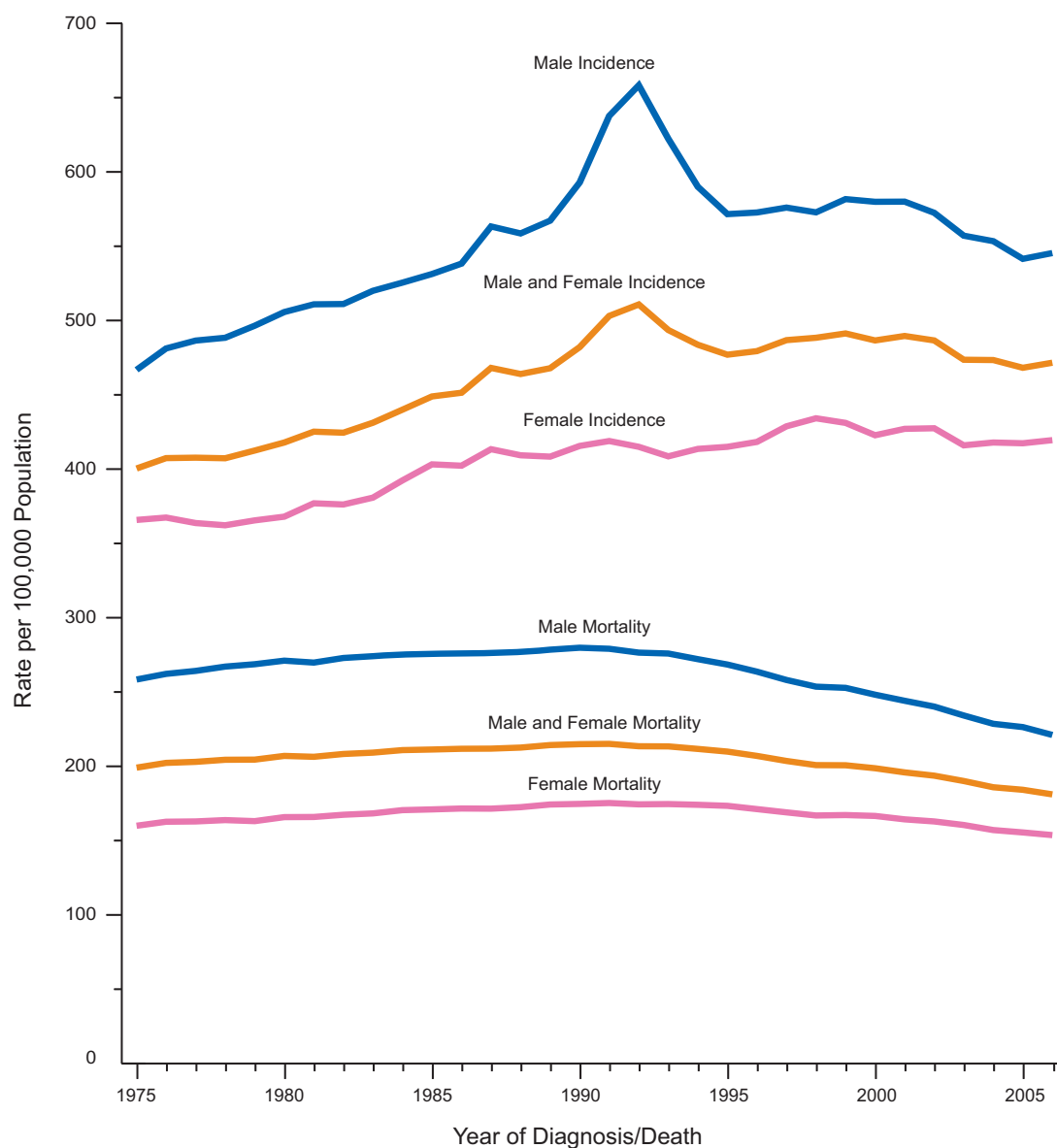
†Due to the displacement of populations after Hurricane Katrina in September 2005, 2005 statistics are based on cases diagnosed in January to June.

‡This state's registry did not achieve high quality data standards for one or more years during 2002-2006 according to the North American Association of Central Cancer Registry (NAACCR) data quality indicators.

§This state's registry did not submit incidence data to NAACCR for 2002-2006.

¶¶Case ascertainment for this state's registry is incomplete for the years 2002-2006.

Source: NAACCR, 2009. Data are collected by cancer registries participating in the National Cancer Institute's SEER program and the Centers for Disease Control and Prevention's National Program of Cancer Registries.



**FIGURE 2. Annual Age-Adjusted Cancer Incidence and Death Rates\* by Sex, United States, 1975 to 2006.**

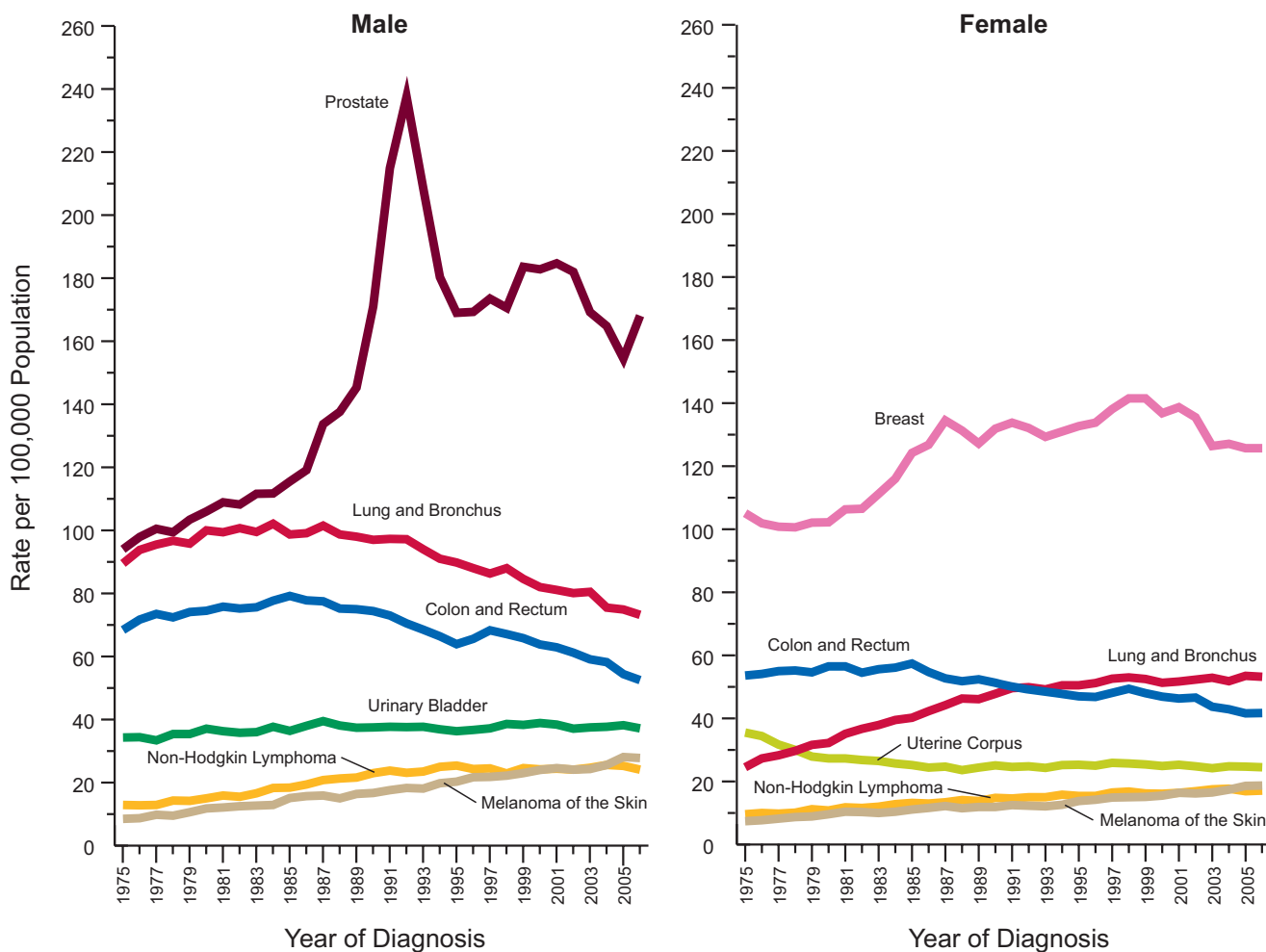
\*Rates are age adjusted to the 2000 US standard population. Incidences rates are adjusted for delays in reporting. Sources: Incidence: Surveillance, Epidemiology, and End Results (SEER) program (available at: [www.seer.cancer.gov](http://www.seer.cancer.gov)). Delay-adjusted incidence database: SEER Incidence Delay-Adjusted Rates, 9 Registries, 1975-2006. Bethesda, MD: National Cancer Institute, Division of Cancer Control and Population Sciences, Surveillance Research Program, Statistical Research and Applications Branch; 2009. Released April 2009, based on the November 2008 SEER data submission. Mortality: US Mortality Data, 1975 to 2006. National Center for Health Statistics, Centers for Disease Control and Prevention.

cases and deaths in the United States in 2010 to provide an estimate of the current cancer burden. Estimated new cancer cases in the current year (2010) were projected using a spatiotemporal model based on incidence data from 1995 through 2006 from 44 states and the District of Columbia that met the NAACCR's high-quality data standard for incidence, covering approximately 89% of the US population.<sup>12</sup> The method also considers geographic variations in sociodemographic and life-style factors, medical settings, and cancer screening

behaviors as predictors of incidence, and accounts for expected delays in case reporting.

We used the state-space prediction method to estimate the number of cancer deaths expected to occur in the United States and in each state in the year 2010.<sup>13</sup> Projections are based on underlying cause-of-death from death certificates as reported to the NCHS.<sup>1</sup> This model projects the number of cancer deaths expected to occur in 2010 based on the number that occurred each year from 1969 to 2007 in the United States and in each state separately.





**FIGURE 3. Annual Age-Adjusted Cancer Incidence Rates\* for Selected Cancers by Sex, United States, 1975 to 2006.**

\*Rates are age adjusted to the 2000 US standard population and adjusted for delays in reporting. Source: Surveillance, Epidemiology, and End Results (SEER) program (available at: [www.seer.cancer.gov](http://www.seer.cancer.gov)). Delay-adjusted incidence database: SEER Incidence Delay-Adjusted Rates, 9 Registries, 1975-2006. Bethesda, MD: National Cancer Institute, Division of Cancer Control and Population Sciences, Surveillance Research Program, Statistical Research and Applications Branch; 2009. Released April 2009, based on the November 2008 SEER data submission.

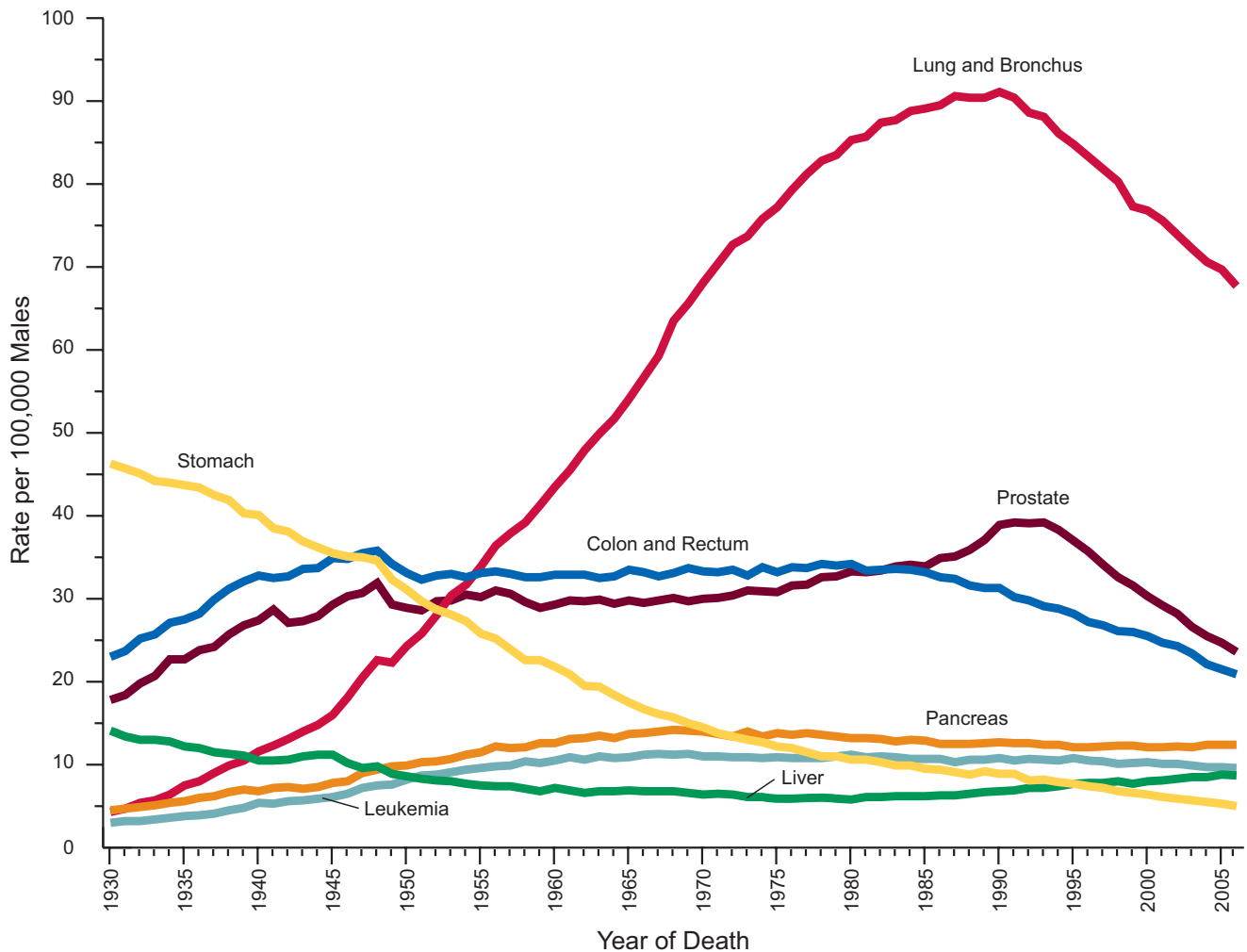
## Other Statistics

We provide mortality statistics for the leading causes of death as well as deaths from cancer in the year 2007. Causes of death for 2007 were coded and classified according to ICD-10.<sup>10</sup> This report also provides updated statistics regarding trends in cancer incidence and mortality rates, the probability of developing cancer, and 5-year relative survival rates for selected cancer sites based on data from 1975 through 2006.<sup>2,6</sup> All age-adjusted incidence and death rates are standardized to the 2000 US standard population and expressed per 100,000 population.

The incidence rates (2002-2006) and long-term trends (1975-2006) are adjusted for delays in reporting when possible. Delayed reporting primarily affects the most recent 1 to 3 years of incidence data (in this case, 2004-2006), especially for cancers such as melanoma,

leukemia, and prostate that are frequently diagnosed in outpatient settings. The NCI has developed a method to account for expected reporting delays in SEER registries for all cancer sites combined and many specific cancer sites.<sup>14</sup> Delay-adjusted rates provide a more accurate assessment of trends in the most recent years for which data are available. Long-term incidence and mortality trends for selected cancer sites were previously published in the *2010 Annual Report to the Nation on the Status of Cancer*.<sup>15</sup>

We also provide the contribution of individual cancer sites to the total decrease in overall cancer death rates since 1990 in men and 1991 in women and estimates of the total number of cancer deaths avoided because of the reduction in overall age-standardized cancer death rates through 2006. The total number of cancer deaths avoided was calculated by applying the age-specific



**FIGURE 4. Annual Age-Adjusted Cancer Death Rates\* Among Males for Selected Cancers, United States, 1930 to 2006.**

\*Rates are age adjusted to the 2000 US standard population. Due to changes in International Classification of Diseases (ICD) coding, numerator information has changed over time. Rates for cancers of the lung and bronchus, colon and rectum, and liver are affected by these changes. Source: US Mortality Data, 1960 to 2006, US Mortality Vol. 1930 to 1959. National Center for Health Statistics, Centers for Disease Control and Prevention.

cancer death rates in the peak year for the age-standardized cancer death rates (1990 for males and 1991 for females) to the corresponding age-specific populations in the subsequent years through 2006 to obtain the number of expected deaths in each calendar year if the death rates had not decreased. We then summed the difference between the number of expected and observed deaths in each age group and calendar year for men and women separately to obtain the total number of cancer deaths avoided over the 15-year (women) or 16-year (men) interval.

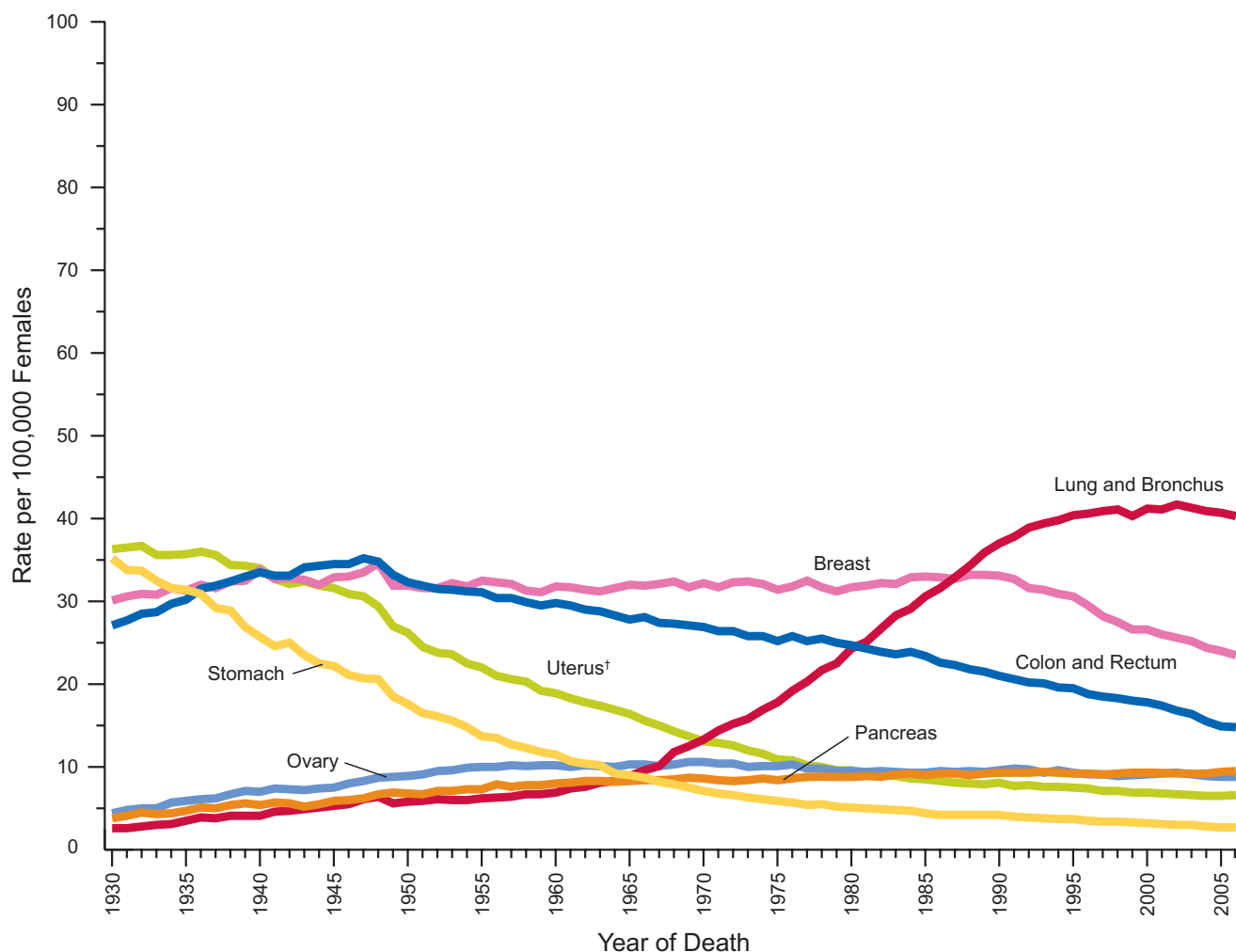
## Selected Findings

### Expected Numbers of New Cancer Cases in 2010

Table 1 presents estimates of the number of new cases of invasive cancer expected among men and women in

the US in 2010. The overall estimate of approximately 1.53 million new cases does not include carcinoma in situ of any site except urinary bladder, nor does it include basal cell and squamous cell cancers of the skin. Greater than 2 million unreported cases of basal cell and squamous cell skin cancer, approximately 54,010 cases of breast carcinoma in situ, and 46,770 cases of melanoma in situ are expected to be newly diagnosed in 2010. The estimated numbers of new cancer cases for each state and selected cancer sites are shown in Table 2.

Figure 1 indicates the most common cancers expected to occur in men and women in 2010. Among men, cancers of the prostate, lung and bronchus, and colorectum account for 52% of all newly diagnosed cancers. Prostate cancer alone accounts for 28% (217,730) of incident cases in men. Based on cases



**FIGURE 5. Annual Age-Adjusted Cancer Death Rates\* Among Females for Selected Cancers, United States, 1930 to 2006.**

\*Rates are age adjusted to the 2000 US standard population.

†Uterus includes uterine cervix and uterine corpus. Due to changes in International Classification of Diseases (ICD) coding, numerator information has changed over time. Rates for cancers of the uterus, ovary, lung and bronchus, and colon and rectum are affected by these changes. Source: US Mortality Data, 1960 to 2006, US Mortality Volumes 1930 to 1959. National Center for Health Statistics, Centers for Disease Control and Prevention.

diagnosed between 1999 and 2005, an estimated 92% of these new cases of prostate cancer are expected to be diagnosed at local or regional stages, for which the 5-year relative survival approaches 100%.

The 3 most commonly diagnosed types of cancer among women in 2010 will be cancers of the breast, lung and bronchus, and colorectum, accounting for 52% of estimated cancer cases in women. Breast cancer alone is expected to account for 28% (207,090) of all new cancer cases among women.

### Expected Number of Cancer Deaths in 2010

Table 1 also shows the expected number of deaths from cancer projected for 2010 for men, women, and both sexes combined. It is estimated that approximately 569,490 Americans will die from cancer, corresponding

to greater than 1500 deaths per day. Cancers of the lung and bronchus, prostate, and colorectum in men, and cancers of the lung and bronchus, breast, and colorectum in women continue to be the most common fatal cancers. These 4 cancers account for approximately half of the total cancer deaths among men and women (Fig. 1). Lung cancer surpassed breast cancer as the leading cause of cancer death in women in 1987 and is expected to account for 26% of all female cancer deaths in 2010. Table 3 provides the estimated number of cancer deaths in 2010 by state for selected cancer sites.

### Regional Variations in Cancer Rates

Table 4 depicts cancer incidence rates for selected cancer sites by state. By far, the largest variation in incidence among the cancer sites listed in Table 4 is for

TABLE 5. Trends in Cancer Incidence and Death Rates for Selected Cancers by Sex, United States, 1975 to 2006

	TREND 1		TREND 2		TREND 3		TREND 4		TREND 5	
	YEARS	APC*	YEARS	APC*	YEARS	APC*	YEARS	APC*	YEARS	APC*
<b>All sites</b>										
<b>Incidence</b>										
Male and female	1975-1989	1.2†	1989-1992	2.8†	1992-1995	-2.4	1995-1999	0.9	1999-2006	-0.7†
Male	1975-1989	1.3†	1989-1992	5.2†	1992-1995	-4.9†	1995-2000	0.5	2000-2006	-1.3†
Female	1975-1979	-0.3	1979-1987	1.6†	1987-1995	0.1	1995-1998	1.4	1998-2006	-0.5†
<b>Death</b>										
Male and female	1975-1990	0.5†	1990-1993	-0.3	1993-2001	-1.1†	2001-2006	-1.6†		
Male	1975-1979	1.0†	1979-1990	0.3†	1990-1993	-0.5	1993-2001	-1.5†	2001-2006	-2.0†
Female	1975-1990	0.6†	1990-1994	-0.1	1994-2002	-0.8†	2002-2006	-1.5†		
<b>Lung &amp; bronchus</b>										
<b>Incidence</b>										
Male	1975-1982	1.4†	1982-1991	-0.4	1991-2006	-1.8†				
Female	1975-1982	5.6†	1982-1991	3.4†	1991-2006	0.4†				
<b>Death</b>										
Male	1975-1978	2.5†	1978-1984	1.2†	1984-1990	0.4†	1990-1994	-1.3†	1994-2006	-2.0†
Female	1975-1982	6.0†	1982-1990	4.2†	1990-1995	1.7†	1995-2003	0.3†	2003-2006	-0.9
<b>Colorectum</b>										
<b>Incidence</b>										
Male	1975-1985	1.1†	1985-1991	-1.2†	1991-1995	-3.2†	1995-1998	2.1	1998-2006	-3.0†
Female	1975-1985	0.3	1985-1995	-1.8†	1995-1998	1.9	1998-2006	-2.2†		
<b>Death</b>										
Male	1975-1984	-0.1	1984-1990	-1.4†	1990-2002	-2.0†	2002-2006	-3.9†		
Female	1975-1984	-1.0†	1984-2001	-1.8†	2001-2006	-3.4†				
<b>Female breast</b>										
<b>Incidence</b>										
	1975-1980	-0.5	1980-1987	4.0†	1987-1994	-0.1	1994-1999	1.6†	1999-2006	-2.0†
<b>Death</b>										
	1975-1990	0.4†	1990-1995	-1.8†	1995-1998	-3.3†	1998-2006	-1.9†		
<b>Prostate</b>										
<b>Incidence</b>										
	1975-1988	2.6†	1988-1992	16.5†	1992-1995	-11.7†	1995-2000	2.4	2000-2006	-2.4†
<b>Death</b>										
	1975-1987	0.9†	1987-1991	3.0†	1991-1994	-0.6	1994-2006	-4.1†		

\*Annual percent change (APC) based on incidence (delay-adjusted) and mortality rates age adjusted to the 2000 US standard population.

†The APC is significantly different from zero ( $P < 0.05$ ).

Note: Trends were analyzed by Joinpoint Regression Program, version 3.3.1, with a maximum of four joinpoints (ie, five line segments).

Source: Edwards, et al.<sup>15</sup>

lung cancer, for which rates (cases per 100,000 population) range from 37.8 in men and 23.0 in women in Utah to 133.1 in men and 76.9 in women in Kentucky. This variation reflects the large and continuing differences in smoking prevalence among states. Utah ranks lowest in adult smoking prevalence and Kentucky highest. In contrast, state variation in the incidence rates of other cancer sites shown in Table 4 is smaller in both absolute and proportionate terms. For screenable cancers, such as those of the prostate and female breast, variation in incidence rates reflects differences in the use of screening tests in addition to differences in disease occurrence.

### Trends in Cancer Incidence and Mortality

Figures 2 to 5 depict long-term trends in cancer incidence and death rates for all cancers combined and for selected cancer sites by sex. Table 5 shows incidence and mortality patterns for all cancer sites

and for the 4 most common cancer sites based on join point analysis. Trends in incidence were adjusted for delayed reporting. Delay-adjusted cancer incidence rates decreased by 1.3% per year from 2000 through 2006 in males and by 0.5% per year from 1998 through 2006 in females.<sup>15</sup> Incidence trends decreased for all 4 major cancer sites except for lung cancer in women, in whom rates are still increasing, though at a much slower rate than in previous years. The lag in the temporal trend of lung cancer rates in women compared with men reflects historical differences in cigarette smoking between men and women; cigarette smoking in women peaked approximately 20 years later than in men. The accelerated decrease in colorectal cancer incidence rates from 1998 to 2006 largely reflects increases in screening that can detect and remove precancerous polyps.<sup>15</sup> The decrease in prostate cancer incidence rates (by 2.4% per year from

TABLE 6. The Contribution of Individual Cancer Sites to the Decrease in Cancer Death Rates, 1990-2006

MALE	DEATH RATE (PER 100,000)		CHANGE		% CONTRIBUTION†
	1990*	2006	ABSOLUTE	%	
All malignant cancers	279.82	221.11	-58.71	-20.98	
<b>Decreasing</b>					
Lung & bronchus	90.56	67.45	-23.11	-25.52	37.2
Prostate	38.56	23.56	-15.01	-38.91	24.2
Colorectum	30.77	20.51	-10.27	-33.36	16.5
Stomach	8.86	5.04	-3.82	-43.12	6.1
Oral cavity & pharynx	5.61	3.78	-1.83	-32.61	2.9
Non-Hodgkin lymphoma	9.97	8.41	-1.56	-15.63	2.5
Leukemia	10.71	9.61	-1.10	-10.31	1.8
Brain & other nervous system	5.97	5.13	-0.84	-14.10	1.4
Larynx	2.97	2.19	-0.78	-26.22	1.3
Myeloma	4.83	4.36	-0.47	-9.70	0.8
Kidney & renal pelvis	6.16	5.74	-0.42	-6.86	0.7
Urinary bladder	7.97	7.57	-0.40	-5.00	0.6
Hodgkin lymphoma	0.85	0.56	-0.30	-34.70	0.5
Other	39.79	37.56	-2.23	-5.61	3.6
<b>Total</b>	<b>263.59</b>	<b>201.46</b>	<b>-62.13</b>		<b>100.0</b>
<b>Increasing</b>					
Esophagus	7.16	7.852	0.69	9.70	
Liver & Intrahepatic Bile Duct	5.27	7.73	2.45	46.54	
Melanoma of the Skin	3.80	4.07	0.27	7.07	
<b>Total</b>	<b>16.23</b>	<b>19.65</b>	<b>3.42</b>		
FEMALE	DEATH RATE (PER 100,000)		CHANGE		% CONTRIBUTION†
	1991*	2006	ABSOLUTE	%	
All malignant cancers	175.30	153.66	-21.64	-12.34	
<b>Decreasing</b>					
Breast	32.69		-9.24	-28.26	36.7
Colorectum	20.30		-5.77	-28.40	22.9
Non-Hodgkin Lymphoma	6.74		-1.37	-20.30	5.4
Stomach	4.01		-1.36	-33.98	5.4
Cervix Uteri	3.49		-1.07	-30.65	4.3
Ovary	9.51		-0.97	-10.24	3.9
Leukemia	6.32		-0.92	-14.61	3.7
Brain & Other Nervous System	4.11		-0.72	-17.63	2.9
Oral Cavity & Pharynx	2.03		-0.64	-31.56	2.5
Other	36.69		-3.08	-8.40	12.3
<b>Total</b>	<b>125.90</b>		<b>-25.15</b>	<b>-19.98</b>	<b>100.0</b>
<b>Increasing</b>					
Lung & bronchus	37.61	40.17	2.56	6.82	
Liver & intrahepatic bile duct	2.52	3.27	0.75	29.98	
Pancreas	9.28	9.48	0.20	2.10	
<b>Total</b>	<b>49.40</b>	<b>52.92</b>	<b>3.51</b>		

\*Death rates for cancer peaked in 1990 in men and in 1991 in women.

†This calculation is based on each cancer site's contribution to the increasing or decreasing portion of the total cancer death rate, depending on the individual site's trend; it does not represent the contribution to the net decrease in cancer death rates.

2000-2006) may reflect recent stabilization of prostate-specific antigen testing, resulting in decreased detection or a reduced number of undiagnosed cases.<sup>16-18</sup> The decrease in the breast cancer incidence rate since 1999 likely reflects the large discontinuity in the use of menopausal hormone therapy among postmenopausal women beginning in 2001, and it may also reflect delayed diagnosis

due to decreased mammography use.<sup>19-20</sup> However, close inspection of incidence data by individual year (Fig. 3) shows that after a 6% decrease from 2002 to 2003, incidence rates from 2003 to 2006 remained relatively unchanged. This may support the hypothesis that postmenopausal hormones may be acting as promoters rather than initiators of breast cancer.<sup>20</sup>

TABLE 7. Fifteen Leading Causes of Death, United States, 2007

RANK	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENT (%) OF TOTAL DEATHS	DEATH RATE*
	<b>All Causes</b>	<b>2,423,712</b>	<b>100.0</b>	<b>760.2</b>
1	Heart diseases	616,067	25.4	190.9
2	Cancer	562,875	23.2	178.4
3	Cerebrovascular diseases	135,952	5.6	42.2
4	Chronic lower respiratory diseases	127,924	5.3	40.8
5	Accidents (unintentional injuries)	123,706	5.1	40.0
6	Alzheimer disease	74,632	3.1	22.7
7	Diabetes mellitus	71,382	2.9	22.5
8	Influenza & pneumonia	52,717	2.2	16.2
9	Nephritis, nephrotic syndrome, & nephrosis	46,448	1.9	14.5
10	Septicemia	34,828	1.4	11.0
11	Intentional self-harm (suicide)	34,598	1.4	11.3
12	Chronic liver disease & cirrhosis	29,165	1.2	9.1
13	Essential hypertension & hypertensive renal disease†	23,965	1.0	7.4
14	Parkinson disease	20,058	0.8	6.4
15	Assault (homicide)	18,361	0.8	6.1
	All other & ill-defined causes	451,034	18.6	

\*Rates are per 100,000 population and age adjusted to the 2000 US standard population.

†Includes primary and secondary hypertension.

Note: Percentages may not total 100 due to rounding. In accordance with the National Center for Health Statistics' cause-of-death ranking, "Symptoms, signs, and abnormal clinical or laboratory findings" and categories that begin with "Other" and "All other" were not ranked.

Source: US Mortality Data, 2007. National Center for Health Statistics, Centers for Disease Control and Prevention.

TABLE 8. Trends in the Recorded Number of Deaths from Selected Cancers by Sex, United States, 1990 to 2007

YEAR	ALL SITES		LUNG AND BRONCHUS		COLORECTUM		PROSTATE	BREAST
	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
1990	268,283	237,039	91,014	50,136	28,484	28,674	32,378	43,391
1991	272,380	242,277	91,603	52,022	28,026	28,753	33,564	43,583
1992	274,838	245,740	91,322	54,485	28,280	28,714	34,240	43,068
1993	279,375	250,529	92,493	56,234	28,199	29,206	34,865	43,555
1994	280,465	253,845	91,825	57,535	28,471	28,936	34,902	43,644
1995	281,611	256,844	91,800	59,304	28,409	29,237	34,475	43,844
1996	281,898	257,635	91,559	60,351	27,989	28,766	34,123	43,091
1997	281,110	258,467	91,278	61,922	28,075	28,621	32,891	41,943
1998	282,065	259,467	91,399	63,075	28,024	28,950	32,203	41,737
1999	285,832	264,006	89,401	62,662	28,313	28,909	31,729	41,144
2000	286,082	267,009	90,415	65,016	28,484	28,950	31,078	41,872
2001	287,075	266,693	90,367	65,606	28,229	28,579	30,719	41,394
2002	288,768	268,503	90,121	67,509	28,472	28,132	30,446	41,514
2003	287,990	268,912	89,908	68,084	27,991	27,793	29,554	41,620
2004	286,830	267,058	89,575	68,431	26,881	26,699	29,002	40,954
2005	290,422	268,890	90,141	69,079	26,783	26,224	28,905	41,116
2006	290,069	269,819	89,243	69,357	26,803	26,396	28,372	40,821
2007	292,857	270,018	88,331	70,355	27,005	26,216	29,093	40,599

Note: Effective with the mortality data for 1999, causes of death are classified by ICD-10, replacing ICD-9 used for 1990 to 1998 data.

Source: US Mortality Data, 1990 to 2007. National Center for Health Statistics, Centers for Disease Control and Prevention.

Death rates for all cancer sites combined decreased by 2.0% per year in men from 2001 through 2006 and by 1.5% per year in women from 2002 to 2006, compared with declines of 1.5% per year in men from 1993 to 2001 and 0.8% per year in women from 1994 through 2002 (Table 5). Mortality rates have

continued to decrease across all 4 major cancer sites in both men and women, except for female lung cancer, for which rates stabilized from 2003 to 2006 after increasing for many decades. Table 6 shows the contribution of individual cancer sites to the decreasing portion of the total cancer death rate for



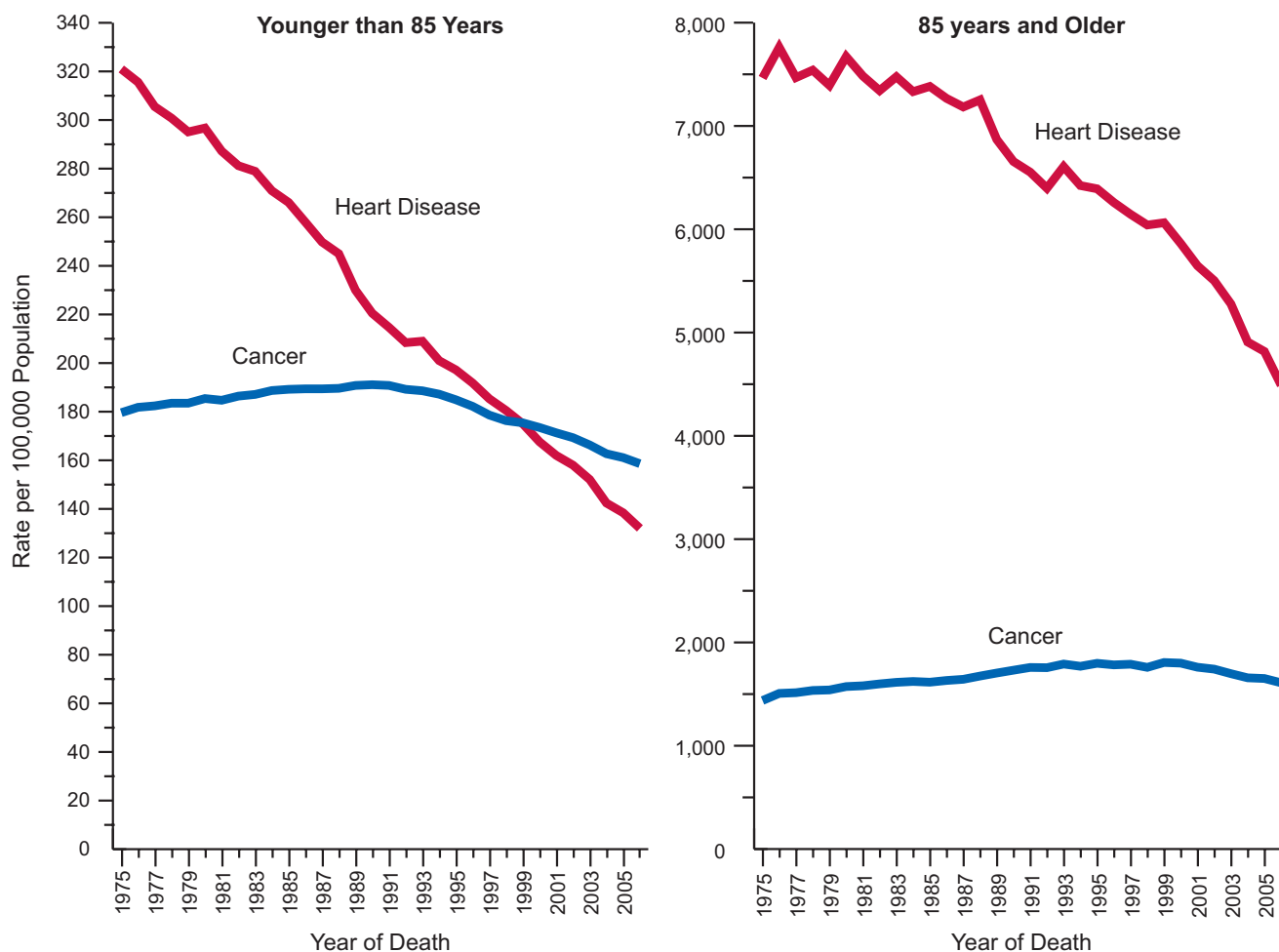
TABLE 9. Ten Leading Causes of Death by Age and Sex, United States, 2007

	ALL AGES		AGES 1 TO 19		AGES 20 TO 39		AGES 40 TO 59		AGES 60 TO 79		AGES 80+	
	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
	All Causes 1,203,968	All Causes 1,219,744	All Causes 15,777	All Causes 8,372	All Causes 65,305	All Causes 28,831	All Causes 226,396	All Causes 139,473	All Causes 460,041	All Causes 372,878	All Causes 420,000	All Causes 657,300
1	Heart diseases 309,821	Heart diseases 306,246	Accidents (unintentional injuries) 6,875	Accidents (unintentional injuries) 3,400	Accidents (unintentional injuries) 24,329	Accidents (unintentional injuries) 7,789	Cancer 54,054	Cancer 50,640	Cancer 152,231	Cancer 126,918	Heart diseases 130,779	Heart diseases 204,138
2	Cancer 292,857	Cancer 270,018	Assault (homicide) 2,355	Cancer 911	Intentional self-harm (suicide) 8,901	Cancer 4,639	Heart diseases 53,779	Heart diseases 21,389	Heart diseases 119,209	Heart diseases 77,703	Cancer 81,403	Cancer 86,873
3	Accidents (unintentional injuries) 79,827	Cerebro-vascular disease 81,841	Intentional self-harm (suicide) 1,352	Assault (homicide) 613	Assault (homicide) 8,170	Heart diseases 2,508	Accidents (unintentional injuries) 25,401	Accidents (unintentional injuries) 11,208	Chronic lower respiratory diseases 30,237	Chronic lower respiratory diseases 29,321	Cerebro-vascular disease 25,747	Cerebro-vascular disease 55,234
4	Chronic lower respiratory diseases 61,235	Chronic lower respiratory diseases 66,689	Cancer 1,085	Congenital anomalies 518	Heart diseases 5,351	Intentional self-harm (suicide) 2,058	Intentional self-harm (suicide) 10,828	Cerebro-vascular disease 5,524	Cerebro-vascular disease 20,454	Cerebro-vascular disease 20,281	Chronic lower respiratory diseases 25,616	Alzheimer disease 45,458
5	Cerebro-vascular disease 54,111	Alzheimer disease 52,832	Congenital anomalies 593	Heart diseases 315	Cancer 4,041	Assault (homicide) 1,534	Chronic liver disease & cirrhosis 10,296	Diabetes mellitus 4,769	Diabetes mellitus 16,722	Diabetes mellitus 14,621	Alzheimer disease 16,780	Chronic lower respiratory diseases 32,524
6	Diabetes mellitus 35,478	Accidents (unintentional injuries) 43,879	Heart diseases 445	Intentional self-harm (suicide) 313	HIV disease 1,650	HIV disease 950	Diabetes mellitus 7,304	Chronic lower respiratory diseases 4,475	Accidents (unintentional injuries) 12,311	Nephritis, nephrotic syndrome & nephrosis 7,935	Influenza & pneumonia 14,099	Influenza & pneumonia 20,555
7	Intentional self-harm (suicide) 27,269	Diabetes mellitus 35,904	Chronic lower respiratory diseases 151	Influenza & pneumonia 134	Diabetes mellitus 905	Cerebro-vascular disease 636	Cerebro-vascular disease 7,006	Chronic liver disease & cirrhosis 4,229	Nephritis, nephrotic syndrome & nephrosis 8,665	Accidents (unintentional injuries) 7,457	Nephritis, nephrotic syndrome & nephrosis 10,868	Diabetes mellitus 15,909
8	Influenza & pneumonia 24,071	Influenza & pneumonia 28,646	Influenza & pneumonia 130	Cerebro-vascular disease 109	Chronic liver disease & cirrhosis 765	Pregnancy, childbirth & puerperium 598	HIV disease 5,451	Intentional self-harm (suicide) 3,612	Influenza & pneumonia 7,046	Alzheimer disease 7,191	Diabetes mellitus 10,495	Nephritis, nephrotic syndrome & nephrosis 13,479
9	Nephritis, nephrotic syndrome & nephrosis 22,616	Nephritis, nephrotic syndrome & nephrosis 23,832	Septicemia 113	Chronic lower respiratory diseases 95	Cerebro-vascular disease 726	Diabetes mellitus 567	Chronic lower respiratory diseases 4,887	Septicemia 2,321	Chronic liver disease & cirrhosis 6,859	Septicemia 6,639	Accidents (unintentional injuries) 10,164	Accidents (unintentional injuries) 13,453
10	Alzheimer disease 21,800	Septicemia 18,989	Cerebro-vascular disease 97	Septicemia 92	Congenital anomalies 490	Chronic liver disease & cirrhosis 388	Viral hepatitis 3,463	Nephritis, nephrotic syndrome & nephrosis 2,036	Septicemia 6,608	Influenza & pneumonia 5,997	Parkinson disease 7,422	Hypertension & hypertensive renal disease* 10,126

\*Includes primary and secondary hypertension.

Note: Deaths within each age group do not sum to all ages combined due to the inclusion of unknown ages. In accordance with the National Center for Health Statistics' cause-of-death ranking, "Symptoms, signs, and abnormal clinical or laboratory findings" and categories that begin with "Other" and "All other" were not ranked.

Source: US Mortality Data, 2007, National Center for Health Statistics, Centers for Disease Control and Prevention.



**FIGURE 6. Death Rates\* For Cancer and Heart Disease for Ages Younger Than 85 Years and 85 Years and Older, 1975 to 2006.**

\*Rates are age adjusted to the 2000 US standard population. Source: US Mortality Data, 1975 to 2006. National Center for Health Statistics, Centers for Disease Control and Prevention.

each sex. Death rates from all cancers combined peaked in 1990 for men and in 1991 for women. Between 1990-1991 and 2006, death rates for cancer decreased by 21.0% among men and by 12.3% among women. Among men, reduction in death rates from lung, prostate, and colorectal cancers accounted for nearly 80% of the total decrease in the cancer death rate, whereas reduction in death rates from breast and colorectal cancers accounted for 60% of the decrease noted among women. Lung cancer in men and breast cancer in women each account for nearly 40% of the sex-specific decreases in cancer death rates. The decrease in lung cancer death rates among men is due to a reduction in tobacco use over the past 50 years, whereas the decrease in death rates for female breast, colorectal, and prostate cancer largely reflects improvements in early detection and/or treatment. Between 1990-1991 and 2006, death rates increased for liver cancer in both men and women, esophageal cancer and melanoma in

men, and lung and pancreatic cancer in women. Figure 7 shows the total number of cancer deaths avoided since death rates began to decrease in 1991 in men and in 1992 in women. Approximately 767,000 cancer deaths (561,400 in men and 205,700 in women) were averted between 1991-1992 and 2006.

### Recorded Number of Deaths from Cancer in 2007

A total of 562,875 cancer deaths were recorded in the United States in 2007, the most recent year for which actual data are available, accounting for approximately 23% of all deaths (Table 7). Despite a decrease in age-standardized death rates, from 180.7 in 2006 to 178.4 in 2007, there were 2987 more cancer deaths reported in 2007 than in 2006 due to the influence of the aging and growth of the population (Table 8). When causes of death are ranked within 20-year age groups, cancer is one of the 5 leading causes of death in

TABLE 10. Reported Deaths for the Five Leading Cancer Sites by Age and Sex, United States, 2007

ALL AGES	<20	20 TO 39	40 TO 59	60 TO 79	≥ 80
MALE					
ALL SITES 292,857	ALL SITES 1,124	ALL SITES 4,041	ALL SITES 54,054	ALL SITES 152,231	ALL SITES 81,403
Lung & bronchus 88,331	Leukemia 365	Leukemia 522	Lung & bronchus 15,174	Lung & bronchus 53,125	Lung & bronchus 19,751
Prostate 29,093	Brain & ONS* 260	Brain & ONS* 502	Colorectum 5,434	Colorectum 13,370	Prostate 15,670
Colorectum 27,005	Bones & joints 92	Colorectum 395	Liver & bile duct 3,944	Prostate 12,187	Colorectum 7,795
Pancreas 17,132	Other endocrine system 92	Non-Hodgkin lymphoma 301	Pancreas 3,638	Pancreas 9,293	Urinary bladder 4,216
Leukemia 12,435	Soft tissue 72	Lung & bronchus 268	Esophagus 2,695	Esophagus 5,958	Pancreas 4,084
FEMALE					
ALL SITES 270,018	ALL SITES 944	ALL SITES 4,639	ALL SITES 50,640	ALL SITES 126,918	ALL SITES 86,873
Lung & bronchus 70,355	Leukemia 278	Breast 1,094	Breast 11,630	Lung & bronchus 40,187	Lung & bronchus 18,519
Breast 40,599	Brain & ONS* 261	Uterine cervix 468	Lung & bronchus 11,412	Breast 16,900	Colorectum 11,298
Colorectum 26,216	Other endocrine system 81	Leukemia 393	Colorectum 4,150	Colorectum 10,459	Breast 10,973
Pancreas 16,985	Bones & joints 80	Colorectum 304	Ovary 3,151	Pancreas 8,211	Pancreas 6,283
Ovary 14,621	Soft tissue 68	Brain & ONS* 300	Pancreas 2,417	Ovary 7,195	Non-Hodgkin lymphoma 4,171

\*ONS = Other nervous system.

Note: Deaths within each age group do not sum to all ages combined due to the inclusion of unknown ages. "Other and unspecified malignant neoplasm" is excluded from cause of death ranking order.

Source: US Mortality Data, 2007, National Center for Health Statistics, Centers for Disease Control and Prevention.

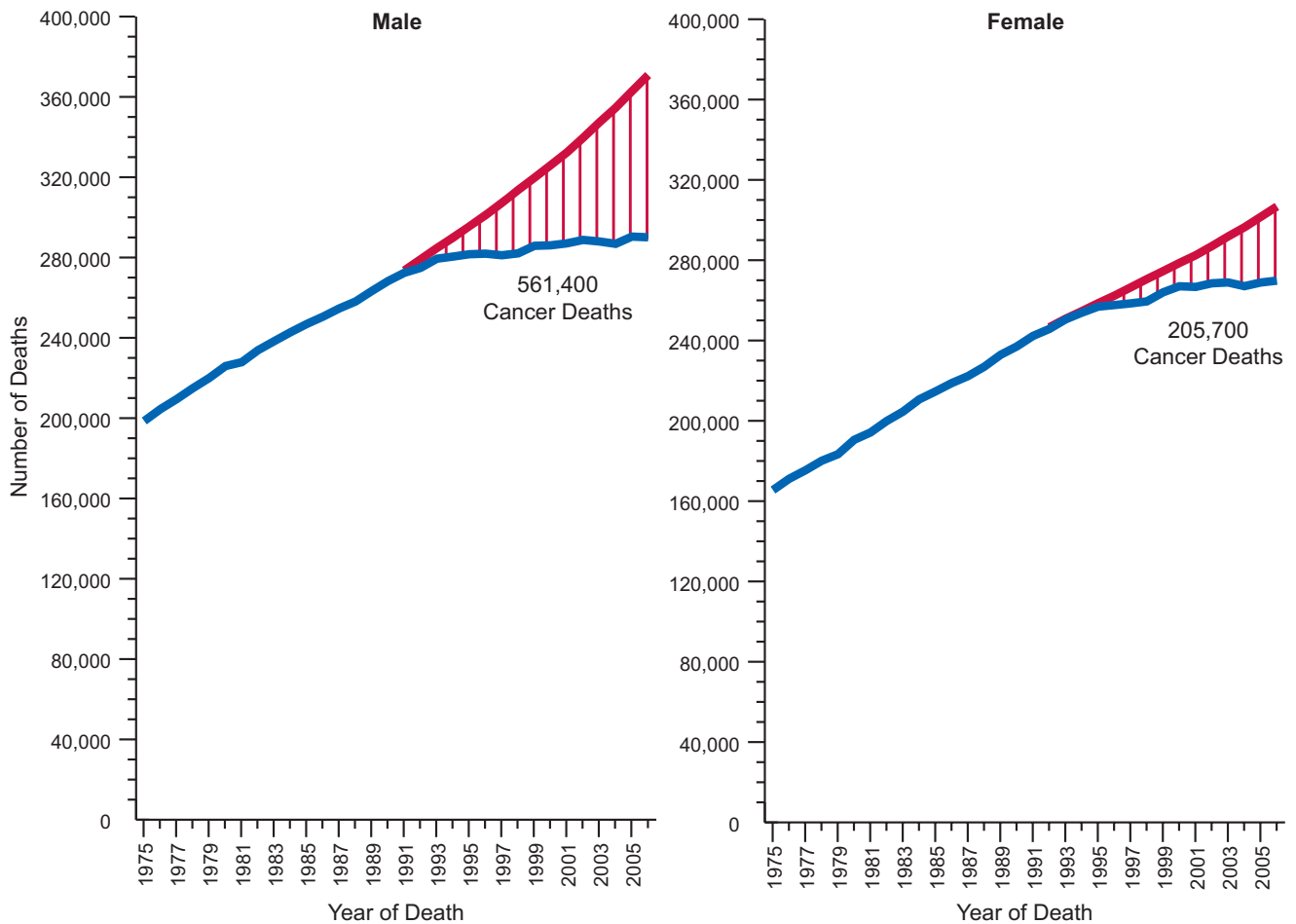
all age groups among both males and females; it is the leading cause of death among men and women ages 40 to 79 years (Table 9). Cancer is the leading cause of death among men and women aged younger than 85 years (Fig. 6). A total of 475,211 persons aged younger than 85 years died from cancer in the United States in 2007, compared with 380,791 deaths from heart disease, which is the leading cause of death overall in the United States.<sup>1</sup>

Table 10 presents the number of deaths from all cancers combined and from the 5 most common cancer sites for each 20-year age group. Among males aged younger than 40 years, leukemia is the most common fatal cancer, whereas cancer of the lung and bronchus predominates in men aged 40 years and older.

Colorectal cancer is the second most common cause of cancer death among men ages 40 to 79 years, and prostate cancer among men aged 80 years and older. Among females, leukemia is the leading cause of cancer death before age 20 years, breast cancer ranks first at ages 20 to 59 years, and lung cancer ranks first at ages 60 years and older.

## Cancer Occurrence by Race/Ethnicity

Cancer incidence and death rates vary considerably among racial and ethnic groups (Table 11), although the extent of variation may be affected by misclassification of race and ethnicity on medical records, including



**FIGURE 7. Total Number of Cancer Deaths Avoided From 1991 to 2006 in Males and From 1992 to 2006 in Females.**

The blue line represents the actual number of cancer deaths recorded in each year, and the bold red line represents the expected number of cancer deaths if cancer mortality rates had remained the same since 1990 and 1991.

death certificates.<sup>26</sup> For all cancer sites combined, African American men have a 14% higher incidence rate and a 34% higher death rate than white men, whereas African American women have a 7% lower incidence rate, but a 17% higher death rate than white women. For the specific cancer sites listed in Table 11, incidence and death rates are consistently higher in African Americans compared with whites except for cancers of the breast (incidence) and lung (incidence and mortality) among women, and kidney (mortality) among both men and women. Factors known to contribute to racial disparities in mortality vary by cancer site and include differences in exposure to underlying risk factors (eg, historical smoking prevalence for lung cancer among men), access to high-quality screening (breast, cervical, and colorectal cancers), and timely diagnosis and treatment. The higher breast cancer incidence rates observed among white women are believed to reflect a combination of factors that affect both diagnosis (eg, more frequent

mammography in white women) and underlying disease occurrence (eg, later age at first birth and greater use of menopausal hormone therapy among white compared with black women).<sup>21</sup>

Cancer incidence and death rates are lower in other racial and ethnic groups than in whites and African Americans for all cancer sites combined and for the 4 most common cancer sites. However, incidence and death rates for cancer sites related to infectious agents, such as those of the uterine cervix, stomach, and liver, are generally higher in minority populations than in whites. Stomach and liver cancer incidence and death rates are twice as high in Asian American/Pacific Islanders compared with whites, reflecting an increased prevalence of chronic infection with *Helicobacter pylori* and hepatitis B and C viruses, respectively, in this population.<sup>22</sup> Kidney cancer death rates are the highest among American Indians/Alaskan Natives; the higher prevalence of obesity and smoking in this population may contribute to this disparity.<sup>16</sup>

TABLE 11. Incidence and Death Rates\* by Site, Race, and Ethnicity, United States, 2002-2006

	WHITE	AFRICAN AMERICAN	ASIAN AMERICAN AND PACIFIC ISLANDER	AMERICAN INDIAN AND ALASKA NATIVE†	HISPANIC/ LATINO‡
<b>Incidence</b>					
<b>All sites</b>					
Male	550.1	626.0	334.5	318.4	430.3
Female	420.0	389.5	276.3	265.1	326.8
<b>Breast (female)</b>	123.5	113.0	81.6	67.2	90.2
<b>Colorectum</b>					
Male	58.2	68.4	44.1	38.1	50.0
Female	42.6	51.7	33.1	30.7	35.1
<b>Kidney &amp; renal pelvis</b>					
Male	19.7	20.6	9.0	16.6	18.2
Female	10.3	10.6	4.5	10.6	10.3
<b>Liver &amp; bile duct</b>					
Male	8.0	12.5	21.4	8.9	15.9
Female	2.8	3.8	8.1	4.6	6.2
<b>Lung &amp; bronchus</b>					
Male	85.9	104.8	50.6	57.9	49.2
Female	57.1	50.7	27.6	41.3	26.5
<b>Prostate</b>	146.3	231.9	82.3	82.7	131.1
<b>Stomach</b>					
Male	8.9	16.7	17.5	9.4	14.3
Female	4.2	8.5	9.8	4.7	8.6
<b>Uterine cervix</b>	7.9	11.1	7.6	6.6	12.7
<b>Mortality</b>					
<b>All sites</b>					
Male	226.7	304.2	135.4	183.3	154.8
Female	157.3	183.7	95.1	140.1	103.9
<b>Breast (female)</b>	23.9	33.0	12.5	17.6	15.5
<b>Colorectum</b>					
Male	21.4	31.4	13.8	20.0	16.1
Female	14.9	21.6	10.0	13.7	10.7
<b>Kidney &amp; renal pelvis</b>					
Male	6.1	6.0	2.4	9.0	5.2
Female	2.8	2.7	1.2	4.2	2.4
<b>Liver &amp; bile duct</b>					
Male	6.8	10.8	15.0	10.3	11.3
Female	2.9	3.9	6.6	6.5	5.1
<b>Lung &amp; bronchus</b>					
Male	69.9	90.1	36.9	48.0	33.9
Female	41.9	40.0	18.2	33.5	14.4
<b>Prostate</b>	23.6	56.3	10.6	20.0	19.6
<b>Stomach</b>					
Male	4.8	11.0	9.6	9.8	8.3
Female	2.4	5.3	5.8	4.6	4.8
<b>Uterine cervix</b>	2.2	4.6	2.2	3.4	3.1

\*Per 100,000 population, age adjusted to the 2000 US standard population.

†Data based on Contract Health Service Delivery Areas, comprising about 55% of the US American Indian/Alaska Native population; for more information please see: Espey DK, et al.<sup>16</sup>

‡Persons of Hispanic/Latino origin may be of any race.

Source: Edwards, et al.<sup>15</sup>

Trends in cancer incidence can be adjusted for delayed reporting only in whites and African Americans because the long-term incidence data required for delay adjustment are not available for other racial and ethnic subgroups. From 1997 through 2006, incidence (unadjusted for delayed reporting) and death rates for all cancer sites combined

decreased among whites, African Americans, Asian Americans/Pacific Islanders, and Hispanics in both males and females. Among American Indians/Alaska Natives residing in Indian Health Service Contract Health Service Delivery Areas, incidence and mortality rates decreased in men but remained stable in women during this time period.<sup>15</sup>

TABLE 12. Probability of Developing Invasive Cancers Within Selected Age Intervals by Sex, United States, 2004-2006\*

		BIRTH TO 39 (%)	40 TO 59 (%)	60 TO 69 (%)	70 AND OLDER (%)	BIRTH TO DEATH (%)
<b>All sites†</b>	Male	1.43 (1 in 70)	8.42 (1 in 12)	15.61 (1 in 6)	37.84 (1 in 3)	44.05 (1 in 2)
	Female	2.10 (1 in 48)	8.97 (1 in 11)	10.18 (1 in 10)	26.47 (1 in 4)	37.63 (1 in 3)
<b>Urinary bladder‡</b>	Male	0.02 (1 in 4,741)	0.39 (1 in 257)	0.95 (1 in 106)	3.66 (1 in 27)	3.81 (1 in 26)
	Female	0.01 (1 in 10,613)	0.12 (1 in 815)	0.26 (1 in 385)	1.01 (1 in 99)	1.18 (1 in 84)
<b>Breast</b>	Female	0.49 (1 in 206)	3.75 (1 in 27)	3.40 (1 in 29)	6.50 (1 in 15)	12.08 (1 in 8)
<b>Colorectum</b>	Male	0.08 (1 in 1,269)	0.91 (1 in 110)	1.48 (1 in 67)	4.50 (1 in 22)	5.39 (1 in 19)
	Female	0.08 (1 in 1,300)	0.72 (1 in 139)	1.07 (1 in 94)	4.09 (1 in 24)	5.03 (1 in 20)
<b>Leukemia</b>	Male	0.17 (1 in 603)	0.21 (1 in 475)	0.33 (1 in 299)	1.19 (1 in 84)	1.51 (1 in 66)
	Female	0.13 (1 in 798)	0.15 (1 in 690)	0.20 (1 in 504)	0.78 (1 in 128)	1.08 (1 in 92)
<b>Lung &amp; bronchus</b>	Male	0.03 (1 in 3,461)	0.95 (1 in 105)	2.35 (1 in 43)	6.71 (1 in 15)	7.73 (1 in 13)
	Female	0.03 (1 in 3,066)	0.79 (1 in 126)	1.75 (1 in 57)	4.83 (1 in 21)	6.31 (1 in 16)
<b>Melanoma of the skin§</b>	Male	0.16 (1 in 638)	0.64 (1 in 155)	0.72 (1 in 138)	1.77 (1 in 56)	2.67 (1 in 37)
	Female	0.28 (1 in 360)	0.55 (1 in 183)	0.36 (1 in 274)	0.79 (1 in 126)	1.79 (1 in 56)
<b>Non-Hodgkin lymphoma</b>	Male	0.13 (1 in 782)	0.44 (1 in 225)	0.59 (1 in 171)	1.71 (1 in 58)	2.28 (1 in 44)
	Female	0.09 (1 in 1,172)	0.32 (1 in 315)	0.44 (1 in 227)	1.39 (1 in 72)	1.92 (1 in 52)
<b>Prostate</b>	Male	0.01 (1 in 9,422)	2.44 (1 in 41)	6.45 (1 in 16)	12.48 (1 in 8)	15.90 (1 in 6)
<b>Uterine cervix</b>	Female	0.15 (1 in 648)	0.27 (1 in 374)	0.13 (1 in 755)	0.19 (1 in 552)	0.69 (1 in 145)
<b>Uterine corpus</b>	Female	0.07 (1 in 1,453)	0.73 (1 in 136)	0.83 (1 in 121)	1.23 (1 in 81)	2.53 (1 in 40)

\*For people free of cancer at beginning of age interval.

†All sites excludes basal and squamous cell skin cancers and in situ cancers except urinary bladder.

‡Includes invasive and in situ cancer cases

§Statistics for whites only.

**Source:** DevCan: Probability of Developing or Dying of Cancer Software, Version 6.4.0. Statistical Research and Applications Branch, National Cancer Institute, 2009. [www.srab.cancer.gov/devcan](http://www.srab.cancer.gov/devcan)

## Lifetime Probability of Developing Cancer

The lifetime probability of being diagnosed with an invasive cancer is higher for men (44%) than women (38%) (Table 12). However, because of the earlier median age of diagnosis for breast cancer compared with other major cancers, women have a slightly higher probability of developing cancer before age 60 years. These estimates are based on the average experience of the general population and may overestimate or underestimate individual risk because of differences in exposure and/or genetic susceptibility.

## Cancer Survival By Race

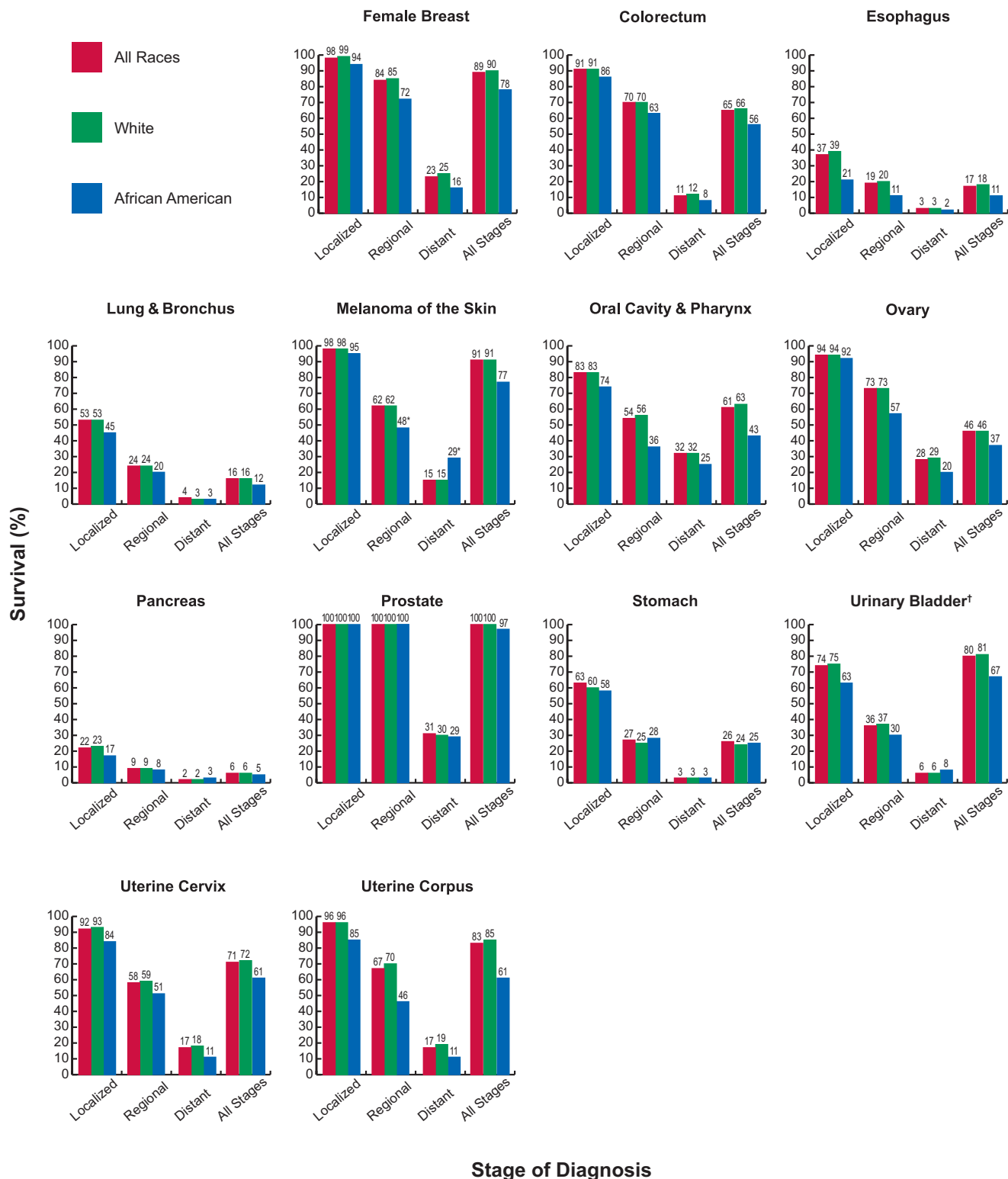
Compared with whites, African American men and women have poorer survival once cancer is diagnosed. The 5-year relative survival is lower in African Americans than in whites for every stage of diagnosis for nearly every cancer site (Fig. 8). These disparities may result from inequalities in access to and receipt of quality health care and/or from differences in comorbidities. As shown in Figure 9, African Americans are less likely than whites to be diagnosed with cancer at a localized stage, when the disease may be more easily and successfully treated. The extent to which factors

other than stage at diagnosis contribute to the overall differential survival is unclear.<sup>23</sup> However, some studies suggest that African Americans who receive cancer treatment and medical care similar to that of whites experience similar outcomes.<sup>24</sup>

There have been notable improvements since 1975 in the relative 5-year survival rates for many cancer sites for both whites and African Americans (Table 13). Cancers for which survival has not improved substantially over the past 30 years include those of the lung and pancreas. The improvement in survival reflects a combination of earlier diagnosis and improved treatments.

Relative survival rates cannot be calculated for racial and ethnic populations other than whites and African Americans because accurate life expectancies (the average number of years of life remaining for persons who have attained a given age) are not available. However, based on cause-specific survival rates of cancer patients diagnosed between 1999 and 2005 in SEER areas of the United States, all minority male populations have a greater probability of dying from cancer within 5 years of diagnosis than whites. Among women, African Americans have the lowest 5-year, cancer-specific survival (55.8%), followed by American Indians/Alaska Natives (60.0%), whites (65.5%), Hispanics (66.4%), and Asians/Pacific Islanders (68.0%).<sup>2</sup> For all 4

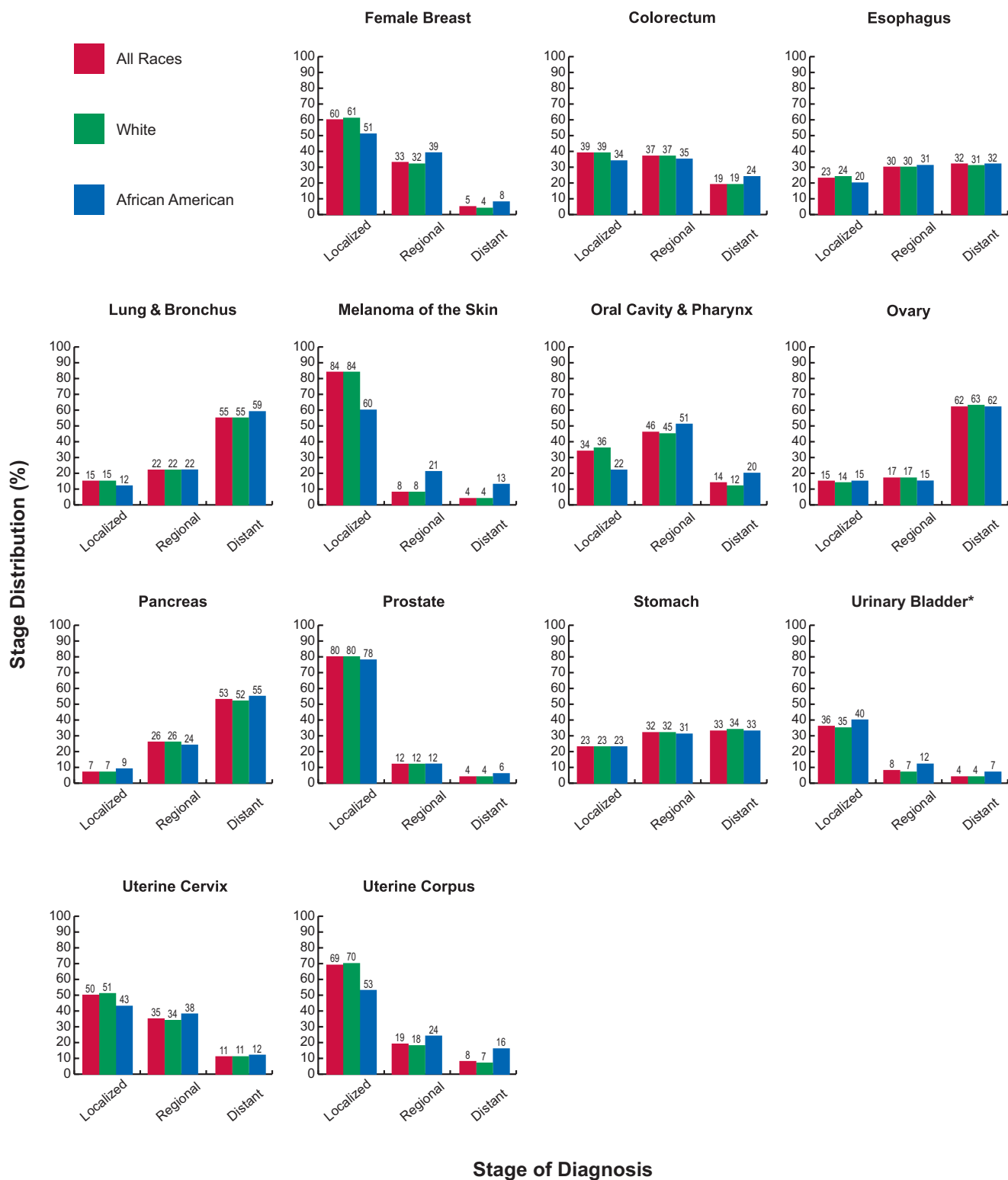




**FIGURE 8. Five-Year Relative Survival Rates Among Patients Diagnosed with Selected Cancers by Race and Stage at Diagnosis, United States, 1999 to 2005.**

\*The standard error of the survival rate is between 5 and 10 percentage points.

†The survival rate for in situ urinary bladder cancer is 97% for all races combined, whites, and African Americans. Staging was performed according to Surveillance, Epidemiology, and End Results (SEER) historic stage categories rather than the American Joint Committee on Cancer (AJCC) staging system. Source: Horner MJ, Ries LAG, Krapcho M, et al.<sup>2</sup>



**FIGURE 9. Distribution of Selected Cancers by Race and Stage at Diagnosis, United States, 1999 to 2005.**

\*The proportion of in situ urinary bladder cancer cases is 50%, 51%, and 36% in all races combined, whites, and African Americans, respectively. Staging was performed according to Surveillance, Epidemiology, and End Results (SEER) historic stage categories rather than the American Joint Committee on Cancer (AJCC) staging system. For each cancer type, stage categories do not total 100% because sufficient information is not available to assign a stage to all cancer cases. Source: Horner MJ, Ries LAG, Krapcho M, et al.<sup>2</sup>

**TABLE 13. Trends in 5-Year Relative Survival Rates\* (%) by Race and Year of Diagnosis, United States, 1975-2005**

	ALL RACES			WHITE			AFRICAN AMERICAN		
	1975 TO 1977	1984 TO 1986	1999 TO 2005	1975 TO 1977	1984 TO 1986	1999 TO 2005	1975 TO 1977	1984 TO 1986	1999 TO 2005
All sites	50	54	68†	51	55	69†	40	41	59†
Brain	24	29	36†	23	28	35†	27	32	41†
Breast (female)	75	79	90†	76	80	91†	62	65	79†
Colon	52	59	66†	52	60	67†	46	50	56†
Esophagus	5	10	19†	6	11	20†	3	8	13†
Hodgkin lymphoma	74	79	86†	74	80	87†	71	75	81†
Kidney	51	56	69†	51	56	69†	50	54	66†
Larynx	67	66	63†	67	68	66	59	53	50
Leukemia	35	42	54†	36	43	55†	34	34	46†
Liver & bile duct	4	6	14†	4	6	13†	2	5	10†
Lung & bronchus	13	13	16†	13	14	17†	12	11	13†
Melanoma of the skin	82	87	93†	82	87	93†	60‡	70§	78‡
Myeloma	26	29	37†	25	27	38†	31	32	36†
Non-Hodgkin lymphoma	48	53	69†	48	54	70†	49	48	60†
Oral cavity	53	55	63†	55	57	64†	36	36	46†
Ovary	37	40	46†	37	39	46†	43	41	37
Pancreas	3	3	6†	3	3	6†	2	5	5†
Prostate	69	76	100†	70	77	100†	61	66	98†
Rectum	49	57	69†	49	58	69†	45	46	61†
Stomach	16	18	27†	15	18	25†	16	20	26†
Testis	83	93	96†	83	93	97†	73‡#	87‡	87
Thyroid	93	94	97†	93	94	98†	91	90	96
Urinary bladder	74	78	82†	75	79	83†	51	61	68†
Uterine cervix	70	68	72†	71	70	73	65	58	65
Uterine corpus	88	84	84†	89	85	87†	61	58	62

\*Survival rates are adjusted for normal life expectancy and are based on cases diagnosed in the SEER 9 areas from 1975-77, 1984-86, and 1999-2005 and followed through 2006.

†The difference in rates between 1975-1977 and 1999-2005 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.

#Survival rate is for 1978-1980.

Source: Horner MJ, Ries LAG, Krapcho M, et al.<sup>2</sup>

**TABLE 14. Ten Leading Causes of Death Among Children Ages 1 to 14, United States, 2007**

RANK	CAUSE OF DEATH	NUMBER OF DEATHS	% OF TOTAL DEATHS	DEATH RATE*
	ALL CAUSES	10,850	100.0	18.9
1	Accidents (unintentional injuries)	3,782	34.9	6.6
2	Cancer	1,323	12.2	2.3
3	Congenital anomalies	920	8.5	1.6
4	Assault (homicide)	744	6.9	1.3
5	Heart diseases	414	3.8	0.7
6	Influenza & pneumonia	212	2.0	0.4
7	Intentional self-harm (suicide)	184	1.7	0.3
8	Chronic lower respiratory diseases	175	1.6	0.3
9	Septicemia	152	1.4	0.3
10	In situ, benign, & unknown neoplasms	143	1.3	0.3
	All other causes	2,801	25.8	

\*Rates are per 100,000 population and age adjusted to the 2000 US standard population.

Note: 'Symptoms, signs, and abnormal clinical or laboratory findings' and 'Other respiratory diseases' were excluded from ranking order.

Source: US Mortality Data, 2007. National Center for Health Statistics, Centers for Disease Control and Prevention.

TABLE 15. Trends in Five-year Relative Survival Rates\* (%) for Children Under Age 15, US, 1975 to 2005

SITE	YEAR OF DIAGNOSIS								
	1975 TO 1977	1978 TO 1980	1981 TO 1983	1984 TO 1986	1987 TO 1989	1990 TO 1992	1993 TO 1995	1996 TO 1998	1999 TO 2005
All sites	58	63	67	68	72	76	77	79	81†
Acute lymphocytic leukemia	58	66	71	73	78	83	84	87	89†
Acute myeloid leukemia	19	26	27‡	31‡	37‡	41	42‡	49	60†
Bone & joint	50‡	48	57‡	58‡	67‡	67	74	70	72†
Brain & other nervous system	57	58	56	62	64	64	70	75	74†
Hodgkin lymphoma	81	88	88	91	87	97	95	96	95†
Neuroblastoma	52	57	55	52	62	76	67	66	74†
Non-Hodgkin lymphoma	44	53	67	70	71	76	81	83	86†
Soft tissue	61	75	69	73	66	80	77	70	81†
Wilms tumor	73	79	87	91	92	92	92	92	91†

\*Survival rates are adjusted for normal life expectancy and are based on follow-up of patients through 2006.

†The difference in rates between 1975 to 1977 and 1999 to 2005 is statistically significant ( $P < 0.05$ ).

‡The standard error of the survival rate is between 5 and 10 percentage points.

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

Source: Horner MJ, Ries LAG, Krapcho M, et al.<sup>2</sup>

major cancer sites (prostate, female breast, lung and bronchus, and colorectum), minority populations are generally more likely to be diagnosed at distant stage, compared with whites (Fig. 9).<sup>25</sup>

## Cancer in Children

Cancer is the second most common cause of death among children between the ages of 1 and 14 years in the United States, surpassed only by accidents (Table 14). Nearly one-third of the cancers diagnosed in children ages birth to 14 years are leukemias (particularly acute lymphocytic leukemia), followed by cancer of the brain and other nervous system (21%), soft tissue sarcomas (including neuroblastoma [7%] and rhabdomyosarcoma [3%]), renal (Wilms) tumors (5%), and non-Hodgkin lymphoma (4%). Over the past 25 years, there have been significant improvements in the 5-year relative survival rate for all of the major childhood cancers (Table 15). The 5-year relative survival rate among children for all cancer sites combined improved from 58% for patients diagnosed between 1975 and 1977 to 81% for those diagnosed between 1999 and 2005.<sup>2</sup>

## Limitations

Estimates of the expected numbers of new cancer cases and cancer deaths should be interpreted cautiously

because these estimates are based on models and may vary considerably from year to year. Estimates are also affected by changes in method. The introduction of a new method for projecting incident cancer cases beginning with the 2007 estimates substantially affected the estimates for several cancers, particularly leukemia and female breast.<sup>12</sup> Not all changes in cancer trends are captured by modeling techniques and sometimes the model may be too sensitive to recent trends, resulting in over- or underestimates. For these reasons, we discourage the use of these estimates to track year-to-year changes in cancer occurrence and death. The preferred data sources for tracking cancer trends are age-standardized or age-specific cancer incidence rates from SEER or NPCR and cancer death rates from the NCHS. Nevertheless, the American Cancer Society estimates of the number of new cancer cases and deaths in the current year provide reasonably accurate estimates of the burden of new cancer cases and deaths in the United States.

Errors in reporting race/ethnicity in medical records and death certificates may result in underestimates of cancer incidence and mortality rates in nonwhite and nonblack populations. It is also important to note that cancer data in the United States are primarily reported for broad racial and ethnic minority groups that are not homogenous, and thus significant differences in the cancer burden within racial/ethnic subgroups may be masked.<sup>26</sup> ■

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