Cancer Statistics, 2015

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Each year the American Cancer Society estimates the numbers of new cancer cases and deaths that will occur in the United States in the current year and compiles the most recent data on cancer incidence, mortality, and survival. Incidence data were collected by the National Cancer Institute (Surveillance, Epidemiology, and End Results [SEER] Program), the Centers for Disease Control and Prevention (National Program of Cancer Registries), and the North American Association of Central Cancer Registries. Mortality data were collected by the National Center for Health Statistics. A total of 1,658,370 new cancer cases and 589,430 cancer deaths are projected to occur in the United States in 2015. During the most recent 5 years for which there are data (2007-2011), delay-adjusted cancer incidence rates (13 oldest SEER registries) declined by 1.8% per year in men and were stable in women, while cancer death rates nationwide decreased by 1.8% per year in men and by 1.4% per year in women. The overall cancer death rate decreased from 215.1 (per 100,000 population) in 1991 to 168.7 in 2011, a total relative decline of 22%. However, the magnitude of the decline varied by state, and was generally lowest in the South (∼15%) and highest in the Northeast (≥20%). For example, there were declines of 25% to 30% in Maryland, New Jersey, Massachusetts, New York, and Delaware, which collectively averted 29,000 cancer deaths in 2011 as a result of this progress. Further gains can be accelerated by applying existing cancer control knowledge across all segments of the population. **CA Cancer J Clin 2015;000:000-000.**

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Introduction

Cancer is a major public health problem in the United States and many other parts of the world. It is currently the second leading cause of death in the United States, and is expected to surpass heart diseases as the leading cause of death in the next few years. In this article, we provide the expected numbers of new cancer cases and deaths in 2015 in the United States nationally and for each state, as well as a comprehensive overview of cancer incidence, mortality, and survival rates and trends using the most current population-based data. In addition, we estimate the total number of deaths averted nationally during the past 2 decades and by state in 2011 as a result of the continual decline in cancer death rates. We also present the actual number of deaths reported in 2011 by age for the 10 leading causes of death and for the 5 leading causes of cancer death.

Materials and Methods

Incidence and Mortality Data

Mortality data from 1930 to 2011 were obtained from the National Center for Health Statistics (NCHS).[1] Forty-seven states and the District of Columbia met data quality requirements for reporting to the national vital statistics system in 1930. Texas, Alaska, and Hawaii began reporting mortality data in 1933, 1959, and 1960, respectively. The methods for abstraction and age adjustment of mortality data are described elsewhere.[2,3]

Population-based cancer incidence data in the United States have been collected by the National Cancer Institute's (NCI's) Surveillance, Epidemiology, and End Results (SEER) Program since 1973 and by the Centers for Disease Control and Prevention's National Program of Cancer Registries (NPCR) since 1995. The SEER program is the only source for long-term, delay-adjusted, population-based incidence data. Long-term incidence and survival trends (1975-2011) were based on data from the 9 oldest SEER areas (Connecticut, Hawaii, Iowa, New Mexico, Utah, and the metropolitan areas of Atlanta, Detroit, San Francisco-Oakland, and Seattle-Puget Sound), representing approximately 9% of the US population.[4]

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TABLE 1. Estimated New Cancer Cases and Deaths by Sex, United States, 2015*

	ESTIMATED NEW CASES			ESTIMATED DEATHS		
	BOTH SEXES	MALE	FEMALE	BOTH SEXES	MALE	FEMALE
All sites	**1,658,370**	**848,200**	**810,170**	**589,430**	**312,150**	**277,280**
Oral cavity & pharynx	**45,780**	**32,670**	**13,110**	**8,650**	**6,010**	**2,640**
Tongue	14,320	10,310	4,010	2,190	1,500	690
Mouth	12,920	7,750	5,170	2,120	1,200	920
Pharynx	15,520	12,380	3,140	2,660	2,010	650
Other oral cavity	3,020	2,230	790	1,680	1,300	380
Digestive system	**291,150**	**163,050**	**128,100**	**149,300**	**86,540**	**62,760**
Esophagus	16,980	13,570	3,410	15,590	12,600	2,990
Stomach	24,590	15,540	9,050	10,720	6,500	4,220
Small intestine	9,410	4,960	4,450	1,260	670	590
Colon†	93,090	45,890	47,200	49,700	26,100	23,600
Rectum	39,610	23,200	16,410			
Anus, anal canal, & anorectum	7,270	2,640	4,630	1,010	400	610
Liver & intrahepatic bile duct	35,660	25,510	10,150	24,550	17,030	7,520
Gallbladder & other biliary	10,910	4,990	5,920	3,700	1,660	2,040
Pancreas	48,960	24,840	24,120	40,560	20,710	19,850
Other digestive organs	4,670	1,910	2,760	2,210	870	1,340
Respiratory system	**240,390**	**130,260**	**110,130**	**162,460**	**89,750**	**72,710**
Larynx	13,560	10,720	2,840	3,640	2,890	750
Lung & bronchus	221,200	115,610	105,590	158,040	86,380	71,660
Other respiratory organs	5,630	3,930	1,700	780	480	300
Bones & joints	**2,970**	**1,640**	**1,330**	**1,490**	**850**	**640**
Soft tissue (including heart)	**11,930**	**6,610**	**5,320**	**4,870**	**2,600**	**2,270**
Skin (excluding basal & squamous)	**80,100**	**46,610**	**33,490**	**13,340**	**9,120**	**4,220**
Melanoma of the skin	73,870	42,670	31,200	9,940	6,640	3,300
Other nonepithelial skin	6,230	3,940	2,290	3,400	2,480	920
Breast	**234,190**	**2,350**	**231,840**	**40,730**	**440**	**40,290**
Genital system	**329,330**	**231,050**	**98,280**	**58,670**	**28,230**	**30,440**
Uterine cervix	12,900		12,900	4,100		4,100
Uterine corpus	54,870		54,870	10,170		10,170
Ovary	21,290		21,290	14,180		14,180
Vulva	5,150		5,150	1,080		1,080
Vagina & other genital, female	4,070		4,070	910		910
Prostate	220,800	220,800		27,540	27,540	
Testis	8,430	8,430		380	380	
Penis & other genital, male	1,820	1,820		310	310	
Urinary system	**138,710**	**96,580**	**42,130**	**30,970**	**21,110**	**9,860**
Urinary bladder	74,000	56,320	17,680	16,000	11,510	4,490
Kidney & renal pelvis	61,560	38,270	23,290	14,080	9,070	5,010
Ureter & other urinary organs	3,150	1,990	1,160	890	530	360
Eye & orbit	**2,580**	**1,360**	**1,220**	**270**	**140**	**130**
Brain & other nervous system	**22,850**	**12,900**	**9,950**	**15,320**	**8,940**	**6,380**
Endocrine system	**64,860**	**16,520**	**48,340**	**2,890**	**1,350**	**1,540**
Thyroid	62,450	15,220	47,230	1,950	870	1,080
Other endocrine	2,410	1,300	1,110	940	480	460
Lymphoma	**80,900**	**44,950**	**35,950**	**20,940**	**12,140**	**8,800**
Hodgkin lymphoma	9,050	5,100	3,950	1,150	660	490
Non-Hodgkin lymphoma	71,850	39,850	32,000	19,790	11,480	8,310
Myeloma	**26,850**	**14,090**	**12,760**	**11,240**	**6,240**	**5,000**
Leukemia	**54,270**	**30,900**	**23,370**	**24,450**	**14,210**	**10,240**
Acute lymphocytic leukemia	6,250	3,100	3,150	1,450	800	650
Chronic lymphocytic leukemia	14,620	8,140	6,480	4,650	2,830	1,820
Acute myeloid leukemia	20,830	12,730	8,100	10,460	6,110	4,350
Chronic myeloid leukemia	6,660	3,530	3,130	1,140	590	550
Other leukemia‡	5,910	3,400	2,510	6,750	3,880	2,870
Other & unspecified primary sites‡	**31,510**	**16,660**	**14,850**	**43,840**	**24,480**	**19,360**

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

About 60,290 cases of carcinoma in situ of the female breast and 63,440 cases of melanoma in situ will be newly diagnosed in 2015.

†Estimated deaths for colon and rectum cancers are combined due to a high percentage of misclassification.

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

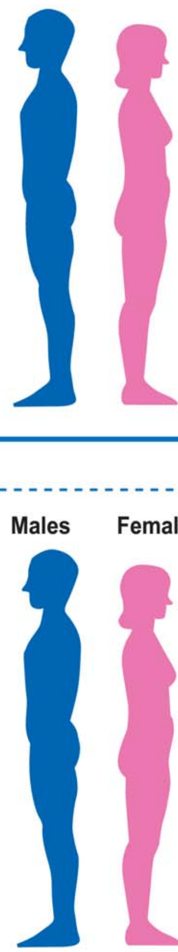
TABLE 2. Estimated New Cases for Selected Cancers by State, 2015*

STATE	ALL CASES	FEMALE BREAST	UTERINE CERVIX	COLON & RECTUM	UTERINE CORPUS	LEUKEMIA	LUNG & BRONCHUS	MELANOMA OF THE SKIN	NON-HODGKIN LYMPHOMA	PROSTATE	URINARY BLADDER
Alabama	26,150	3,680	230	2,150	660	730	4,150	1,380	1,020	3,590	1,000
Alaska	3,700	470	†	290	100	110	420	100	140	490	180
Arizona	32,440	4,750	200	2,440	940	950	3,740	1,400	1,300	4,090	1,580
Arkansas	15,830	2,090	150	1,420	420	480	2,620	360	670	2,050	630
California	172,090	25,270	1,490	14,510	5,800	5,970	18,430	8,560	7,870	21,060	7,150
Colorado	24,540	3,640	170	1,800	740	870	2,560	1,400	1,090	3,600	1,080
Connecticut	21,970	3,190	130	1,580	810	660	2,870	780	920	3,170	1,140
Delaware	5,280	780	†	400	180	160	860	280	220	740	250
Dist. of Columbia	2,800	430	†	230	100	70	310	80	100	490	80
Florida	114,040	15,470	980	9,330	3,550	3,930	16,810	5,480	5,340	15,480	5,670
Georgia	48,070	7,170	430	3,820	1,330	1,430	6,460	2,350	1,870	7,450	1,720
Hawaii	6,730	1,140	50	720	280	230	890	420	310	710	220
Idaho	8,080	1,070	†	620	240	300	910	470	380	1,270	410
Illinois	65,460	9,570	550	5,720	2,470	2,200	8,920	2,380	2,890	8,140	2,970
Indiana	35,620	4,600	280	2,890	1,180	1,100	5,510	1,460	1,490	4,040	1,590
Iowa	17,140	2,390	100	1,490	640	640	2,440	1,070	830	2,170	800
Kansas	14,440	2,130	90	1,080	500	480	1,930	850	640	1,860	620
Kentucky	26,490	3,300	220	2,090	730	820	4,680	1,530	1,030	3,040	1,070
Louisiana	24,100	2,900	220	2,150	570	690	3,380	540	950	3,980	910
Maine	8,810	1,010	50	610	340	320	1,360	320	390	1,100	540
Maryland	30,050	4,730	230	2,360	1,080	780	3,980	1,410	1,230	4,620	1,250
Massachusetts	37,790	5,890	210	2,550	1,460	1,130	5,150	1,310	1,620	5,420	2,000
Michigan	57,420	7,780	350	4,190	2,090	1,870	8,350	2,630	2,500	8,110	2,870
Minnesota	29,730	3,900	130	2,140	990	1,120	3,250	1,190	1,330	3,740	1,270
Mississippi	16,260	2,050	140	1,460	390	450	2,340	540	550	2,150	500
Missouri	34,680	4,610	260	2,840	1,120	1,100	5,380	1,510	1,450	3,900	1,500
Montana	5,950	830	†	500	190	200	760	300	270	1,000	310
Nebraska	9,540	1,230	60	850	340	320	1,200	500	450	1,190	440
Nevada	13,640	1,690	120	1,110	350	440	1,770	470	530	1,640	660
New Hampshire	8,090	1,120	†	540	310	260	1,140	280	350	1,080	450
New Jersey	51,410	7,310	410	4,260	1,850	1,610	5,830	2,520	2,310	7,270	2,530
New Mexico	9,970	1,320	80	820	300	360	990	480	410	1,290	390
New York	107,840	14,900	870	8,010	4,250	3,630	13,180	4,270	4,800	14,850	5,200
North Carolina	50,420	7,820	390	3,980	1,630	1,660	7,750	2,600	2,150	7,210	2,170
North Dakota	3,840	510	†	350	110	140	440	180	170	490	190
Ohio	65,010	8,950	450	5,430	2,410	1,930	10,000	2,790	2,790	8,150	3,040
Oklahoma	19,280	2,770	170	1,690	540	670	3,220	480	840	2,480	830
Oregon	22,410	3,280	130	1,510	740	720	2,830	1,480	960	3,110	1,090
Pennsylvania	81,540	9,990	540	6,300	3,000	2,560	10,540	3,880	3,410	10,050	4,080
Rhode Island	6,040	730	†	470	230	180	880	180	250	760	330
South Carolina	25,550	3,820	220	2,130	780	820	4,040	1,420	1,070	3,870	1,090
South Dakota	4,520	600	†	360	150	170	570	210	210	550	220
Tennessee	38,300	4,770	320	3,060	1,000	1,110	6,200	1,940	1,500	4,410	1,510
Texas	113,630	16,510	1,240	10,050	3,240	4,360	13,650	2,410	5,080	15,020	4,080
Utah	11,050	1,460	70	670	360	390	660	800	510	1,750	430
Vermont	4,020	530	†	280	150	110	570	150	170	470	210
Virginia	41,170	6,090	320	2,970	1,340	1,100	5,740	2,230	1,680	6,120	1,670
Washington	38,180	5,480	230	2,700	1,250	1,300	4,790	2,460	1,770	5,430	1,790
West Virginia	11,730	1,430	90	1,080	400	380	2,080	550	480	1,370	550
Wisconsin	32,700	4,310	190	2,460	1,160	1,190	4,370	1,330	1,460	4,310	1,610
Wyoming	2,860	390	†	230	90	100	320	160	120	460	140
United States	**1,658,370**	**231,840**	**12,900**	**132,700**	**54,870**	**54,270**	**221,200**	**73,870**	**71,850**	**220,800**	**74,000**

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

†Estimate is fewer than 50 cases.

Note: These are model-based estimates that should be interpreted with caution. State estimates may not add to US total due to rounding and the exclusion of states with fewer than 50 cases.



Estimated New Cases

Males			Females		
Prostate	220,800	26%	Breast	231,840	29%
Lung & bronchus	115,610	14%	Lung & bronchus	105,590	13%
Colon & rectum	69,090	8%	Colon & rectum	63,610	8%
Urinary bladder	56,320	7%	Uterine corpus	54,870	7%
Melanoma of the skin	42,670	5%	Thyroid	47,230	6%
Non-Hodgkin lymphoma	39,850	5%	Non-Hodgkin lymphoma	32,000	4%
Kidney & renal pelvis	38,270	5%	Melanoma of the skin	31,200	4%
Oral cavity & pharynx	32,670	4%	Pancreas	24,120	3%
Leukemia	30,900	4%	Leukemia	23,370	3%
Liver & intrahepatic bile duct	25,510	3%	Kidney & renal pelvis	23,290	3%
All Sites	**848,200**	**100%**	**All Sites**	**810,170**	**100%**

Estimated Deaths

Males			Females		
Lung & bronchus	86,380	28%	Lung & bronchus	71,660	26%
Prostate	27,540	9%	Breast	40,290	15%
Colon & rectum	26,100	8%	Colon & rectum	23,600	9%
Pancreas	20,710	7%	Pancreas	19,850	7%
Liver & intrahepatic bile duct	17,030	5%	Ovary	14,180	5%
Leukemia	14,210	5%	Leukemia	10,240	4%
Esophagus	12,600	4%	Uterine corpus	10,170	4%
Urinary bladder	11,510	4%	Non-Hodgkin lymphoma	8,310	3%
Non-Hodgkin lymphoma	11,480	4%	Liver & intrahepatic bile duct	7,520	3%
Kidney & renal pelvis	9,070	3%	Brain & other nervous system	6,380	2%
All Sites	**312,150**	**100%**	**All Sites**	**277,280**	**100%**

FIGURE 1. Ten Leading Cancer Types for the Estimated New Cancer Cases and Deaths by Sex, United States, 2015.
Estimates are rounded to the nearest 10 and cases exclude basal cell and squamous cell skin cancers and in situ carcinoma except urinary bladder.

As of 1992, SEER data have been available for 4 additional populations (Alaska Natives, Los Angeles county, San Jose-Monterey, and rural Georgia) that increase the coverage of minority groups, allowing for stratification by race and ethnicity.[5] Delay-adjusted data from these (SEER 13) registries, which represent 14% of the US population, were the source for the annual percent change in incidence from 1992 to 2011. The SEER program added 5 additional catchment areas beginning with cases diagnosed in 2000 (greater California, greater Georgia, Kentucky, Louisiana, and New Jersey), achieving 28% population coverage. Data from all 18 SEER areas were the source for cancer stage distribution, stage-specific survival, and the lifetime probability of developing cancer.[6] Much of the statistical information presented herein was adapted from data previously published in the *SEER Cancer Statistics Review, 1975-2011*.[7]

The North American Association of Central Cancer Registries (NAACCR) compiles and reports incidence data from 1995 onward for cancer registries that participate in the SEER program and/or the NPCR. (Five states receive funding from both programs). These data approach 100% coverage of the US population in the most recent time period and were the source for the projected new cancer cases in 2015, incidence rates by state and race/ethnicity, and the 5-year average annual percent change in incidence rates by race/ethnicity and for childhood and adolescent cancers.[8,9] Some of the data presented herein were previously published in volumes 1 and 2 of *Cancer in North America: 2007-2011*.[10,11]

All cancer cases were classified according to the *International Classification of Diseases for Oncology* except childhood and adolescent cancers, for which the International Classification of Childhood Cancer (ICCC) was used.[12] The lifetime

TABLE 3. Estimated Deaths for Selected Cancers by State, 2015*

STATE	ALL SITES	BRAIN & OTHER NERVOUS SYSTEM	FEMALE BREAST	COLON & RECTUM	LEUKEMIA	LIVER & INTRAHEPATIC BILE DUCT	LUNG & BRONCHUS	NON-HODGKIN LYMPHOMA	OVARY	PANCREAS	PROSTATE
Alabama	10,560	290	680	930	420	360	3,280	330	270	660	580
Alaska	1,040	†	70	90	†	50	290	†	†	70	50
Arizona	11,540	330	770	990	510	530	2,800	410	310	830	600
Arkansas	6,760	160	410	620	260	270	2,180	210	140	410	290
California	58,180	1,690	4,320	5,180	2,550	3,250	12,370	2,070	1,530	4,240	3,180
Colorado	7,590	260	540	650	330	350	1,710	250	240	530	430
Connecticut	6,840	190	460	440	300	270	1,730	220	170	540	360
Delaware	2,010	50	120	150	80	90	600	60	†	140	100
Dist. of Columbia	990	†	80	100	†	60	210	†	†	80	70
Florida	43,050	1,000	2,830	3,520	1,790	1,710	11,920	1,440	940	2,980	2,030
Georgia	16,460	430	1,240	1,500	630	660	4,640	470	430	1,040	750
Hawaii	2,470	†	130	230	100	140	580	90	60	220	110
Idaho	2,790	90	190	220	130	90	670	100	60	210	170
Illinois	23,940	570	1,640	2,090	990	860	6,550	810	560	1,640	1,080
Indiana	13,420	340	870	1,080	570	400	4,060	450	300	850	540
Iowa	6,440	190	390	570	270	210	1,770	250	170	410	300
Kansas	5,510	170	350	480	260	190	1,540	200	140	380	240
Kentucky	10,200	230	590	850	370	310	3,550	320	200	600	350
Louisiana	9,040	210	630	810	330	440	2,610	280	180	620	380
Maine	3,300	90	180	240	140	100	970	110	70	210	150
Maryland	10,470	260	810	860	400	440	2,700	320	250	780	500
Massachusetts	12,710	330	770	930	530	580	3,420	410	330	930	570
Michigan	20,920	580	1,410	1,670	890	730	6,010	740	470	1,480	810
Minnesota	9,820	270	620	760	490	370	2,450	380	240	660	510
Mississippi	6,360	140	410	640	250	260	1,950	170	110	390	300
Missouri	12,830	310	900	1,050	530	480	3,910	400	240	860	500
Montana	2,020	60	130	170	90	60	540	70	60	140	120
Nebraska	3,480	110	210	340	140	120	890	130	70	240	180
Nevada	4,880	150	380	470	190	220	1,410	150	110	370	260
New Hampshire	2,730	80	170	200	110	80	770	80	70	200	120
New Jersey	16,250	380	1,290	1,480	640	630	3,900	510	450	1,240	720
New Mexico	3,620	100	270	350	150	180	760	120	110	250	210
New York	34,600	840	2,420	2,890	1,470	1,520	8,740	1,300	900	2,590	1,640
North Carolina	19,310	460	1,340	1,490	750	730	5,780	590	430	1,200	860
North Dakota	1,280	†	80	130	60	†	320	†	†	90	70
Ohio	25,400	620	1,740	2,090	1,010	850	7,370	850	560	1,720	1,130
Oklahoma	8,100	220	520	680	320	310	2,460	260	180	490	350
Oregon	8,040	240	510	670	330	370	2,070	280	220	560	420
Pennsylvania	28,640	650	1,950	2,400	1,240	1,020	7,520	1,030	700	2,050	1,280
Rhode Island	2,120	50	130	160	90	90	570	60	†	120	100
South Carolina	10,130	240	690	840	350	380	2,970	300	230	640	460
South Dakota	1,630	50	110	140	80	50	450	50	†	100	90
Tennessee	14,370	360	890	1,220	540	550	4,600	450	290	840	580
Texas	38,520	1,010	2,710	3,470	1,620	2,260	9,580	1,260	930	2,550	1,570
Utah	2,900	120	270	240	140	120	460	120	90	240	200
Vermont	1,360	†	80	100	50	60	400	†	†	90	70
Virginia	14,830	370	1,090	1,180	580	570	4,070	480	380	1,040	670
Washington	12,700	400	830	990	540	590	3,220	440	350	900	690
West Virginia	4,710	110	270	410	190	130	1,460	160	100	250	170
Wisconsin	11,550	350	720	850	540	400	3,050	410	300	830	590
Wyoming	1,000	†	70	80	60	†	240	†	†	70	†
United States	**589,430**	**15,320**	**40,290**	**49,700**	**24,450**	**24,550**	**158,040**	**19,790**	**14,180**	**40,560**	**27,540**

*Rounded to the nearest 10.

†Estimate is fewer than 50 deaths.

Note: These are model-based estimates that should be interpreted with caution. State estimates may not add to US total due to rounding and the exclusion of states with fewer than 50 deaths.

TABLE 4. Probability (%) of Developing Invasive Cancer Within Selected Age Intervals by Sex, United States, 2009 to 2011*

		BIRTH TO 49	50 TO 59	60 TO 69	≥70	BIRTH TO DEATH
All sites†	Male	3.4 (1 in 29)	6.7 (1 in 15)	15.1 (1 in 7)	36.0 (1 in 3)	43.3 (1 in 2)
	Female	5.4 (1 in 19)	6.0 (1 in 17)	10.0 (1 in 10)	26.4 (1 in 4)	37.8 (1 in 3)
Breast	Female	1.9 (1 in 53)	2.3 (1 in 44)	3.5 (1 in 29)	6.7 (1 in 15)	12.3 (1 in 8)
Colorectum	Male	0.3 (1 in 300)	0.7 (1 in 148)	1.3 (1 in 80)	3.9 (1 in 26)	4.8 (1 in 21)
	Female	0.3 (1 in 326)	0.5 (1 in 193)	0.9 (1 in 112)	3.5 (1 in 28)	4.5 (1 in 22)
Kidney & renal pelvis	Male	0.2 (1 in 468)	0.3 (1 in 292)	0.6 (1 in 157)	1.3 (1 in 76)	2.0 (1 in 49)
	Female	0.1 (1 in 752)	0.2 (1 in 586)	0.3 (1 in 321)	0.7 (1 in 134)	1.2 (1 in 84)
Leukemia	Male	0.2 (1 in 419)	0.2 (1 in 598)	0.4 (1 in 271)	1.3 (1 in 75)	1.7 (1 in 59)
	Female	0.2 (1 in 516)	0.1 (1 in 968)	0.2 (1 in 464)	0.9 (1 in 117)	1.2 (1 in 84)
Lung & bronchus	Male	0.2 (1 in 578)	0.7 (1 in 140)	2.0 (1 in 49)	6.6 (1 in 15)	7.4 (1 in 13)
	Female	0.2 (1 in 541)	0.6 (1 in 173)	1.6 (1 in 64)	4.9 (1 in 20)	6.2 (1 in 16)
Melanoma of the skin‡	Male	0.3 (1 in 294)	0.4 (1 in 240)	0.8 (1 in 129)	2.1 (1 in 47)	3.0 (1 in 34)
	Female	0.5 (1 in 207)	0.3 (1 in 323)	0.4 (1 in 246)	0.9 (1 in 112)	1.9 (1 in 53)
Non-Hodgkin lymphoma	Male	0.3 (1 in 366)	0.3 (1 in 347)	0.6 (1 in 173)	1.8 (1 in 55)	2.4 (1 in 42)
	Female	0.2 (1 in 543)	0.2 (1 in 483)	0.4 (1 in 233)	1.4 (1 in 72)	1.9 (1 in 52)
Prostate	Male	0.3 (1 in 304)	2.3 (1 in 44)	6.3 (1 in 16)	10.9 (1 in 9)	15.0 (1 in 7)
Thyroid	Male	0.2 (1 in 585)	0.1 (1 in 827)	0.2 (1 in 653)	0.2 (1 in 464)	0.6 (1 in 174)
	Female	0.7 (1 in 135)	0.3 (1 in 288)	0.3 (1 in 306)	0.4 (1 in 263)	1.7 (1 in 60)
Uterine cervix	Female	0.3 (1 in 358)	0.1 (1 in 840)	0.1 (1 in 842)	0.2 (1 in 565)	0.6 (1 in 154)
Uterine corpus	Female	0.3 (1 in 367)	0.6 (1 in 170)	0.9 (1 in 109)	1.3 (1 in 76)	2.7 (1 in 37)

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

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

‡Probabilities are for whites.

probability of developing cancer was calculated using NCI's DevCan software (version 6.7.1).[13] All incidence and death rates were age-standardized to the 2000 US standard population and expressed per 100,000 population, as calculated by NCI's SEER*Stat software (version 8.1.5).[14] The annual percent change in rates was quantified using NCI's Joinpoint Regression Program (version 4.1.1).[15]

Whenever possible, cancer incidence rates presented in this report were adjusted for delays in reporting, which can occur because of a lag in case capture or data corrections. This adjustment is only available for data from the 13 oldest SEER registries because historic patterns of case ascertainment are required to anticipate future corrections to registry data. Delay adjustment has the largest effect on the most recent years of data for cancers that are frequently diagnosed in outpatient settings (eg, melanoma, leukemia, and prostate cancer) and provides a more accurate portrayal of the cancer burden in the most recent time period.[16] For example, leukemia incidence rates adjusted for reporting delays are 13% higher than unadjusted rates in the most recent data year.[4] Delay-adjusted rates were obtained from SEER*Stat databases.[17,18]

Projected Cancer Cases and Deaths in 2015

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, compilation, quality control, and dissemination. Therefore, we project the numbers of new cancer cases and deaths in the United States in the current year in order to provide an estimate of the contemporary cancer burden. These 4-year-ahead projections are not useful for tracking cancer occurrence over time because they are model-based and because the methodology varies over time as we continually strive to achieve the most accurate estimates by taking advantage of improved modeling techniques, increased cancer registration coverage, and updated covariates.

A 3-step spatio-temporal model was used to estimate the number of new invasive cancer cases that will be diagnosed in 2015 based on high-quality incidence data from 49 states (Minnesota data were unavailable) and the District of Columbia during 1995 through 2011. Case coverage represents approximately 89% of the population because, in addition to lacking Minnesota, many states did not achieve high-quality data standards every year. In the first step, complete incidence counts were estimated for each county from 1995 through 2011 using geographic variations in sociodemographic and lifestyle factors, medical settings, and cancer screening behaviors as predictors of incidence.[19] Then these counts were adjusted to account for delays in cancer reporting and aggregated to obtain national- and state-level estimates. Finally, a temporal projection method (the vector autoregressive model) was applied to the last 15 years of data to estimate counts for 2015. This method cannot estimate numbers of basal cell or squamous cell skin cancers because data on the occurrence of these cancers are not required to be reported to cancer registries. For the complete details of the case projection methodology, please refer to Zhu et al.[20]

To estimate the number of cases of female breast carcinoma in situ and melanoma in situ diagnosed in 2015, we first estimated the number of cases occurring annually from 2002 through 2011 by applying age-specific NAACCR incidence rates (data from 44 states with high-quality data every year) to the corresponding US population estimates provided in SEER*Stat.[8,14] SEER 13-based delay-adjustment ratios, accessed from NCI's Cancer Query System,[21] were applied to in situ breast cancer counts to account for delays in reporting. (Delay-adjustment ratios are not available for in situ melanoma.) Then the total number of cases in 2015 was projected based on the average annual percent change in case counts from 2002 through 2011 generated by the joinpoint regression model.[15]

We estimated the number of cancer deaths expected to occur in 2015 in the United States overall and in each state using the joinpoint regression model based on the actual numbers of cancer deaths from 1997 through 2011 at the state and national levels as reported to the NCHS. For the complete details of this methodology, please refer to Chen et al.[22]

Other Statistics

The estimated number of cancer deaths averted in men and women due to the reduction in overall cancer death rates was calculated by first estimating the number of cancer deaths that would have occurred if death rates had remained at their peak. The expected number of deaths was estimated by applying the 5-year age-specific cancer death rates in the peak year for age-standardized cancer death rates (1990 in men and 1991 in women) to the corresponding age-specific populations in subsequent years through 2011. The difference between the number of expected and recorded cancer deaths in each age group and calendar year was then summed. Averted deaths by state in 2011 were calculated similarly using state- and age-specific average annual crude rates for 5 age groups during 1990 through 1992. An aggregate rate was used instead of a single year because peak years varied across states, with a majority of states reaching peak rates during 1990 to 1992.

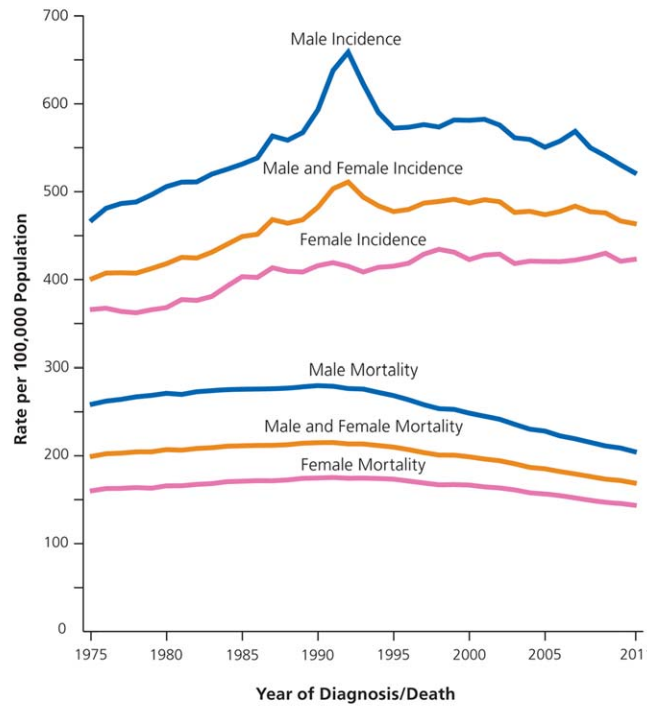


FIGURE 2. Trends in Cancer Incidence and Death Rates by Sex, United States, 1975 to 2011.
Rates are age adjusted to the 2000 US standard population. Incidence rates are adjusted for delays in reporting.

Selected Findings

Expected Numbers of New Cancer Cases

Table 1 presents the estimated numbers of new cases of invasive cancer expected in the United States in 2015 by sex. The overall estimate of 1,658,370 new cases is the equivalent of more than 4,500 new cancer diagnoses each day. In addition, about 60,290 cases of female breast carcinoma in situ and 63,440 cases of melanoma in situ are expected to be diagnosed in 2015. The estimated numbers of new cases by state for selected cancer sites are shown in Table 2.

Figure 1 indicates the most common cancers expected to occur in men and women in 2015. Prostate, lung and bronchus, and colorectal cancers will account for about one-half of all cases in men, with prostate cancer alone accounting for about one-quarter of new diagnoses. The 3 most commonly diagnosed cancers in women will be breast, lung and bronchus, and colorectum, accounting for one-half of all cases in women. Breast cancer alone is expected to account for 29% of all new cancers in women.

Expected Numbers of Cancer Deaths

Table 1 also shows the expected numbers of deaths from cancer in 2015. It is estimated that about 589,430 Americans

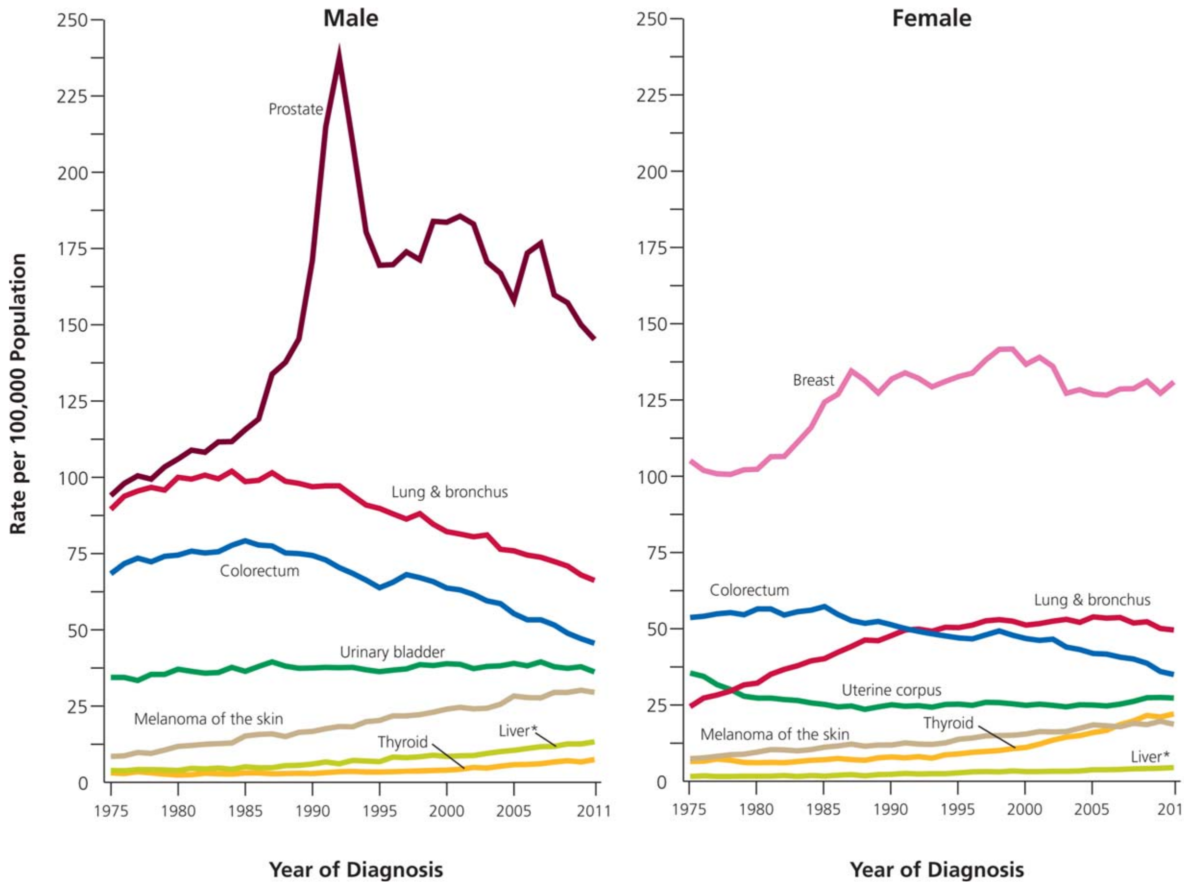


FIGURE 3. Trends in Incidence Rates for Selected Cancers by Sex, United States, 1975 to 2011.
Rates are age adjusted to the 2000 US standard population and adjusted for delays in reporting.
*Includes intrahepatic bile duct.

will die from cancer this year, corresponding to about 1,600 deaths per day. The most common causes of cancer death are cancers of the lung and bronchus, prostate, and colorectum in men and cancers of the lung and bronchus, breast, and colorectum in women. These 4 cancers account for almost one-half of all cancer deaths (Fig. 1), with more than one-quarter (27%) of all cancer deaths due to lung cancer. Table 3 provides the estimated numbers of deaths in 2015 by state for selected cancer sites.

Lifetime Probability of Developing Cancer

The lifetime probability of being diagnosed with an invasive cancer is higher for men (43%) than for women (38%) (Table 4). The reasons for increased susceptibility in men are not well understood, but to some extent likely reflect differences in environmental exposures, endogenous hormones, and complex interactions between these influences. Recent studies suggest that height may also be a factor.[23,24] For adults aged younger than 50 years, however, cancer risk is higher for women (5.4%) than for men (3.4%) because of the higher occurrence of breast, genital, and thyroid cancers in young women. The current cancer incidence rate among individuals aged birth to 49 years is 78.6 (per 100,000 population) in males and 125.1 in females, compared with 1732.8 and 1188.9, respectively, among adults aged 50 years and older.[8] The estimated probability of developing cancer is based on the average experience of the general population and may over- or underestimate individual risk because of differences in exposure (eg, smoking history), medical history, and/or genetic susceptibility.

Trends in Cancer Incidence

Figures 2 and 3 illustrate long-term trends in cancer incidence rates for all cancers combined and for selected cancer sites by sex. Cancer incidence patterns in the United States reflect behavioral trends and improvements in cancer prevention and control, as well as changes in medical practice. Trends in overall incidence are heavily influenced by the 4 major cancers (lung, breast, prostate, and colorectal). For example, the steady increase in incidence rates in men from 1975 to the early 1990s (Fig. 2) was driven by a surge in prostate cancer incidence largely due to the increased detection of asymptomatic disease, first through the use of transurethral prostatectomy and then through widespread prostate-specific antigen (PSA) testing (Fig. 3).[25,26] The

TABLE 5. Trends in Cancer Incidence (Delay-Adjusted) and Death Rates for Selected Cancers by Sex, United States, 1992 to 2011

	TREND 1		TREND 2		TREND 3		TREND 4		2007-2011
	YEARS	APC	YEARS	APC	YEARS	APC	YEARS	APC	AAPC
All sites									
Incidence									
Overall	1992-1994	−3.1	1994-1999	0.3	1999-2011	−0.5*			−0.5*
Male	1992-1994	−5.9*	1994-2007	−0.5*	2007-2011	−1.8*			−1.8*
Female	1992-1998	0.8*	1998-2003	−0.7	2003-2011	0.0			0.0
Death									
Overall	1992-2001	−1.0*	2001-2011	−1.5*					−1.5*
Male	1992-2001	−1.4*	2001-2011	−1.8*					−1.8*
Female	1992-1995	−0.2	1995-1998	−1.2*	1998-2001	−0.4	2001-2011	−1.4*	−1.4*
Female breast									
Incidence	1992-1999	1.3*	1999-2004	−2.2*	2004-2011	0.3			0.3
Death	1992-1995	−1.3*	1995-1998	−3.4*	1998-2011	−1.9*			−1.9*
Colorectum									
Incidence									
Male	1992-1995	−2.6*	1995-1998	1.4	1998-2008	−2.5*	2008-2011	−4.0*	−3.6*
Female	1992-1995	−1.8*	1995-1998	1.8	1998-2008	−1.9*	2008-2011	−4.2*	−3.6*
Death									
Male	1992-2002	−2.0*	2002-2005	−3.9*	2005-2011	−2.6*			−2.6*
Female	1992-2001	−1.7*	2001-2011	−3.0*					−3.0*
Liver & intrahepatic bile duct									
Incidence									
Male	1992-2011	3.6*							3.6*
Female	1992-2011	2.9*							2.9*
Death									
Male	1992-2007	2.2*	2007-2011	3.3*					3.3*
Female	1992-2008	1.3*	2008-2011	3.1*					2.6*
Lung & bronchus									
Incidence									
Male	1992-2009	−1.9*	2009-2011	−4.0*					−3.0*
Female	1992-2007	0.0	2007-2011	−2.2*					−2.2*
Death									
Male	1992-2005	−1.9*	2005-2011	−2.9*					−2.9*
Female	1992-1995	1.4*	1995-2003	0.3*	2003-2007	−0.8	2007-2011	−1.9*	−1.9*
Melanoma of skin									
Incidence									
Male	1992-2011	2.3*							2.3*
Female	1992-1997	4.1*	1997-2011	1.5*					1.5*
Death									
Male	1992-2011	0.3*							0.3*
Female	1992-2011	−0.5*							−0.5*
Pancreas									
Incidence									
Male	1992-2001	0.0	2001-2011	1.2*					1.2*
Female	1992-1999	−0.1	1999-2011	1.1*					1.1*
Death									
Male	1992-1996	−1.0*	1996-2011	0.3*					0.3*
Female	1992-1997	−0.4	1997-2011	0.4*					0.4*
Prostate									
Incidence	1992-1995	−11.2*	1995-2000	2.3	2000-2011	−2.1*			−2.1*
Death	1992-1994	−1.0	1994-2004	−3.8*	2004-2011	−3.2*			−3.2*
Thyroid									
Incidence									
Male	1992-1995	−3.1	1995-2011	5.3*					5.3*
Female	1992-1999	4.2*	1999-2009	6.9*	2009-2011	2.2			4.5*
Death									
Male	1992-2011	1.6*							1.6*
Female	1992-1994	−6.0	1994-2011	0.8*					0.8*

APC indicates annual percent change based on incidence (delay-adjusted) and mortality rates age adjusted to the 2000 US standard population; AAPC, average annual percent change.

*The APC or AAPC is significantly different from zero ($P < .05$).

Note: Trends analyzed by the Joinpoint Regression Program, version 4.1.1, allowing up to 3 joinpoints. Incidence trends based on Surveillance, Epidemiology, and End Results (SEER) 13 areas.

TABLE 6. Trends in 5-Year Relative Survival Rates* (%) by Race and Year of Diagnosis, United States, 1975 to 2010

	ALL RACES			WHITE			BLACK		
	1975 TO 1977	1987 TO 1989	2004 TO 2010	1975 TO 1977	1987 TO 1989	2004 TO 2010	1975 TO 1977	1987 TO 1989	2004 TO 2010
All sites	49	55	68†	50	57	69†	39	43	62†
Brain & other nervous system	22	29	35†	22	28	33†	25	32	42†
Breast (female)	75	84	91†	76	85	92†	62	71	80†
Colon	51	60	65†	51	61	67†	45	52	56†
Esophagus	5	9	20†	6	11	21†	4	7	13†
Hodgkin lymphoma	72	79	88†	72	80	88†	70	72	85†
Kidney & renal pelvis	50	57	74†	50	57	74†	49	55	72†
Larynx	66	66	63†	67	67	64	58	56	52
Leukemia	34	43	60†	35	44	61†	33	35	54†
Liver & intrahepatic bile duct	3	5	18†	3	6	17†	2	3	13†
Lung & bronchus	12	13	18†	12	13	18†	11	11	15†
Melanoma of the skin	82	88	93†	82	88	93†	57‡	79‡	75
Myeloma	25	27	47†	24	27	47†	30	30	47†
Non-Hodgkin lymphoma	47	51	71†	47	51	73†	48	46	63†
Oral cavity & pharynx	53	54	66†	54	56	67†	36	34	45†
Ovary	36	38	45†	35	38	44†	42	34	36
Pancreas	3	4	7†	3	3	7†	2	6	7†
Prostate	68	83	>99†	69	84	>99†	61	71	98†
Rectum	48	58	68†	48	59	68†	44	52	63†
Stomach	15	20	29†	14	18	28†	16	19	28†
Testis	83	95	97†	83	96	97†	73‡§	88‡	90
Thyroid	92	94	98†	92	94	98†	90	92	96†
Urinary bladder	72	79	79†	73	80	80†	50	63	64†
Uterine cervix	69	70	70	70	73	71	65	57	62
Uterine corpus	87	82	83†	88	84	85†	60	57	65†

*Survival rates are adjusted for normal life expectancy and are based on cases diagnosed in the Surveillance, Epidemiology, and End Results (SEER) 9 areas from 1975 to 1977, 1987 to 1989, and 2004 to 2010, all followed through 2011.

†The difference in rates between 1975 to 1977 and 2004 to 2010 is statistically significant ($P < .05$).

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

§Survival rate is for 1978 to 1980.

increase in incidence in women during the 1980s reflects the increase in lung cancer as a result of the tobacco epidemic and the increase in breast cancer because of changes in female reproductive patterns, as well as increased detection of asymptomatic disease during the rapid uptake of mammography screening.[27]

Table 5 presents the annual percent change in delay-adjusted incidence rates in the SEER 13 registries during 1992 through 2011 based on joinpoint regression analysis. Joinpoint is a tool used to describe and quantify trends by fitting observed rates to lines connected at "joinpoints" where trends change in direction or magnitude.[7,28] During the past 5 years for which there are data (2007-2011), the overall incidence rate remained stable in women and declined by 1.8% per year in men. The decrease in men is driven by the rapid declines in colorectal (3.6% per year), lung (3.0% per year), and prostate (2.1% per year) cancers. Among women, although the recent rates of decline for colorectal and lung cancers have been similar to those in men, breast cancer incidence rates remained flat and thyroid cancer incidence rates increased dramatically, by an average of 4.5% per year from 2007 to 2011. Although thyroid cancer incidence is also increasing rapidly in men, the 3-fold higher rates in women have a larger influence on overall trends.[8]

The long-term declines in colorectal cancer incidence rates since the mid-1980s have been attributed to both changes in risk factors and the introduction of colorectal cancer screening.[29] However, the rapid declines in recent years (4.0% or greater per year from 2008-2011) likely reflect the increased uptake of screening, primarily in the form of colonoscopy, which can prevent cancer by allowing for the removal of precancerous lesions.[30,31] Among adults aged 50 to 75 years, colonoscopy use increased from 19.1% in 2000 to 54.5% in 2013.[32]

Lung cancer incidence rates began declining in the mid-1980s in men and in the late 1990s in women as a result of reductions in smoking prevalence that began decades earlier. Contemporary differences in lung cancer incidence patterns between men and women (Fig. 3) reflect historical differences in tobacco use. Women took up smoking in large numbers decades later than men, first

TABLE 7. Relative Decline in Cancer Death Rates by State Since the Early 1990s and Potential Deaths Averted in 2011

	1990 TO 1992 RATE	2011 RATE	RELATIVE DECLINE	2011 OBSERVED COUNTS*	2011 EXPECTED COUNTS†	2011 AVERTED DEATHS‡
Alabama	220.2	187.4	15%	10,233	12,122	1,889
Alaska	219.3	176.1	20%	935	1,204	269
Arizona	197.8	148.4	25%	10,690	14,363	3,673
Arkansas	221.8	191.1	14%	6,497	7,625	1,128
California	202.2	151.8	25%	56,448	76,129	19,681
Colorado	187.5	143.9	23%	7,051	9,416	2,365
Connecticut	206.9	157.9	24%	6,837	8,948	2,111
Delaware	240.9	179.7	25%	1,905	2,583	678
Dist. of Columbia	269.7	180.6	33%	1,070	1,629	559
Florida	208.0	160.2	23%	41,681	53,723	12,042
Georgia	214.8	171.0	20%	15,602	20,184	4,582
Hawaii	172.5	138.2	20%	2,278	2,841	563
Idaho	187.0	157.6	16%	2,573	3,111	538
Illinois	222.9	174.8	22%	24,006	31,036	7,030
Indiana	221.0	185.2	16%	13,180	15,966	2,786
Iowa	198.5	172.4	13%	6,481	7,502	1,021
Kansas	197.2	169.9	14%	5,440	6,343	903
Kentucky	236.3	200.9	15%	9,733	11,726	1,993
Louisiana	240.4	193.5	20%	9,233	11,646	2,413
Maine	230.5	181.7	21%	3,201	4,087	886
Maryland	237.3	165.9	30%	10,249	14,865	4,616
Massachusetts	225.1	166.4	26%	12,895	17,531	4,636
Michigan	220.2	177.4	19%	20,420	25,597	5,177
Minnesota	197.8	160.5	19%	9,489	11,849	2,360
Mississippi	224.2	196.8	12%	6,278	7,233	955
Missouri	217.5	179.4	18%	12,473	15,311	2,838
Montana	203.4	164.4	19%	2,022	2,547	525
Nebraska	192.9	164.2	15%	3,410	4,052	642
Nevada	226.7	170.3	25%	4,605	6,308	1,703
New Hampshire	224.0	178.0	21%	2,740	3,510	770
New Jersey	229.6	165.6	28%	16,708	23,332	6,624
New Mexico	182.5	146.6	20%	3,328	4,200	872
New York	215.4	159.6	26%	35,469	47,934	12,465
North Carolina	213.9	174.8	18%	18,284	22,694	4,410
North Dakota	199.1	160.5	19%	1,321	1,644	323
Ohio	224.2	184.4	18%	25,140	30,880	5,740
Oklahoma	209.6	191.2	9%	7,997	8,859	862
Oregon	209.2	172.2	18%	7,802	9,668	1,866
Pennsylvania	223.6	177.3	21%	28,895	36,398	7,503
Rhode Island	222.7	168.3	24%	2,170	2,888	718
South Carolina	219.7	182.2	17%	9,543	11,662	2,119
South Dakota	195.9	168.6	14%	1,665	1,930	265
Tennessee	220.6	189.1	14%	13,562	16,015	2,453
Texas	211.3	162.6	23%	37,351	49,696	12,345
Utah	157.4	125.6	20%	2,746	3,469	723
Vermont	218.9	175.6	20%	1,347	1,735	388
Virginia	222.1	170.7	23%	14,374	19,125	4,751
Washington	205.9	166.6	19%	12,002	15,194	3,192
West Virginia	226.8	199.6	12%	4,782	5,569	787
Wisconsin	208.1	174.9	16%	11,608	13,950	2,342
Wyoming	193.2	156.1	19%	936	1,192	256

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

*Excludes unknown age.

†Expected counts were estimated by applying age-specific crude rates for 1990–1992 to 2011 population estimates.

‡Deaths averted is the difference between the number of expected and observed deaths in 2011.

initiated smoking at older ages, and were slower to quit, including recent upturns in smoking prevalence in some birth cohorts.[33,34]

The decline in prostate cancer incidence rates that began in the mid-1990s likely reflects the diminishing proportion of men receiving an initial PSA test.[35]

TABLE 8. Ten Leading Causes of Death by Age and Sex, United States, 2011

	ALL AGES		AGES 1 TO 19		AGES 20 TO 39		AGES 40 TO 59		AGES 60 TO 79		AGES ≥80	
	MALE All Causes 1,254,978	**FEMALE All Causes 1,260,480**	**MALE All Causes 13,202**	**FEMALE All Causes 7,039**	**MALE All Causes 61,744**	**FEMALE All Causes 28,555**	**MALE All Causes 226,700**	**FEMALE All Causes 143,234**	**MALE All Causes 484,159**	**FEMALE All Causes 382,212**	**MALE All Causes 455,747**	**FEMALE All Causes 688,747**
1	Heart diseases 308,398	Heart diseases 288,179	Accidents (unintentional injuries) 4,916	Accidents (unintentional injuries) 2,394	Accidents (unintentional injuries) 22,459	Accidents (unintentional injuries) 8,122	Cancer 54,172	Cancer 50,445	Cancer 158,118	Cancer 129,632	Heart diseases 132,189	Heart diseases 191,463
2	Cancer 302,231	Cancer 274,460	Assault (homicide) 1,862	Cancer 797	Intentional self-harm (suicide) 9,708	Cancer 4,407	Heart diseases 52,247	Heart diseases 21,470	Heart diseases 118,232	Heart diseases 72,365	Cancer 84,860	Cancer 89,145
3	Accidents (unintentional injuries) 79,257	Cerebro-vascular disease 76,597	Intentional self-harm (suicide) 1,633	Assault (homicide) 513	Assault (homicide) 7,051	Heart diseases 2,446	Accidents (unintentional injuries) 25,372	Accidents (unintentional injuries) 12,132	Chronic lower respiratory diseases 32,493	Chronic lower respiratory diseases 31,990	Chronic lower respiratory diseases 29,122	Alzheimer disease 51,567
4	Chronic lower respiratory diseases 67,521	Chronic lower respiratory diseases 75,422	Cancer 1,055	Congenital anomalies 464	Heart diseases 5,143	Intentional self-harm (suicide) 2,409	Intentional self-harm (suicide) 12,287	Chronic lower respiratory diseases 5,428	Cerebro-vascular disease 19,925	Cerebro-vascular disease 19,350	Cerebro-vascular disease 25,029	Cerebro-vascular disease 51,528
5	Cerebro-vascular disease 52,335	Alzheimer disease 59,297	Congenital anomalies 594	Intentional self-harm (suicide) 456	Cancer 3,984	Assault (homicide) 1,359	Chronic liver disease & cirrhosis 11,123	Chronic liver disease & cirrhosis 5,298	Diabetes mellitus 18,200	Diabetes mellitus 14,392	Alzheimer disease 20,171	Chronic lower respiratory diseases 37,645
6	Diabetes mellitus 38,324	Accidents (unintentional injuries) 47,181	Heart diseases 403	Heart diseases 283	HIV disease 879	Pregnancy, childbirth & puerperium 684	Diabetes mellitus 7,795	Cerebro-vascular disease 4,994	Accidents (unintentional injuries) 14,138	Accidents (unintentional injuries) 8,345	Influenza & pneumonia 14,189	Influenza & pneumonia 19,413
7	Intentional self-harm (suicide) 31,003	Diabetes mellitus 35,507	Chronic lower respiratory diseases 172	Influenza & pneumonia 138	Diabetes mellitus 842	Diabetes mellitus 593	Cerebro-vascular disease 6,557	Diabetes mellitus 4,867	Nephritis, nephrotic syndrome & nephrosis 8,596	Nephritis, nephrotic syndrome & nephrosis 7,589	Accidents (unintentional injuries) 11,706	Accidents (unintentional injuries) 15,671
8	Alzheimer disease 25,677	Influenza & pneumonia 28,425	Influenza & pneumonia 158	Chronic lower respiratory diseases 86	Chronic liver disease & cirrhosis 821	Cerebro-vascular disease 581	Chronic lower respiratory diseases 5,393	Intentional self-harm (suicide) 3,981	Chronic liver disease & cirrhosis 8,264	Alzheimer disease 7,530	Diabetes mellitus 11,443	Diabetes mellitus 15,616
9	Influenza & pneumonia 25,401	Nephritis, nephrotic syndrome & nephrosis 22,942	Cerebro-vascular disease 114	Septicemia 86	Cerebro-vascular disease 634	HIV disease 522	HIV disease 3,567	Septicemia 2,409	Influenza & pneumonia 7,741	Septicemia 6,897	Nephritis, nephrotic syndrome & nephrosis 11,184	Nephritis, nephrotic syndrome & nephrosis 13,284
10	Nephritis, nephritic syndrome & nephrosis 22,649	Septicemia 19,264	Septicemia 86	Cerebro-vascular disease 84	Influenza & pneumonia 556	Chronic liver disease & cirrhosis 471	Viral hepatitis 3,347	Influenza & pneumonia 1,947	Septicemia 7,001	Influenza & pneumonia 6,408	Parkinson disease 8,744	Hypertension & hypertensive renal disease* 11,615

HIV indicates human immunodeficiency virus.

*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 Final Mortality Data, 2011, National Center for Health Statistics, Centers for Disease Control and Prevention, 2014.

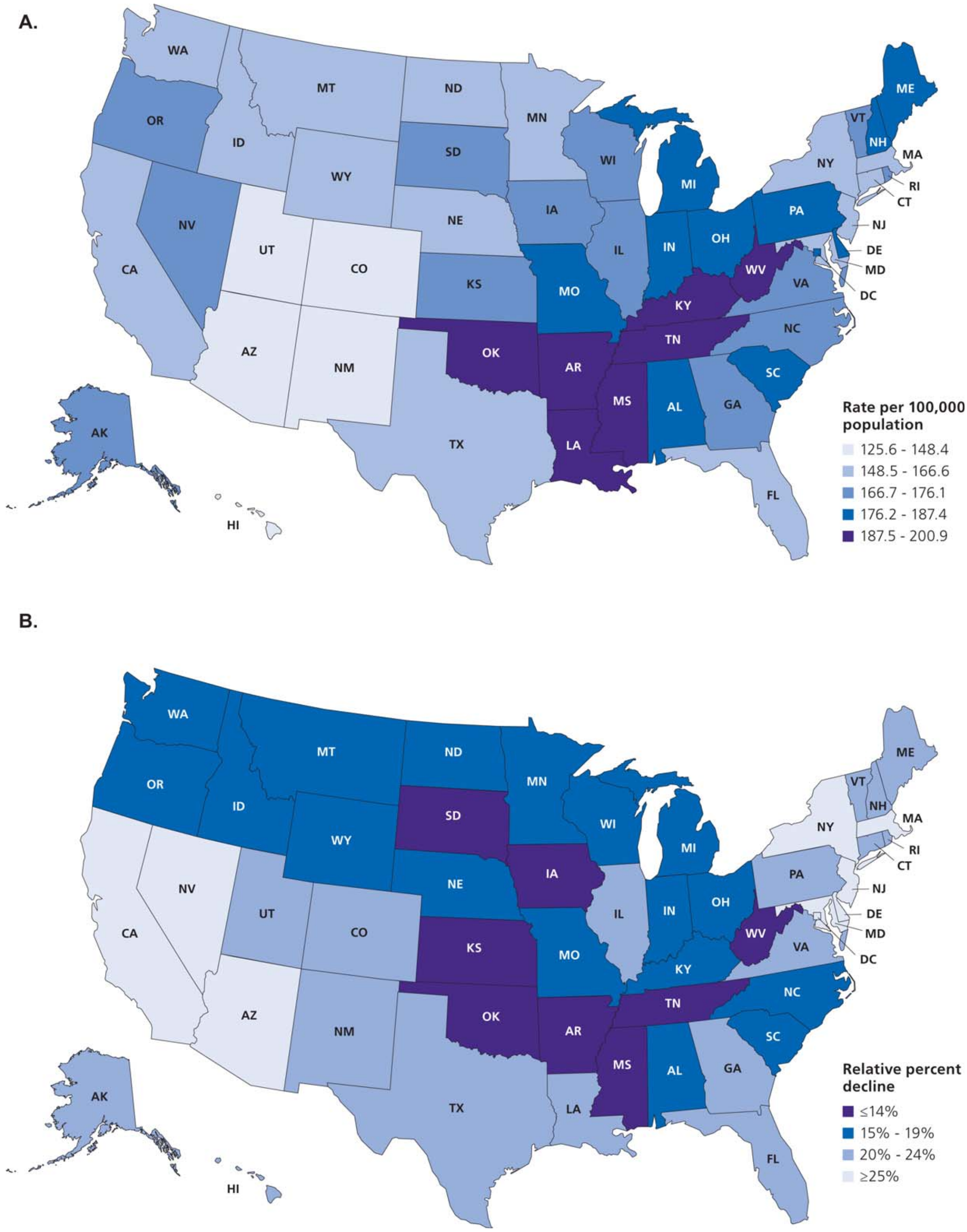


FIGURE 4. Geographic Patterns in Cancer Death Rates in 2011 (A) and in the Relative Decline (%) in Cancer Death Rates from 1990–1992 to 2011 (B).
Rates are per 100,000 and age adjusted to the 2000 US standard population.

Routine screening with the PSA test is no longer recommended because of growing concerns about high rates of overdiagnosis, estimated at 23% to 42% for screen-detected cancers.[36] PSA testing rates may have declined in recent years among men aged younger than 50 years, as well as in those aged 75 years or older, but remain high for older men with a limited life expectancy.[37–39]

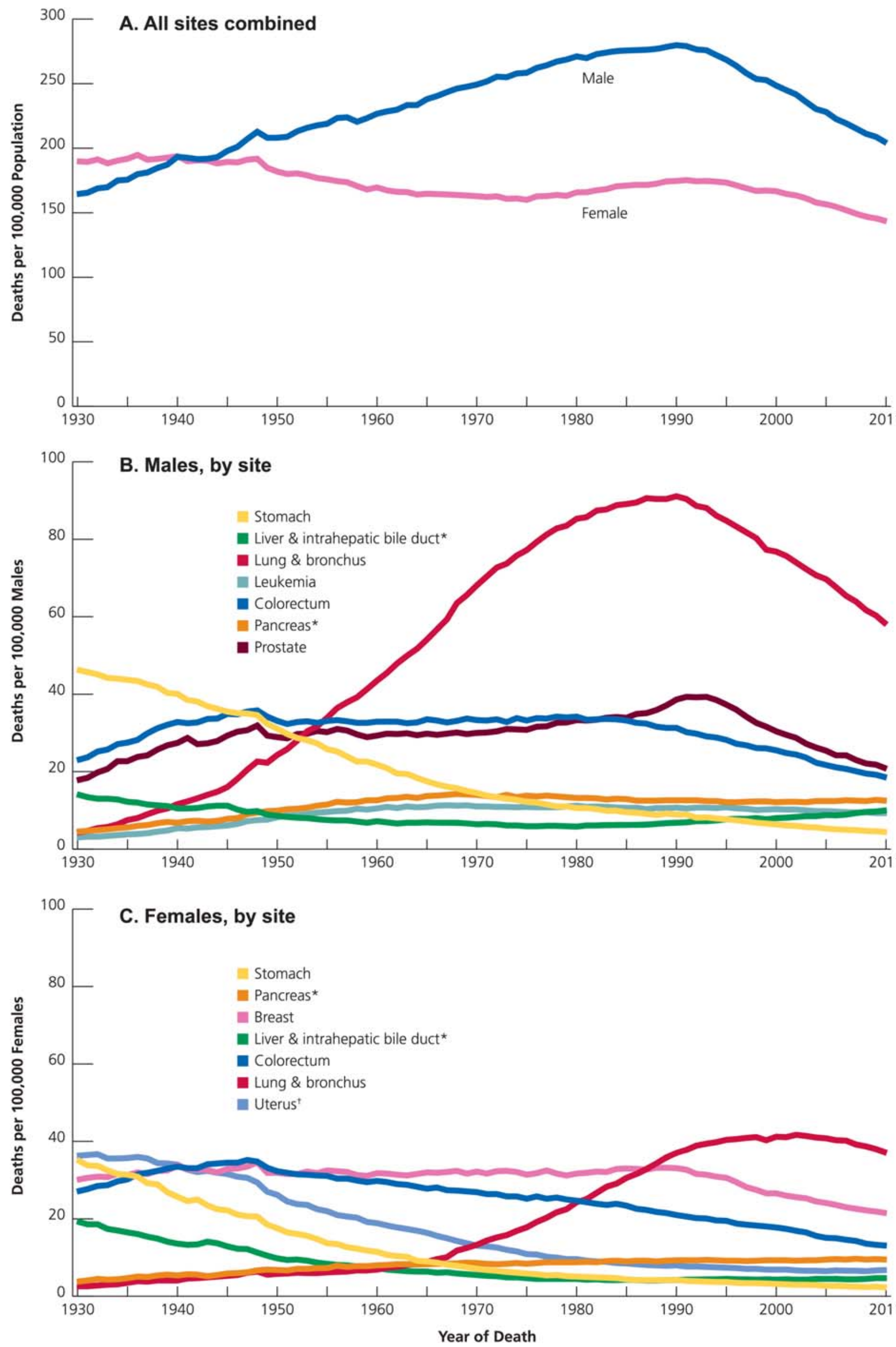


FIGURE 5. Trends in Death Rates Overall and for Selected Sites by Sex, United States, 1930 to 2011.
Rates are age adjusted to the 2000 US standard population. Due to changes in International Classification of Diseases (ICD) coding, numerator information has changed over time. Rates for cancers of the lung and bronchus, colorectum, liver, uterus, and ovary are affected by these changes.
*Mortality rates for pancreatic and liver cancers are increasing.
†Uterus includes uterine cervix and uterine corpus.

In contrast to the stable or declining trends for most cancers, incidence rates in the SEER 13 registries increased from 2007 through 2011 among both men and women for cancers of the small intestine, anus, liver, pancreas, soft tissue (including the heart), and thyroid; melanoma of the skin; myeloma; and leukemia.[7,17] In addition, incidence rates increased in men for breast cancer, non-Hodgkin lymphoma, and human papillomavirus-positive oropharyngeal cancers and in women for esophageal adenocarcinoma and uterine cancer. The largest annual increases were for cancers of the thyroid (5.3% and 4.5% in men and women, respectively) and liver (3.6% and 2.9% in men and women, respectively) (Table 5).

TABLE 9. Five Leading Types of Cancer Death by Age and Sex, United States, 2011

ALL AGES	<20	20 TO 39	40 TO 59	60 TO 79	≥80
MALE					
ALL SITES 302,231	**ALL SITES 1,094**	**ALL SITES 3,984**	**ALL SITES 54,172**	**ALL SITES 158,118**	**ALL SITES 84,860**
Lung & bronchus 86,738	Brain & ONS 308	Leukemia 529	Lung & bronchus 14,347	Lung & bronchus 51,951	Lung & bronchus 20,216
Prostate 27,970	Leukemia 293	Brain & ONS 491	Colorectum 5,789	Colorectum 13,088	Prostate 14,956
Colorectum 26,804	Bones & joints 107	Colorectum 442	Liver* 4,754	Prostate 11,732	Colorectum 7,480
Pancreas 18,881	Soft tissue (including heart) 80	NHL 278	Pancreas 3,676	Pancreas 10,594	Urinary bladder 4,785
Liver* 14,626	NHL 44	Soft tissue (including heart) 225	Esophagus 2,691	Liver* 7,467	Pancreas 4,510
FEMALE					
ALL SITES 274,460	**ALL SITES 828**	**ALL SITES 4,407**	**ALL SITES 50,445**	**ALL SITES 129,632**	**ALL SITES 89,145**
Lung & bronchus 70,219	Brain & ONS 242	Breast 1,041	Breast 11,340	Lung & bronchus 39,287	Lung & bronchus 19,694
Breast 40,931	Leukemia 226	Uterine cervix 417	Lung & bronchus 11,043	Breast 17,538	Breast 11,010
Colorectum 24,979	Soft tissue (including heart) 68	Leukemia 356	Colorectum 4,209	Colorectum 10,084	Colorectum 10,338
Pancreas 18,463	Bones & joints 67	Colorectum 344	Ovary 3,064	Pancreas 9,076	Pancreas 6,747
Ovary 14,346	Kidney & renal pelvis 23	Brain & ONS 303	Pancreas 2,578	Ovary 7,192	Leukemia 4,111

NHL indicates Non-Hodgkin lymphoma; ONS, other nervous system.

*Liver includes intrahepatic bile duct.

Note: Ranking order excludes category titles that begin with "Other."

Trends in Cancer Survival

There have been notable improvements in survival over the past 3 decades for most cancer types in both blacks and whites (Table 6). The 5-year relative survival rate for all sites combined has increased 19 percentage points among whites and 23 percentage points among blacks. Progress has been most rapid for hematopoietic and lymphoid malignancies due to improvements in treatment protocols, including the discovery of targeted therapies. For example, the 5-year survival for acute lymphocytic leukemia increased from 41% during the mid-1970s to 70% during 2004 to 2010. The use of BCR-ABL tyrosine kinase inhibitors (eg, imatinib) doubled survival for patients with chronic myeloid leukemia in less than 2 decades, from 31% in the early 1990s to 60% in 2004 through 2010.[40]

In contrast to the steady increase in survival for most cancers, advances have been slow for lung and pancreatic cancers, for which the 5-year relative survival is currently 18% and 7%, respectively. These low rates are partly because more than one-half of cases are diagnosed at a distant stage, for which 5-year survival is 4% and 2%, respectively. There is promise for improving lung cancer survival rates because of earlier detection through screening with spiral computed tomography, which has been shown to reduce lung cancer deaths by 16% to 20% among adults with at least a 30-pack-year smoking history.[41,42] However, it is important to realize that screening, as well as other changes in detection practices, introduces lead time bias in survival rates, thereby reducing their usefulness in measuring progress against cancer.[43] Advances against cancer are best measured using age-standardized mortality rates.

Trends in Cancer Mortality

The overall cancer death rate rose during most of the 20th century, peaking in 1991. This increase was largely driven by rapid increases in lung cancer deaths among men as a consequence of the tobacco epidemic. Over the past 2 decades, however, there has been a steady decline in the cancer death

TABLE 10. Incidence and Death Rates by Site, Race, and Ethnicity, United States, 2007 to 2011

	NON-HISPANIC WHITE	NON-HISPANIC BLACK	ASIAN/PACIFIC ISLANDER	AMERICAN INDIAN/ ALASKA NATIVE*	HISPANIC
			Incidence		
All sites					
Male	540.8	606.2	322.3	432.2	420.9
Female	435.8	406.3	283.7	368.3	330.1
Breast (female)	127.6	123.0	86.0	91.7	91.6
Colorectum					
Male	49.2	61.9	39.9	50.9	45.9
Female	37.4	45.6	30.0	41.1	31.6
Kidney & renal pelvis					
Male	21.6	24.1	10.7	30.1	20.6
Female	11.3	12.9	5.0	17.8	11.6
Liver & intrahepatic bile duct					
Male	8.9	16.0	21.2	18.4	19.1
Female	3.0	4.6	8.0	8.6	6.9
Lung & bronchus					
Male	81.3	95.4	48.0	68.5	45.0
Female	59.3	51.7	28.0	52.5	26.3
Prostate	133.2	219.8	72.5	97.9	120.2
Stomach					
Male	7.8	15.4	15.3	12.0	13.8
Female	3.5	8.1	8.6	6.5	7.9
Uterine cervix	7.1	10.2	6.4	9.5	10.5
			Mortality		
All sites					
Male	214.0	275.5	131.0	190.0	150.1
Female	151.2	173.0	91.5	135.2	99.9
Breast (female)	22.2	31.4	11.3	15.2	14.5
Colorectum					
Male	18.7	28.4	13.1	19.2	15.8
Female	13.2	18.9	9.5	15.6	9.9
Kidney & renal pelvis					
Male	5.9	5.8	3.0	9.5	5.1
Female	2.6	2.7	1.3	4.4	2.3
Liver & intrahepatic bile duct					
Male	7.3	12.4	14.5	13.8	12.6
Female	3.0	4.3	6.0	6.0	5.5
Lung & bronchus					
Male	63.9	77.5	34.7	50.0	30.5
Female	42.1	37.4	18.4	32.4	14.0
Prostate	20.7	49.8	10.0	21.2	18.5
Stomach					
Male	3.8	9.8	8.3	7.0	7.5
Female	1.9	4.6	4.8	3.8	4.2
Uterine cervix	2.0	4.2	1.8	3.4	2.8

Rates are per 100,000 population and age adjusted to the 2000 US standard population. Nonwhite and nonblack race categories are not mutually exclusive of Hispanic origin.

*Data based on Indian Health Service Contract Health Service Delivery Areas (CHSDA) counties. Incidence rates exclude data from Kansas.

rate as a result of fewer Americans smoking and advances in cancer prevention, early detection, and treatment. The 22% drop in cancer death rates from 1991 (215.1 per 100,000 population) to 2011 (168.7 per 100,000 population) translates into the avoidance of an estimated 1,519,300 cancer deaths (1,071,600 in men and 447,700 in women) that would have occurred if peak rates had persisted.

Although cancer death rates have declined in every state, there is much variation in the magnitude of the declines. Table 7 shows the relative decline in cancer death rates by state from the early 1990s to 2011 and the estimated number of cancer deaths averted in 2011 as a result. The decline was calculated from an average annual baseline rate during 1990 to 1992 because the death rate did not peak in 1991 in all states. Declines ranged from 9% in Oklahoma to 33% in the District of Columbia, and were generally largest in northeastern states. The declines of 25% to 30% in Maryland,

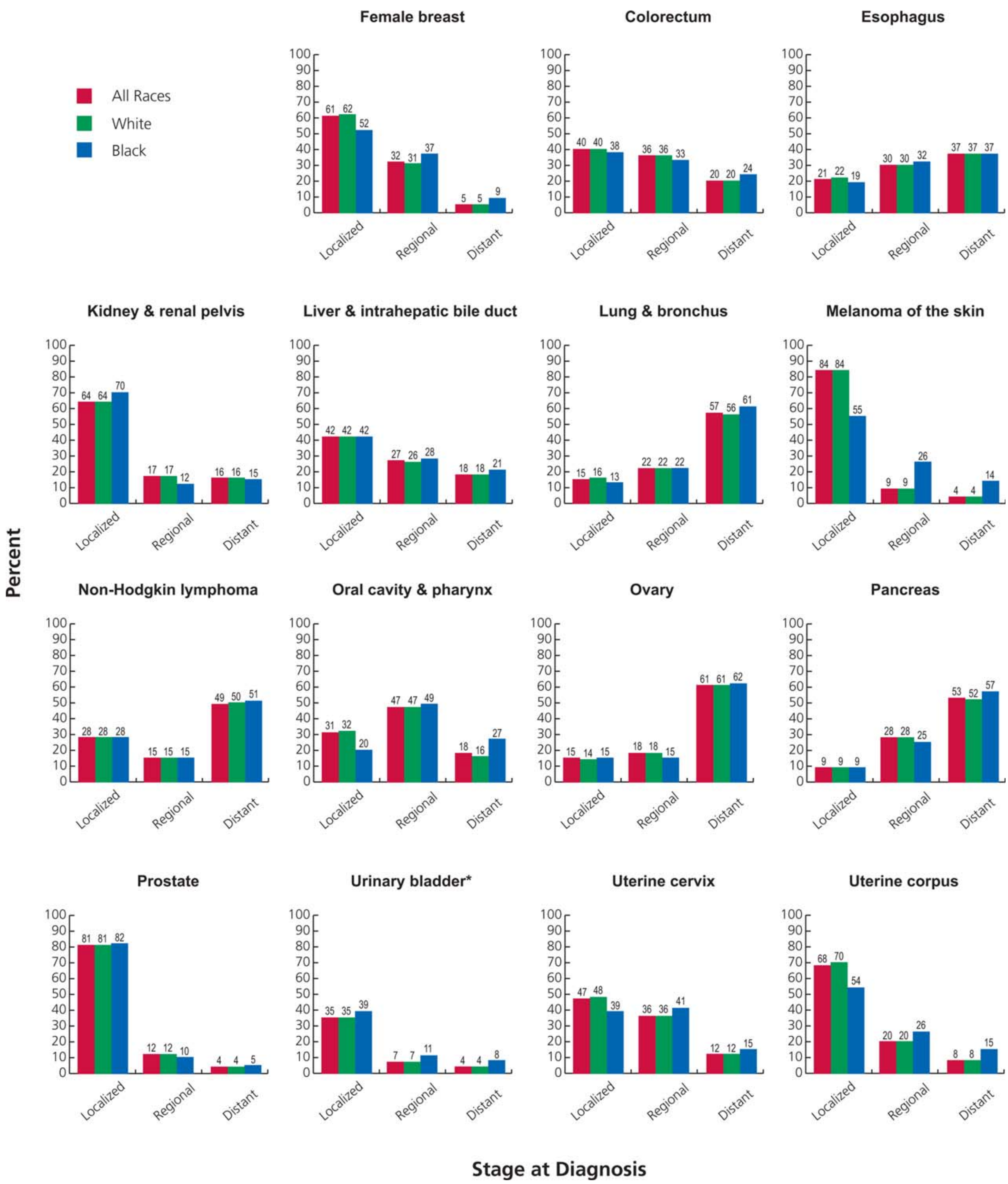


FIGURE 6. Stage Distribution of Selected Cancers by Race, United States, 2004 to 2010.
Stage categories do not sum to 100% because sufficient information is not available to stage all cases.
*The proportion of cases of carcinoma in situ of the urinary bladder is 51% in all races combined, 52% in whites, and 39% in blacks.

New Jersey, Massachusetts, New York, and Delaware resulted in 29,000 fewer cancer deaths, collectively, in 2011. Almost 20,000 deaths were averted in California because of a 25% drop. In general, Southern states had the slowest declines and the highest current death rates, whereas western states had the lowest death rates (Fig. 4). For example, 2011 cancer death rates ranged from 125.6 (per 100,000 population) in Utah to 200.9 in Kentucky. The large geographic variation in cancer death rates and trends reflects differences in risk factor patterns, such as smoking and obesity, as well as disparities in the national distribution of poverty and access to health care, which have increased over time.[44,45]

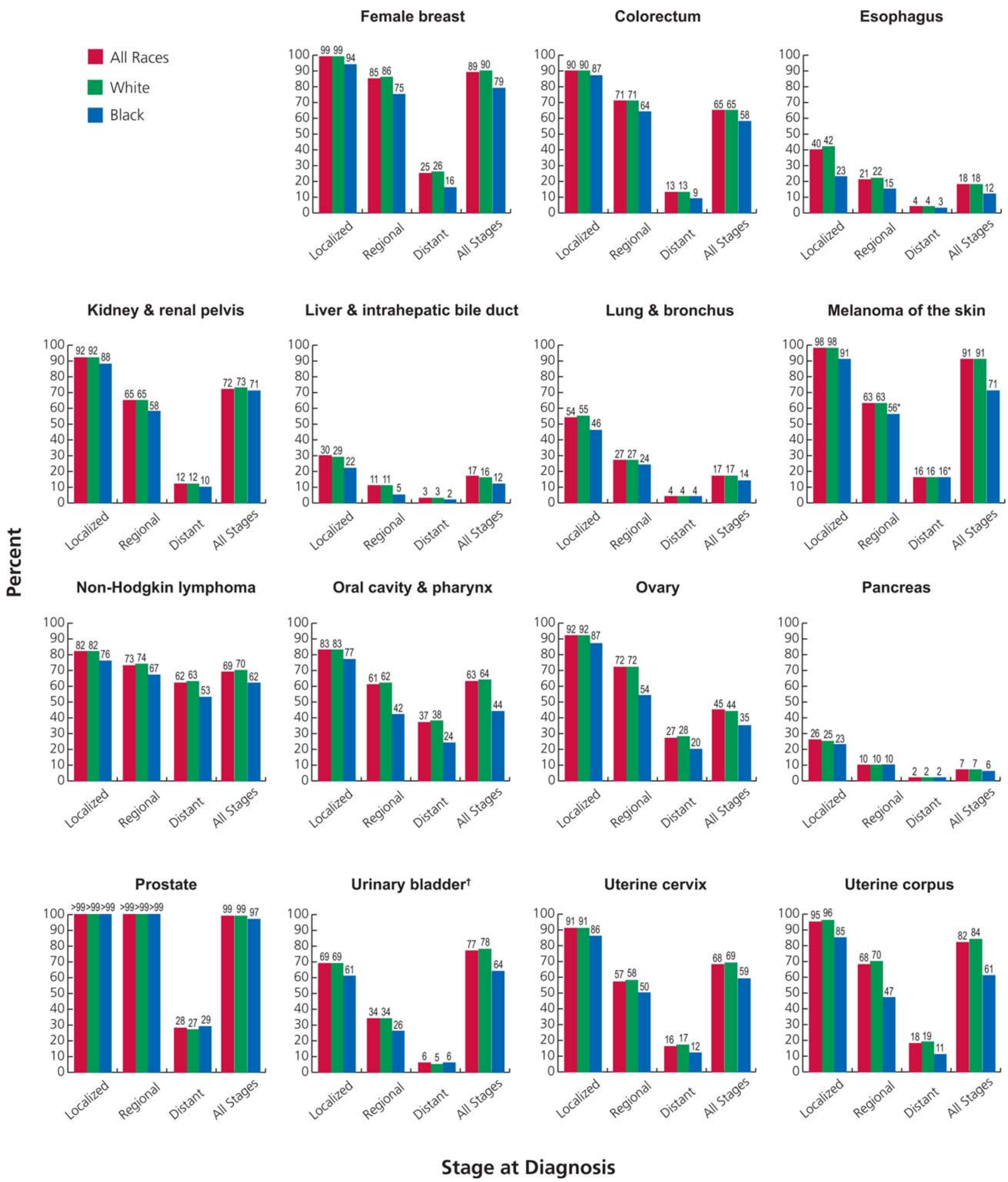


FIGURE 7. Five-Year Relative Survival Rates for Selected Cancers by Race and Stage at Diagnosis, United States, 2004 to 2010.
*The standard error of the survival rate is between 5 and 10 percentage points.
†The survival rate for carcinoma in situ of the urinary bladder is 96% in all races combined, 96% in whites, and 90% in blacks.

Figure 5 depicts trends in cancer death rates since 1930 among men and women overall and for selected cancer sites by sex. In contrast to male cancer death rates, which rose continuously prior to 1990, female cancer death rates fell from the late 1940s to the mid-1970s (Fig. 5A). It is also interesting to note that prior to 1941, death rates were higher in women than in men due to the high death rate for uterine cancer (uterine corpus and uterine cervix combined), which was the leading cause of cancer death among women in the early 20th century. Uterine cancer death rates declined by more than 80% between 1930 and 2011, largely due to the widespread uptake of screening

TABLE 11. Average Annual Percent Change in Cancer Incidence and Mortality Rates From 2007 to 2011 by Race/Ethnicity, United States

	5-YEAR AAPC			
	INCIDENCE		MORTALITY	
	MALE	FEMALE	MALE	FEMALE
Non-Hispanic white	−2.9*	−0.8	−1.6*	−1.3*
Non-Hispanic black	−3.0*	−0.4*	−2.5*	−1.1*
Asian/Pacific Islander	−1.6*	0.1	−1.3*	−0.8*
American Indian/Alaska Native†	−4.3*	−2.3	−0.5	−1.6*
Hispanic	−3.2*	−0.6*	−1.6*	−1.2*

*Average annual percent change is statistically significant ($P < .05$).

†Data based on Indian Health Service Contract Health Service Delivery Areas (CHSDA). Incidence rates exclude data from Kansas.

Notes: Trends analyzed from 2002 to 2011 using the Joinpoint Regression Program, version 4.1.1, allowing up to 2 joinpoints. Incidence trends based on 44 states, representing 92% of the US population.

for the prevention and early detection of cervical cancer. A similarly dramatic decline occurred for stomach cancer, which accounted for 30% and 20% of male and female cancer deaths, respectively, in the 1930s, but just 2% for each in 2011. Although reasons for the decline in the United States and most other parts of the world are complex and not completely understood, contributors are thought to include a lower prevalence of *Helicobacter pylori* because of improved hygiene and lower salt intake and a higher consumption of fresh fruits and vegetables because of advances in food preservation techniques (eg, refrigeration).[46] Recent studies indicate that incidence rates for certain subtypes of stomach cancer are increasing for some subsets of the US population.[47,48]

During the most recent 5 years for which data are available, the average annual decline in cancer death rates was slightly larger among men (1.8%) than women (1.4%) (Table 5). These declines are driven by continued decreases in death rates for the 4 major cancer sites (lung, breast, prostate, and colorectum). Lung cancer death rates declined 36% between 1990 and 2011 among males and 11% between 2002 and 2011 among females due to reduced tobacco use as a result of increased awareness of the health hazards of smoking and the implementation of comprehensive tobacco control.[7,49] Researchers recently estimated that tobacco control efforts adopted in the wake of the first Surgeon General's report on smoking and health in 1964 have resulted in 8 million fewer premature smoking-related deaths, one-third of which are due to cancer.[50,51] Death rates for female breast cancer are down 35% from peak rates, and those from prostate and colorectal cancers are each down 47% as a result of improvements in early detection and treatments.[7,29,52,53]

In contrast to declining trends for the major cancers, joinpoint analysis indicates that death rates are rising in both sexes for cancers of the oropharynx, anus, liver, pancreas, and soft tissue (including the heart).[7] Death rates are also increasing for tonsil cancer and melanoma in men and for uterine cancer in women. Thyroid cancer death rates also increased, but only slightly, from 0.51 (per 100,000 population) in 2007 to 0.52 in 2011 among men and from 0.48 to 0.49 among women.

Recorded Number of Deaths in 2011

A total of 2,515,458 deaths were recorded in the United States in 2011, of which 576,691 (23%) were from cancer. Overall, cancer is the second leading cause of death following heart disease, which accounted for 24% of total deaths. However, cancer is expected to overtake heart disease as the leading cause of death within the next several years. In 2011, cancer was the leading cause of death among adults aged 40 to 79 years and was the first or second leading cause of death in every age group among women (Table 8).

Table 9 presents the number of deaths from all cancers combined and from the 5 most common sites for each 20-year age group by sex. More cancer deaths occur in men than in women except for those aged 20 to 39 years and 80 years or older. Breast cancer is the leading cause of cancer death in women aged 20 to 59 years, but is replaced by lung cancer in women aged 60 years or older. Among men, leukemia is the leading cause of cancer death for those aged 20 to 39 years, whereas lung cancer ranks first among men aged 40 years or older.

Cancer Occurrence by Race/Ethnicity

Cancer incidence and death rates vary considerably between and within racial and ethnic groups. Of the 5 broadly defined population groups in Table 10, black men have the highest overall cancer incidence and death rates—about double those of Asian/Pacific Islander (API) men, who have the lowest rates. Cancer incidence and death rates are higher among

TABLE 12. Incidence Rates for Selected Cancers by State, United States, 2007 to 2011

	ALL CANCERS		BREAST	COLORECTUM		LUNG & BRONCHUS		NON-HODGKIN LYMPHOMA		PROSTATE	URINARY BLADDER	
STATE	MALE	FEMALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	MALE	FEMALE
Alabama	568.8	396.5	118.4	55.6	38.7	100.6	54.8	19.7	13.7	153.7	33.4	7.8
Alaska	501.4	424.1	127.3	50.9	41.4	79.4	59.5	21.3	14.9	126.0	37.5	11.0
Arizona	432.8	373.5	111.6	41.1	31.4	60.7	47.7	18.7	13.6	100.9	32.7	8.4
Arkansas*†	552.7	385.1	109.8	55.2	38.7	106.7	60.2	21.9	14.8	149.6	33.7	7.8
California	499.2	396.3	122.4	47.9	36.3	58.0	43.1	23.0	15.6	136.4	33.1	7.9
Colorado	490.7	397.2	125.3	41.8	32.8	54.7	44.0	22.5	15.9	147.6	32.8	8.4
Connecticut	567.4	455.7	136.6	49.4	37.4	74.3	58.2	25.3	17.4	152.4	47.1	12.3
Delaware	589.5	444.9	128.0	49.1	37.5	86.0	63.4	23.4	16.9	168.1	43.1	11.4
Dist. of Columbia	579.8	435.7	143.4	51.2	43.7	75.3	47.2	21.0	12.9	198.2	25.1	9.1
Florida	514.2	400.5	114.6	46.6	35.4	77.4	56.0	21.9	15.1	128.3	35.0	8.6
Georgia	564.4	407.8	123.8	50.8	37.6	91.0	54.8	22.1	14.8	161.0	34.2	7.9
Hawaii	477.9	398.1	126.0	56.5	37.4	62.6	38.4	21.3	14.4	113.9	24.5	6.1
Idaho	526.2	411.2	118.8	44.9	34.5	61.2	47.1	22.5	17.0	155.0	38.7	9.0
Illinois	560.6	441.3	127.4	57.2	41.9	84.9	60.4	23.9	16.6	149.4	39.3	9.8
Indiana	522.5	424.5	118.5	52.9	41.1	95.0	62.9	23.5	16.8	117.4	35.9	8.8
Iowa	552.1	438.9	124.8	55.8	42.1	83.0	54.7	27.0	18.7	133.3	41.1	8.7
Kansas	552.5	424.7	122.5	52.4	38.5	78.2	54.0	23.6	16.3	152.6	38.7	9.3
Kentucky	604.0	464.2	120.7	62.4	45.0	122.9	80.7	24.9	17.2	128.8	40.4	9.8
Louisiana	601.6	416.6	121.3	60.8	43.5	96.9	57.0	24.3	16.6	168.9	34.3	8.1
Maine	563.6	454.9	126.4	48.4	39.3	88.1	66.2	25.3	17.5	133.9	48.1	13.0
Maryland	526.8	420.7	130.3	46.2	35.9	72.2	54.9	21.5	15.2	152.1	33.7	9.2
Massachusetts	558.7	460.0	135.6	47.6	37.6	77.1	63.6	24.8	16.4	148.9	42.8	11.9
Michigan	567.4	432.3	120.7	48.9	37.5	83.6	61.2	24.6	17.4	161.5	41.2	10.6
Minnesota‡	-	-	-	-	-	-	-	-	-	-	-	-
Mississippi	593.4	402.7	116.0	60.3	44.0	110.2	56.8	21.3	14.6	161.4	30.7	7.3
Missouri	519.8	423.3	122.6	53.2	39.4	93.0	63.7	22.1	15.9	121.8	34.0	8.5
Montana	519.6	425.3	125.8	48.6	38.5	68.8	54.7	23.0	15.3	147.2	37.6	10.1
Nebraska	513.6	421.4	121.8	54.9	42.9	72.2	50.8	23.7	17.8	136.6	35.0	8.5
Nevada*§	494.8	394.5	112.7	50.2	35.8	72.2	61.3	19.7	15.0	133.9	36.8	10.6
New Hampshire	573.2	454.4	134.1	45.1	38.0	78.8	62.8	25.3	17.5	151.7	49.6	13.5
New Jersey	576.6	450.0	129.5	52.6	39.9	71.4	55.1	25.1	17.9	166.1	42.7	11.4
New Mexico	447.8	362.2	110.0	43.0	32.2	51.2	37.7	17.9	13.4	124.4	25.7	6.2
New York	580.6	451.2	128.5	51.6	39.8	75.4	55.6	26.4	18.1	163.3	41.9	10.6
North Carolina	560.9	417.9	126.6	48.4	35.7	94.4	56.7	22.7	15.6	149.1	36.9	9.0
North Dakota	524.8	411.1	121.8	57.2	41.1	68.9	44.3	23.2	18.5	149.0	37.8	9.3
Ohio	531.6	421.6	120.0	51.8	38.9	89.4	59.9	22.6	15.6	135.8	38.5	9.4
Oklahoma	539.1	414.8	120.4	51.5	39.5	93.5	61.1	22.1	16.2	142.7	34.0	8.2
Oregon	505.2	429.6	129.4	44.5	35.3	69.1	57.8	22.5	15.5	134.4	37.8	9.5
Pennsylvania	571.5	456.9	126.8	54.3	41.1	83.2	57.6	25.6	17.8	145.9	44.3	11.1
Rhode Island	559.0	455.8	130.1	47.1	38.9	82.7	63.1	23.3	17.6	143.1	46.4	14.0
South Carolina	544.6	402.9	123.0	48.2	36.7	92.5	53.8	20.1	13.4	146.7	31.6	8.5
South Dakota	501.8	411.7	122.0	55.9	41.4	70.9	49.1	22.4	16.3	142.0	34.2	8.8
Tennessee	562.5	417.9	119.7	51.7	38.9	101.0	61.4	22.4	16.1	143.7	35.3	8.1
Texas	504.7	387.1	113.7	49.7	34.6	75.7	47.4	22.1	15.6	126.9	28.8	6.8
Utah	492.1	361.1	112.0	38.1	30.4	34.2	23.3	24.9	15.7	170.6	31.3	5.6
Vermont	528.9	441.4	129.1	43.3	36.1	77.2	64.0	24.7	17.2	133.4	39.5	11.1
Virginia	508.6	398.1	125.0	45.0	35.1	79.7	53.1	21.3	14.6	143.2	33.0	8.3
Washington	534.9	438.8	132.5	44.6	35.5	70.1	56.1	25.9	17.2	144.3	38.0	9.4
West Virginia	555.1	437.2	110.5	57.5	42.5	104.7	68.8	23.2	16.8	126.3	39.1	10.8
Wisconsin	532.9	426.8	124.8	47.4	37.1	73.2	54.1	24.7	17.3	139.2	40.0	10.0
Wyoming	488.5	387.1	112.1	44.0	35.5	56.3	45.6	20.1	14.5	143.4	37.8	10.6
United States	**535.8**	**419.1**	**122.8**	**50.0**	**37.8**	**78.6**	**54.6**	**23.2**	**16.1**	**142.1**	**36.7**	**9.1**

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

*This state's data are not included in the US combined rates because it did not meet high-quality standards for one or more years during 2007 to 2011 according to the North American Association of Central Cancer Registries (NAACCR).

†Rates are based on incidence data for 2007 to 2009.

‡This state's registry did not submit cancer incidence data to the NAACCR.

§Rates are based on incidence data for 2007 to 2010.

TABLE 13. Death Rates for Selected Cancers by State, United States, 2007 to 2011

STATE	ALL SITES MALE	ALL SITES FEMALE	BREAST FEMALE	COLORECTUM MALE	COLORECTUM FEMALE	LUNG & BRONCHUS MALE	LUNG & BRONCHUS FEMALE	NON-HODGKIN LYMPHOMA MALE	NON-HODGKIN LYMPHOMA FEMALE	PANCREAS MALE	PANCREAS FEMALE	PROSTATE MALE
Alabama	251.6	154.3	22.9	21.5	14.4	85.5	40.7	8.2	5.2	13.3	9.8	28.2
Alaska	215.4	155.0	22.7	19.6	13.9	62.8	45.3	8.2	4.7	13.4	9.2	22.6
Arizona	182.6	130.0	20.1	16.5	11.7	47.9	32.2	7.3	4.8	11.3	8.6	20.1
Arkansas	248.7	159.8	22.8	22.9	15.6	88.1	45.3	8.3	5.6	13.3	9.5	24.3
California	186.8	137.3	21.5	17.2	12.4	45.5	31.5	7.7	4.7	11.7	9.4	21.9
Colorado	177.7	130.5	19.3	15.8	12.0	42.8	30.3	7.4	4.3	10.8	9.1	22.8
Connecticut	195.7	141.3	20.8	15.3	11.4	51.3	37.2	7.3	4.8	13.8	9.9	21.5
Delaware	222.8	158.9	22.9	19.0	13.5	67.3	45.9	7.4	4.8	12.9	10.1	23.6
Dist. of Columbia	234.8	166.8	29.4	20.6	18.8	57.1	35.4	6.5	3.9	16.4	12.4	37.6
Florida	200.3	138.8	21.0	17.6	12.4	59.2	38.1	7.6	4.6	12.0	8.9	19.5
Georgia	222.9	146.3	23.1	19.8	13.5	70.1	38.1	7.5	4.3	12.3	9.1	26.0
Hawaii	175.8	115.6	15.2	17.6	10.7	46.7	25.5	7.4	4.3	12.8	9.7	15.6
Idaho	192.2	138.6	21.9	16.0	12.3	48.0	33.9	7.8	5.4	12.1	8.8	25.8
Illinois	218.9	156.4	23.4	20.7	14.8	64.2	41.6	8.3	5.1	13.0	10.0	23.3
Indiana	235.8	159.0	23.2	20.8	14.2	77.3	45.5	9.1	5.4	12.8	9.5	22.7
Iowa	211.1	147.1	20.7	20.0	14.8	63.2	38.1	8.8	5.3	12.3	8.9	21.7
Kansas	211.3	145.0	21.4	19.8	13.1	64.3	38.8	9.2	5.2	12.5	9.3	20.4
Kentucky	257.5	172.2	22.8	22.6	16.1	94.5	55.5	8.6	5.8	12.9	9.5	22.3
Louisiana	250.7	162.2	25.0	23.3	15.4	79.1	43.1	8.6	5.0	14.3	11.4	25.1
Maine	227.7	156.5	20.0	19.4	13.7	67.6	44.5	9.1	5.3	12.1	9.9	22.1
Maryland	211.8	150.2	23.9	19.6	13.2	58.9	39.7	7.5	4.5	13.2	10.1	23.7
Massachusetts	210.8	149.2	20.4	17.7	12.7	58.0	41.2	7.7	4.6	12.7	10.4	21.4
Michigan	219.4	157.1	23.5	19.1	13.7	66.5	43.5	8.9	5.6	13.8	10.0	21.1
Minnesota	201.1	143.0	20.7	17.2	12.1	51.9	36.1	9.4	5.2	12.0	9.2	23.4
Mississippi	264.7	157.0	24.2	24.6	16.5	92.0	41.3	8.0	4.6	13.8	10.0	29.6
Missouri	225.9	157.8	23.8	20.9	14.1	74.2	45.5	8.3	5.3	12.9	9.8	20.7
Montana	192.5	142.2	20.1	15.8	12.7	52.3	39.4	7.8	4.5	11.9	8.0	24.8
Nebraska	204.2	142.5	19.8	20.4	15.0	57.9	35.5	8.3	5.5	11.3	9.6	22.6
Nevada	206.9	151.7	23.5	21.0	14.3	58.0	45.2	6.9	4.4	12.8	9.6	22.8
New Hampshire	211.1	152.1	21.2	16.6	13.3	59.2	43.1	7.4	4.6	13.5	9.9	21.4
New Jersey	203.7	151.0	24.6	20.2	14.3	53.9	36.5	7.5	5.0	13.6	10.1	21.2
New Mexico	183.8	129.8	20.8	18.7	12.5	42.2	27.9	6.2	4.3	11.0	8.3	23.0
New York	196.6	143.4	22.0	18.5	13.3	52.9	35.8	7.7	4.8	12.9	9.9	21.4
North Carolina	227.7	147.2	22.7	18.8	12.7	74.4	39.9	7.5	4.8	11.8	9.4	24.6
North Dakota	200.0	133.1	21.1	20.8	13.1	52.7	31.4	6.7	4.6	12.8	8.1	22.6
Ohio	232.8	160.4	24.2	21.4	14.6	72.8	43.9	9.2	5.5	13.3	10.1	23.2
Oklahoma	238.2	159.7	23.5	22.1	14.3	78.4	46.2	8.8	5.6	12.3	9.2	23.1
Oregon	206.6	151.4	21.1	18.2	13.3	56.4	41.8	8.4	5.0	12.3	9.8	23.9
Pennsylvania	222.2	154.9	23.5	20.7	14.6	63.9	39.3	8.9	5.4	13.3	10.1	22.0
Rhode Island	217.5	147.5	20.6	18.1	13.4	63.9	42.6	7.7	4.2	12.3	8.7	21.3
South Carolina	236.1	150.0	23.5	19.9	13.7	74.9	39.0	7.7	4.6	13.1	10.0	26.3
South Dakota	201.4	143.9	21.1	18.9	13.6	60.0	35.0	7.6	5.1	10.4	9.7	22.1
Tennessee	251.1	158.1	22.7	21.7	15.3	86.5	45.7	8.9	5.1	13.1	9.6	24.0
Texas	205.2	139.7	21.3	19.4	12.8	58.6	34.5	7.8	4.7	11.8	8.9	20.4
Utah	154.6	109.1	20.8	14.0	10.3	26.5	16.2	7.3	4.6	10.3	8.0	24.6
Vermont	213.6	153.2	19.7	16.8	14.5	61.3	45.4	8.3	4.7	12.9	9.7	22.4
Virginia	216.7	149.1	23.5	18.3	13.5	64.7	39.1	8.2	4.7	12.7	9.6	23.9
Washington	205.7	149.7	21.1	16.7	12.6	55.6	41.0	8.6	5.1	12.8	10.1	23.4
West Virginia	246.1	167.8	22.5	23.7	15.6	82.3	49.8	8.4	6.2	11.9	7.8	20.7
Wisconsin	212.6	148.4	21.0	17.9	12.4	57.8	38.6	8.7	5.4	13.0	9.8	24.3
Wyoming	192.3	143.4	21.1	19.1	12.8	48.9	34.6	7.3	5.3	11.9	8.5	21.3
United States	**211.6**	**147.4**	**22.2**	**19.1**	**13.5**	**61.6**	**38.5**	**8.1**	**5.0**	**12.5**	**9.6**	**22.3**

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

black than white men for every site included in Table 10 with the exception of kidney cancer mortality, for which rates are similar. The largest disparities are for stomach and prostate cancers, for which death rates in black men are about 2.5 times those in white men. Factors known to contribute to racial disparities vary by cancer site and include differences in risk factor prevalence and access to high-quality health care, including cancer prevention and early detection, timely

TABLE 14. Trends in 5-Year Relative Survival Rates* (%) for Children (Birth to 14 Years) by Year of Diagnosis, United States, 1975 to 2010

	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 2003	2004 TO 2010
All sites	**58**	**62**	**67**	**68**	**72**	**76**	**77**	**79**	**81**	**83†**
Acute lymphocytic leukemia	57	66	71	72	78	83	84	87	90	92†
Acute myeloid leukemia	19	26	27‡	31‡	37‡	42	41‡	49	58	66†
Bones & joints	50‡	48	57‡	57‡	67‡	67	74	70	71	79†
Brain & other nervous system	57	58	57	62	64	64	71	75	74	74
Hodgkin lymphoma	81	87	88	90	87	97	95	96	95	98†
Neuroblastoma	53	57	55	52	63	76	67	66	72	77†
Non-Hodgkin lymphoma	43	53	67	70	71	77	81	83	90	86†
Soft tissue	61	74	69	73	66	80	77	71	79	81†
Wilms tumor	73	79	87	91	92	92	92	92	92	92†

*Survival rates are adjusted for normal life expectancy and are based on follow-up of patients through 2011.

†The difference in rates between 1975 to 1977 and 2004 to 2010 is statistically significant ($P < .05$).

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

diagnosis, and optimal treatment.[54,55] Even among Medicare-insured patients, blacks are less likely than whites to receive standard-cancer therapies for lung, breast, colorectal, and prostate cancers.[56] A major source of these inequalities is the disproportionately high burden of poverty in the black community. According to the US Census Bureau, 27% of blacks lived in poverty and 19% were without health insurance in 2012, compared with 10% and 11%, respectively, of non-Hispanic whites.[57]

Higher mortality rates among blacks compared with whites partly reflect a later stage of disease at diagnosis. This disparity is particularly striking for cancers of the uterine corpus, oral cavity, female breast, and cervix (Fig. 6). Moreover, black patients have lower stage-specific survival for most cancer types (Fig. 7). As a result, although black women have a lower breast cancer incidence rate than white women, they have a higher breast cancer death rate (Table 10). The higher incidence rate among white women is thought to reflect a combination of factors that affect both diagnosis (more prevalent mammography) and underlying disease occurrence (such as later age at first birth and greater use of menopausal hormone therapy).[58] The higher risk of death from breast cancer among black women is thought to reflect a higher prevalence of comorbidities, a longer time to follow-up after an abnormal mammogram, less receipt of high-quality treatment, and a higher prevalence of aggressive tumor characteristics.[59–61] However, an analysis of clinical trial data showed that black women were less likely than white women to survive their breast cancer despite uniform treatment, even after controlling for stage of disease, tumor characteristics, follow-up, and socioeconomic status.[62]

Cancer incidence and death rates are lower among APIs, American Indians/Alaska Natives (AI/ANs), and Hispanics than non-Hispanic whites for all cancer sites combined and for the 4 most common cancer sites. However, cancers associated with infectious agents (eg, those of the uterine cervix, stomach, and liver) are generally more common in nonwhite populations. For example, stomach and liver cancer incidence and death rates are twice as high in the API population as in whites, reflecting a higher prevalence of chronic infection with *Helicobacter pylori* and hepatitis B virus, respectively, in immigrant countries of origin.[63] Kidney cancer incidence and death rates are the highest among AI/ANs, which may be due in part to high rates of obesity, smoking, and hypertension in this population. Regional variation in the prevalence of these risk factors may contribute to striking geographic differences in kidney cancer death rates among AI/AN men, which are highest in the Southern and Northern Plains and lowest in the East and Pacific Coast.[64]

Table 11 shows the variation in trends in cancer incidence and death rates during the most recent 5 data years by race and ethnicity. These trends are based on incidence data from 2002 to 2011 covering 92% of the US population, but are not adjusted for reporting delays. Among men, the magnitude of decline for incidence rates is larger than that for death rates, while the opposite is generally true for women. Significant declines in incidence rates in women were confined to blacks (0.4% per year) and Hispanics (0.6% per year). Black men continue to have the largest decline in death rates (2.5% per year).

Regional Variations in Cancer Rates

Tables 12 and 13 depict current cancer incidence and death rates for selected cancers by state. The largest geographic variation in cancer occurrence by far is for lung cancer, reflecting the large historical and continuing differences in smoking prevalence among states.[49] For example, lung cancer incidence rates in Kentucky, which has historically had the highest smoking prevalence, are 3.5 times higher than those in Utah, which has the lowest smoking prevalence. There is a 2-fold difference for prostate cancer incidence rates, which range from 100.9 (per 100,000 population) in Arizona to 198.2 in the District of Columbia, likely reflecting both state differences in PSA testing prevalence and population demographics.[26] In contrast, state variations for other cancer types are smaller in both absolute and relative terms. For example, breast cancer incidence rates range from 109.8 (per 100,000 population) in Arkansas to 143.4 in the District of Columbia, a relative difference of just 23%. Some of this variation is attributable to differences in mammography prevalence.[65] State variation in cancer incidence rates reflects differences in the use of screening tests and diagnostic practices in addition to differences in the prevalence of risk factors, while the variation in death rates reflects differences in cancer occurrence and survival.

Cancer in Children

Cancer is the second most common cause of death among children aged 1 to 14 years in the United States, surpassed only by accidents. In 2015, an estimated 10,380 children (0-14 years) will be diagnosed with cancer (excluding benign/borderline brain tumors) and 1,250 will die from the disease. Benign and borderline brain tumors are not included in the estimated new cases for 2015 because the calculation method requires historic data and these tumors were not reportable until 2004. Leukemia (77% of which are lymphoid leukemias) accounts for 30% of all childhood cancers (including benign brain tumors). Cancers of the brain and other nervous system are the second most common cancer type (26%), followed by neuroblastoma (6%), soft tissue sarcomas (6%, one-half of which are rhabdomyosarcoma), renal (Wilms) tumors (5%), non-Hodgkin lymphomas (including Burkitt lymphoma) (5%), and Hodgkin lymphomas (3%).[8]

Cancers in adolescents (aged 15-19 years) differ somewhat from those in children in terms of type and distribution. For example, a smaller proportion of the cancers diagnosed in adolescents are leukemias and a larger proportion are lymphomas. Cancers of the brain and other nervous system are most common (20%), followed by leukemia (13%), Hodgkin lymphoma (13%), thyroid carcinoma (10%), and gonadal germ cell tumors (9%). Melanoma accounts for 5% of the cancers diagnosed in this age group.

From 2007 to 2011, the overall incidence rate for cancer increased by 0.6% per year in children and was stable in adolescents. In contrast, death rates have been declining for decades. From 1970 to 2011, the death rate for childhood cancer decreased 67% (from 6.3 to 2.1 per 100,000 population) and the death rate for adolescents decreased by 58% (from 7.2 to 3.0). Table 14 provides trends in survival rates for the most common childhood cancers. The 5-year relative survival rate for all cancer sites combined improved from 58% for children diagnosed during 1975-1977 to 83% for those diagnosed during 2004-2010. The substantial progress for all of the major childhood cancers reflects both improvements in treatment and high levels of participation in clinical trials.

Limitations

The projected numbers of cancer cases and deaths in 2015 should be interpreted with caution because they are model-based estimates that may vary considerably from year to year for reasons other than changes in cancer occurrence. For instance, estimates are affected by changes in method, which are implemented regularly as modeling techniques improve and surveillance coverage becomes more complete. In addition, the model is sometimes oversensitive or undersensitive to abrupt or large changes in observed data. Therefore, while these estimates provide a reasonably accurate portrayal of the contemporary cancer burden, they should not be used to track cancer occurrence over time. Age-standardized or age-specific cancer death rates from the NCHS and cancer incidence rates from SEER, NPCR, and/or NAACCR are the most informative indicators of cancer trends.

Errors in reporting race/ethnicity in medical records and on death certificates may result in underestimates of cancer incidence and mortality rates in nonwhite and nonblack populations. This is particularly relevant for AI/AN populations. It is also important to note that cancer data in the United States are primarily reported for broad racial and ethnic groups that are not homogenous, masking important differences in the cancer burden within these groups.

Conclusions

Cancer death rates have been continuously declining for the past 2 decades. Overall, the risk of dying from cancer decreased by 22% between 1991 and 2011. Regionally, progress has been most rapid for residents of the Northeast, among whom death rates have declined by 25% to 30%, and slowest in the South, where rates declined by about 15%. Further reductions in cancer death rates can be accelerated by applying existing cancer control knowledge across all segments of the population, with an emphasis on those in the lowest socioeconomic bracket and other disadvantaged populations. ■

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