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Cancer statistics, 2024

Rebecca L. Siegel MPH[1] | Angela N. Giaquinto MSPH[1] | Ahmedin Jemal DVM, PhD[2]

[1]Surveillance Research, American Cancer Society, Atlanta, Georgia, USA

[2]Surveillance and Health Equity Science, American Cancer Society, Atlanta, Georgia, USA

Correspondence
Rebecca L. Siegel, Surveillance Research, American Cancer Society, 270 Peachtree Street, Atlanta, GA 30303, USA.
Email: rebecca.siegel@cancer.org

Abstract

Each year, the American Cancer Society estimates the numbers of new cancer cases and deaths in the United States and compiles the most recent data on population-based cancer occurrence and outcomes using incidence data collected by central cancer registries (through 2020) and mortality data collected by the National Center for Health Statistics (through 2021). In 2024, 2,001,140 new cancer cases and 611,720 cancer deaths are projected to occur in the United States. Cancer mortality continued to decline through 2021, averting over 4 million deaths since 1991 because of reductions in smoking, earlier detection for some cancers, and improved treatment options in both the adjuvant and metastatic settings. However, these gains are threatened by increasing incidence for 6 of the top 10 cancers. Incidence rates increased during 2015–2019 by 0.6%–1% annually for breast, pancreas, and uterine corpus cancers and by 2%–3% annually for prostate, liver (female), kidney, and human papillomavirus-associated oral cancers and for melanoma. Incidence rates also increased by 1%–2% annually for cervical (ages 30–44 years) and colorectal cancers (ages <55 years) in young adults. Colorectal cancer was the fourth-leading cause of cancer death in both men and women younger than 50 years in the late-1990s but is now first in men and second in women. Progress is also hampered by wide persistent cancer disparities; compared to White people, mortality rates are two-fold higher for prostate, stomach and uterine corpus cancers in Black people and for liver, stomach, and kidney cancers in Native American people. Continued national progress will require increased investment in cancer prevention and access to equitable treatment, especially among American Indian and Alaska Native and Black individuals.

KEYWORDS
cancer cases, cancer statistics, death rates, incidence, mortality

INTRODUCTION

Cancer is the second-leading cause of death in the United States overall and the leading cause among people younger than 85 years. The coronavirus disease 2019 (COVID-19) pandemic caused delays in the diagnosis and treatment of cancer in 2020 because of health care setting closures, disruptions in employment and health insurance, and fear of COVID-19 exposure. The question of whether these delays lead to increased diagnosis of advanced-stage disease and, ultimately, higher cancer mortality at the population level will be answered gradually over many years. What is already well-established is the disproportionate direct and indirect impact of the pandemic on communities of color,[1,2] which may ultimately exacerbate cancer disparities.

In this article, we provide the estimated numbers of new cancer cases and deaths in 2024 in the United States nationally and for each state, as well as a comprehensive overview of cancer occurrence based on up-to-date population-based data for cancer incidence and mortality through 2020 and 2021, respectively. This includes coverage of incidence rates during the first year of the pandemic, when healthcare disruptions were at their peak. We also estimate the total number of cancer deaths averted through 2021 because of the continuous decline in the cancer death rate over the past several decades.

MATERIALS AND METHODS

Data sources

Population-based cancer incidence data in the United States have been collected by the National Cancer Institute's (NCI) 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 historic population-based incidence data (1975–2020) and currently contains data from the eight oldest SEER areas (Connecticut, Hawaii, Iowa, New Mexico, Utah, and the metropolitan areas of Atlanta, San Francisco-Oakland, and Seattle-Puget Sound), representing approximately 8% of the US population.[3] Historical survival data (1975–1977 and 1995–1997) are based on the SEER 8 areas plus the Detroit metropolitan area and were published previously.[4] Contemporary survival statistics are based on data from the SEER 8 registries plus the Alaska Native Tumor Registry, California, Georgia, Idaho, Kentucky, Louisiana, New Jersey, New York, and Texas,[5] representing 42% of the US population, with vital status follow-up through 2020. All 22 SEER registries (additionally Massachusetts and Illinois), covering 48% of the United States, were the source for the probability of developing cancer.

The North American Association of Central Cancer Registries (NAACCR) compiles and reports incidence data from 1995 forward for registries that participate in the SEER program and/or the NPCR. These data approach 100% coverage of the US population for the most recent years and were the source for the projected new cancer cases in 2024, contemporary incidence trends, cross-sectional incidence rates, and stage distribution.[6-8] The incidence data presented herein differ slightly from those published online in NAACCR's Cancer in North America Explorer website (apps.naaccr.org/explorer/) because we use 19 (vs. 20) age groups for age adjustment and do not have access to state-level delay-adjustment factors.[9]

Mortality data from 1930 to 2021 were provided by the National Center for Health Statistics (NCHS).[10–12] Forty-seven states and the District of Columbia met data quality requirements for reporting to the national vital statistics system in 1930, and Texas, Alaska, and Hawaii began reporting in 1933, 1959, and 1960, respectively. The methods for abstraction and age adjustment of historic mortality data are described elsewhere.[11,13] Contemporary 5-year mortality rates for Puerto Rico were obtained from the NCI and the Centers for Disease Control and Prevention joint website State Cancer Profiles (statecancerprofiles.cancer.gov).

All cancer cases were classified according to the *International Classification of Diseases for Oncology*, third edition, except childhood and adolescent cancers, which were classified according to the *International Classification of Childhood Cancer*.[14–16] Causes of death were classified according to the *International Classification of Diseases*.[17]

Statistical analysis

Incidence and mortality

All incidence and death rates were age standardized to the 2000 US standard population (19 age groups) and expressed per 100,000 persons (or per million for childhood cancer incidence), as calculated by the NCI's SEER*Stat software, version 8.4.2.[18] Mortality rates for 2020 and 2021 were calculated using population estimates based on the 2020 census, and thus 2020 rates differ from previous reports for which population estimates were based on projections from the 2010 census. The US Census Bureau will publish official intercensal population estimates in fall 2024 that will smooth the transition between estimates from 2010 to 2020 decennial census. For more information on population estimates issued by the US Census Bureau, see census.gov/programs-surveys/popest/guidance.html.

The probability of developing cancer was calculated using the NCI's DevCan software, version 6.9.0,[19] and the annual percent change (APC) in rates was quantified using the NCI's Joinpoint Regression Program, version 5.0.2.[20] Trends were described as increasing or decreasing when the APC was statistically significant based on a two-sided p value < .05 and otherwise were described as stable. Diagnoses in 2020 were excluded from trend and lifetime risk analyses because the Joinpoint and DevCan modeling programs were not designed to accommodate such a large single-year data anomaly as the 10% drop that occurred from 2019 to 2020 because of disruptions in health care related to the COVID-19 pandemic.[21]

All statistics presented herein by race are exclusive of Hispanic ethnicity for improved accuracy of classification. Racial misclassification for American Indian and Alaska Native (AIAN) individuals was further reduced by restricting incidence rates to Purchased/Referred Care Delivery Area counties and adjusting nationally representative mortality rates using classification ratios previously published by the NCHS.[22] Life tables by Hispanic ethnicity were published in 2018 and were used for relative survival comparisons between White and Black individuals.[23] Mortality rates by racial and ethnic group are presented for 2016–2020 using vintage 2020 bridged race population estimates because of unresolved differences in how information on race and ethnicity were collected in the 2020 census (for more information, see seer.cancer.gov/popdata/modifications.html).

Whenever possible, cancer incidence rates were adjusted for delays in reporting, which occur because of lags in case capture and data corrections. Delay adjustment provides the most accurate portrayal of contemporary cancer rates and thus is particularly

TABLE 1 Estimated new cancer cases and deaths by sex, United States, 2024.[a]

	Estimated new cases			Estimated deaths		
Cancer site	Both sexes	Male	Female	Both sexes	Male	Female
All sites	2,001,140	1,029,080	972,060	611,720	322,800	288,920
Oral cavity & pharynx	58,450	41,510	16,940	12,230	8700	3530
Tongue	19,360	13,870	5490	3320	2270	1050
Mouth	15,490	8730	6760	3060	1820	1240
Pharynx	21,830	17,710	4120	4300	3410	890
Other oral cavity	1770	1200	570	1550	1200	350
Digestive system	353,820	197,390	156,430	174,320	100,310	74,010
Esophagus	22,370	17,690	4680	16,130	12,880	3250
Stomach	26,890	16,160	10,730	10,880	6490	4390
Small intestine	12,440	6730	5710	2090	1150	940
Colon & rectum[b]	152,810	81,540	71,270	53,010	28,700	24,310
Colon[b]	106,590	54,210	52,380			
Rectum	46,220	27,330	18,890			
Anus, anal canal, & anorectum	10,540	3360	7180	2190	1000	1190
Liver & intrahepatic bile duct	41,630	28,000	13,630	29,840	19,120	10,720
Gallbladder & other biliary	12,350	5900	6450	4530	1950	2580
Pancreas	66,440	34,530	31,910	51,750	27,270	24,480
Other digestive organs	8350	3480	4870	3900	1750	2150
Respiratory system	252,950	130,090	122,860	130,450	69,880	60,570
Larynx	12,650	10,030	2620	3880	3120	760
Lung & bronchus	234,580	116,310	118,270	125,070	65,790	59,280
Other respiratory organs	5720	3750	1970	1500	970	530
Bones & joints	3970	2270	1700	2050	1100	950
Soft tissue (including heart)	13,590	7700	5890	5200	2760	2440
Skin (excluding basal & squamous)	108,270	64,220	44,050	13,120	8700	4420
Melanoma of the skin	100,640	59,170	41,470	8290	5430	2860
Other nonepithelial skin	7630	5050	2580	4830	3270	1560
Breast	313,510	2790	310,720	42,780	530	42,250
Genital system	427,800	310,870	116,930	70,100	36,250	33,850
Uterine cervix	13,820		13,820	4360		4360
Uterine corpus	67,880		67,880	13,250		13,250
Ovary	19,680		19,680	12,740		12,740
Vulva	6900		6900	1630		1630
Vagina & other genital, female	8650		8650	1870		1870
Prostate	299,010	299,010		35,250	35,250	
Testis	9760	9760		500	500	
Penis & other genital, male	2100	2100		500	500	
Urinary system	169,360	118,330	51,030	32,350	22,360	9990
Urinary bladder	83,190	63,070	20,120	16,840	12,290	4550
Kidney & renal pelvis	81,610	52,380	29,230	14,390	9450	4940
Ureter & other urinary organs	4560	2880	1680	1120	620	500

TABLE 1 (Continued)

Cancer site	Estimated new cases			Estimated deaths		
	Both sexes	Male	Female	Both sexes	Male	Female
Eye & orbit	3320	1780	1540	560	260	300
Brain & other nervous system	25,400	14,420	10,980	18,760	10,690	8070
Endocrine system	48,010	14,480	33,530	3300	1580	1720
Thyroid	44,020	12,500	31,520	2170	990	1180
Other endocrine	3990	1980	2010	1130	590	540
Lymphoma	89,190	49,220	39,970	21,050	12,330	8720
Hodgkin lymphoma	8570	4630	3940	910	550	360
Non-Hodgkin lymphoma	80,620	44,590	36,030	20,140	11,780	8360
Myeloma	35,780	19,520	16,260	12,540	7020	5520
Leukemia	62,770	36,450	26,320	23,670	13,640	10,030
Acute lymphocytic leukemia	6550	3590	2960	1330	640	690
Chronic lymphocytic leukemia	20,700	12,690	8010	4440	2790	1650
Acute myeloid leukemia	20,800	11,600	9,200	11,220	6290	4930
Chronic myeloid leukemia	9280	5330	3950	1280	750	530
Other leukemia[c]	5440	3240	2200	5400	3170	2230
Other & unspecified primary sites[c]	34,950	18,040	16,910	49,240	26,690	22,550

Note: These are model-based estimates that should be interpreted with caution and not compared with those for previous years.

[a]Rounded to the nearest 10; cases exclude basal cell and squamous cell skin cancer and in situ carcinoma except urinary bladder. Approximately 56,500 cases of female breast ductal carcinoma in situ and 99,700 cases of melanoma in situ will be diagnosed in 2024.

[b]Includes appendiceal cancer; deaths for colon and rectal cancers are combined because large numbers of deaths from rectal cancer are misclassified as colon.

[c]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.

important in trend analysis.[24] It has the largest effect on the most recent data years for cancers that are frequently diagnosed in outpatient settings (e.g., melanoma, leukemia, and prostate cancer). For example, the leukemia incidence rate for 2019 was 13% higher after adjusting for reporting delays (14.9 vs. 13.2 per 100,000 persons).[6]

Projected cancer cases and deaths in 2024

The most recent year for which incidence and mortality data are available lags 2–4 years behind the current year because of the time required for data collection, compilation, quality control, and dissemination. Therefore, we projected the numbers of new cancer cases and deaths in the United States in 2024 to estimate the contemporary cancer burden using two-step statistical modeling described in detail elsewhere.[25,26] Briefly, complete cancer diagnoses were estimated for every state from 2006 through 2020 based on reported high-quality delay-adjusted incidence data from 50 states and the District of Columbia (99.7% population coverage) and state-level variations in sociodemographic and lifestyle factors, medical settings, and cancer screening behaviors.[27] Counts were adjusted for the deficit in cases during March through May 2020 because of health care closures during the first months of the COVID-19 pandemic using data from 2018 and 2019. Modeled state and national counts were then projected forward to 2024 using a novel, data-driven joinpoint algorithm.[26] Basal cell and squamous cell skin cancers cannot be estimated because these diagnoses are not recorded by most cancer registries. Ductal carcinoma in situ of the female breast and in situ melanoma of the skin were estimated by approximating annual case counts from 2010 through 2019 based on NAACCR age-specific incidence rates and delay factors for invasive disease (delay factors are unavailable for in situ cases)[28] and US population estimates obtained using SEER*Stat software. Counts were then projected 5 years ahead based on the average APC generated by the Joinpoint regression model. The number of cancer deaths expected to occur in 2024 was estimated by applying the previously described data-driven Joinpoint algorithm to reported cancer deaths from 2007 through 2021 at the state and national levels, as reported by the NCHS.[26]

Other statistics

The number of cancer deaths averted in men and women because of the reduction in cancer death rates since the early 1990s was

TABLE 2 Estimated new cases for selected cancers by state, 2024.[a]

State	All sites	Female breast	Colon & rectum	Leukemia	Lung & bronchus	Melanoma of the skin	Non-Hodgkin lymphoma	Prostate	Urinary bladder	Uterine cervix	Uterine corpus
Alabama	30,270	4800	2570	780	4230	1400	1000	5180	1190	230	840
Alaska	3710	540	350	100	420	130	160	630	160	—[b]	140
Arizona	42,670	6830	3280	1260	4350	3020	1690	4630	2060	290	1380
Arkansas	19,100	2680	1570	580	2840	1040	720	2950	750	140	500
California	193,880	32,660	16,170	5700	16,920	10,570	8320	26,350	7330	1560	7140
Colorado	29,430	5150	2130	940	2660	1990	1180	4490	1200	190	870
Connecticut	23,550	3790	1580	750	2780	870	1040	3530	1120	120	870
Delaware	7340	1140	500	210	920	420	300	1320	350	—[b]	250
District of Columbia	3300	630	260	80	380	70	110	390	120	—[b]	150
Florida	160,680	23,160	11,920	6420	18,580	9880	7940	24,090	7520	1170	4860
Georgia	63,170	9840	4940	1920	7350	3470	2180	9620	2250	480	1890
Hawaii	8670	1440	770	210	850	520	350	1270	320	50	360
Idaho	11,120	1730	810	420	1070	890	460	1660	550	70	360
Illinois	78,200	11,870	6140	2210	9430	4000	3030	11,800	3090	510	2800
Indiana	42,710	6270	3390	1270	5930	2250	1660	6470	1840	310	1470
Iowa	20,930	3010	1620	760	2600	1380	850	3200	940	120	710
Kansas	16,640	2620	1420	500	2190	920	670	2820	710	120	470
Kentucky	30,630	4320	2630	890	5120	1490	1110	3510	1240	220	950
Louisiana	29,400	4230	2520	890	3740	1200	1050	4330	1100	200	690
Maine	10,700	1490	700	340	1600	530	410	1560	610	—[b]	400
Maryland	36,410	5950	2620	1060	4080	1810	1420	6150	1400	230	1390
Massachusetts	44,040	7150	2790	1300	5620	1530	1790	6420	1950	210	1600
Michigan	64,530	9410	4640	1880	8690	3080	2570	10,480	2870	390	2470
Minnesota	37,930	5480	2550	1310	3880	1660	1610	5210	1540	160	1220
Mississippi	18,170	2710	1700	470	2760	720	600	2680	650	150	540
Missouri	39,120	5980	3020	1220	5820	1760	1520	5510	1570	260	1360
Montana	7310	1070	550	250	740	540	280	1070	360	—[b]	220
Nebraska	11,790	1770	940	380	1190	660	470	2270	500	70	380
Nevada	18,250	2880	1520	580	2110	840	720	2230	780	140	540
New Hampshire	9880	1460	650	290	1290	570	400	1570	510	—[b]	390
New Jersey	57,740	8880	4240	1940	5600	2330	2490	9860	2540	370	2230
New Mexico	11,220	1780	960	370	950	560	470	1370	420	100	420
New York	122,990	19,160	8780	3860	14,200	4050	5010	20,630	5330	840	4610
North Carolina	69,060	11,190	4760	2240	8920	3960	2560	10,260	2750	450	2140
North Dakota	4610	630	370	170	530	270	180	1020	190	—[b]	130
Ohio	76,280	11,500	5890	2050	10,390	4290	2880	10,670	3380	510	2680
Oklahoma	24,450	3490	1930	770	3230	1170	890	3020	950	200	690
Oregon	26,200	4440	1860	760	3000	1350	1040	3000	1230	140	880
Pennsylvania	89,410	13,370	6550	2710	11,200	3870	3610	13,010	4290	510	3460

TABLE 2 (Continued)

State	All sites	Female breast	Colon & rectum	Leukemia	Lung & bronchus	Melanoma of the skin	Non-Hodgkin lymphoma	Prostate	Urinary bladder	Uterine cervix	Uterine corpus
Rhode Island	7210	1090	470	230	960	280	310	970	370	—[b]	270
South Carolina	34,650	5840	2580	950	4720	1930	1200	5920	1400	250	1150
South Dakota	5680	850	450	200	680	330	220	1300	250	—[b]	170
Tennessee	43,170	6720	3460	1250	6440	1910	1530	6150	1760	320	1280
Texas	147,910	23,290	12,260	4940	14,430	5340	5760	20,790	4720	1450	4790
Utah	13,560	2200	950	490	810	1490	600	2380	510	100	510
Vermont	4500	670	300	140	520	310	190	690	220	—[b]	170
Virginia	48,560	8180	3640	1320	5980	2480	1920	9200	1930	310	1690
Washington	44,470	7450	3140	1480	4780	2650	1890	6350	1910	290	1490
West Virginia	12,890	1690	1070	420	2150	580	480	1620	600	70	400
Wisconsin	39,750	5710	2610	1400	4610	2040	1630	6870	1690	180	1450
Wyoming	3320	510	270	110	330	240	120	570	170	—[b]	100
United States	2,001,140	310,720	152,810	62,770	234,580	100,640	80,620	299,010	83,190	13,820	67,880

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

[a]Rounded to the nearest 10; excludes basal cell and squamous cell skin cancers and in situ carcinomas except urinary bladder. Estimates for Puerto Rico are unavailable.

[b]The estimate is fewer than 50 cases.

estimated by summing the annual difference between the number of cancer deaths recorded and the number that would have been expected if cancer death rates had remained at their peak. The expected number of deaths was estimated by applying the 5-year age-specific and sex-specific cancer death rate in the peak year for age-standardized cancer death rates (1990 in men, 1991 in women) to the corresponding age-specific and sex-specific population in subsequent years through 2021.

SELECTED FINDINGS

Expected number of new cancer cases

Table 1 presents the estimated numbers of new invasive cancer cases in the United States in 2024 by sex and cancer type. In total, there will be approximately 2,001,140 new cancer cases, the equivalent of about 5480 diagnoses each day. In addition, there will be about 56,500 new cases of ductal carcinoma in situ in women and 99,700 new cases of melanoma in situ of the skin in 2024. The estimated numbers of new cases for selected cancers by state are shown in Table 2.

The lifetime probability of being diagnosed with invasive cancer is slightly higher for men (41.6%) than for women (39.6%; Table 3). It is believed that the higher risk in men for most cancer types largely reflects greater exposure to carcinogenic environmental and lifestyle factors, such as smoking, although a recent study suggests that other nonmodifiable differences also play a large role.[29] These may include height,[30,31] endogenous hormone exposure, and immune function and response.[32] Although age is the strongest determinant of cancer risk, the proportion of new diagnoses in adults aged 65 years and older decreased from 61% in 1995 to 58% during 2019–2020 despite the growth of this age group in the general population from 13% to 17%. In contrast, the proportion of adults aged 50–64 years increased in both the cancer patient population, from 25% to 30%, and the general population, from 13% to 19%. The shift toward more middle-aged patients likely in part reflects steep decreases in incidence of prostate and smoking-related cancers among older men and increased cancer risk in people born since the 1950s associated with changing patterns in known exposures, such as higher obesity, as well as others yet to be elucidated.[33] Notably, people aged younger than 50 years were the only one of these three age groups to experience an increase in overall cancer incidence during this time period.

Figure 1 depicts the most common cancers diagnosed in men and women in 2024. Prostate cancer, lung and bronchus (hereinafter *lung*) cancer, and colorectal cancer (CRC) account for almost one half (48%) of all incident cases in men, with prostate cancer alone accounting for 29% of diagnoses. For women, breast cancer, lung cancer, and CRC account for 51% of all new diagnoses, with breast cancer alone accounting for 32% of cases.

TABLE 3 Probability (%) of developing invasive cancer within selected age intervals by sex, United States, 2017–2019.[a]

Cancer site	Sex	Probability, %				
		Birth to 49 years	50–64 years	65–84 years	85 years and older	Birth to death
All sites[b]	Male	3.5 (1 in 29)	11.8 (1 in 8)	31.9 (1 in 3)	19.1 (1 in 5)	41.6 (1 in 2)
	Female	5.9 (1 in 17)	10.8 (1 in 9)	24.3 (1 in 4)	14.4 (1 in 7)	39.6 (1 in 3)
Breast	Female	2.1 (1 in 48)	4.0 (1 in 25)	7.2 (1 in 14)	2.6 (1 in 38)	13.0 (1 in 8)
Colon & rectum	Male	0.4 (1 in 239)	1.2 (1 in 83)	2.7 (1 in 37)	1.8 (1 in 57)	4.3 (1 in 23)
	Female	0.4 (1 in 265)	0.9 (1 in 117)	2.2 (1 in 46)	1.7 (1 in 60)	3.9 (1 in 25)
Kidney & renal pelvis	Male	0.3 (1 in 384)	0.7 (1 in 142)	1.5 (1 in 67)	0.6 (1 in 178)	2.3 (1 in 43)
	Female	0.2 (1 in 603)	0.3 (1 in 287)	0.8 (1 in 126)	0.3 (1 in 303)	1.4 (1 in 73)
Leukemia	Male	0.3 (1 in 375)	0.3 (1 in 287)	1.2 (1 in 82)	0.9 (1 in 117)	1.9 (1 in 53)
	Female	0.2 (1 in 488)	0.2 (1 in 448)	0.7 (1 in 136)	0.5 (1 in 196)	1.3 (1 in 75)
Lung & bronchus	Male	0.1 (1 in 840)	1.2 (1 in 82)	5.1 (1 in 20)	2.7 (1 in 37)	6.3 (1 in 16)
	Female	0.1 (1 in 738)	1.1 (1 in 90)	4.3 (1 in 23)	1.9 (1 in 52)	5.9 (1 in 17)
Melanoma of the skin[c]	Male	0.4 (1 in 243)	0.9 (1 in 116)	2.4 (1 in 42)	1.4 (1 in 73)	3.6 (1 in 28)
	Female	0.6 (1 in 160)	0.7 (1 in 153)	1.1 (1 in 92)	0.5 (1 in 188)	2.5 (1 in 41)
Non-Hodgkin lymphoma	Male	0.3 (1 in 395)	0.5 (1 in 196)	1.6 (1 in 63)	0.9 (1 in 105)	2.4 (1 in 42)
	Female	0.2 (1 in 528)	0.4 (1 in 264)	1.2 (1 in 86)	0.7 (1 in 153)	1.9 (1 in 52)
Prostate	Male	0.2 (1 in 449)	3.9 (1 in 26)	10.4 (1 in 10)	3.1 (1 in 32)	12.9 (1 in 8)
Thyroid	Male	0.2 (1 in 483)	0.2 (1 in 480)	0.3 (1 in 354)	0.1 (1 in 1429)	0.7 (1 in 153)
	Female	0.8 (1 in 124)	0.5 (1 in 200)	0.5 (1 in 217)	0.1 (1 in 1194)	1.7 (1 in 58)
Uterine cervix	Female	0.3 (1 in 337)	0.2 (1 in 554)	0.2 (1 in 564)	0.1 (1 in 1535)	0.7 (1 in 152)
Uterine corpus	Female	0.3 (1 in 303)	1.1 (1 in 91)	1.7 (1 in 58)	0.4 (1 in 239)	3.1 (1 in 32)

[a]For people free of cancer at the beginning of the age interval.

[b]All sites exclude basal cell and squamous cell skin cancers and in situ cancers except urinary bladder.

[c]Probabilities for non-Hispanic White individuals.

Expected number of cancer deaths

An estimated 611,720 people in the United States will die from cancer in 2024, corresponding to approximately 1680 deaths per day (Table 1). The greatest number of deaths are from cancers of the lung, colorectum, and pancreas. Table 4 provides the estimated number of deaths for these and other common cancers by state.

Approximately 340 people die each day from lung cancer—nearly 2.5 times more than the number of people who die from CRC, which ranks second in cancer deaths. Approximately 101,300 of the 125,070 lung cancer deaths (81%) in 2024 will be caused by cigarette smoking directly, with an additional 3500 caused by second-hand smoke.[34] The remaining balance of approximately 20,300 nonsmoking-related lung cancer deaths would rank as the eighth-leading cause of cancer death among sexes combined if it was classified separately.

Trends in cancer incidence

Figure 2 illustrates long-term trends in overall cancer incidence rates from 1975 through 2020, the first year of the COVID-19 pandemic. Observed rates in 2020 are about 9% lower than in 2019 overall, ranging from <1% for testicular cancer in men and brain cancer in women to 16% for melanoma in men and 18% for thyroid cancer in women.[21] The drop was also lower for childhood (4%) and adolescent (6.5%) cancers. These first population-based surveillance data covering the pandemic onset, when health care was most disrupted, suggest that the largest delays in diagnosis are for cancers that tend to be less fatal and/or asymptomatic, such as those detected incidentally during provider visits or imaging. Similarly, Negoita et al. recently reported much larger deficits in the observed-to-expected 2020 case counts for in situ and localized cancers than for advanced disease.[35] As described in the statistical methods herein, 2020 incidence rates are excluded from trend and lifetime risk analysis and are presented as separate data points in visualizations based on guidance from the NCI.[21]

The spike in incidence for males during the early 1990s shown in Figure 2 reflects a surge in the detection of asymptomatic prostate cancer as a result of rapid, widespread uptake of prostate-specific antigen (PSA) testing among previously unscreened men.[36] Thereafter, cancer incidence in men generally decreased until around 2013 but has since stabilized (Table 5). In women, the rate has inched up

Estimated New Cases

Male			Female		
Prostate	299,010	29%	Breast	310,720	32%
Lung & bronchus	116,310	11%	Lung & bronchus	118,270	12%
Colon & rectum	81,540	8%	Colon & rectum	71,270	7%
Urinary bladder	63,070	6%	Uterine corpus	67,880	7%
Melanoma of the skin	59,170	6%	Melanoma of the skin	41,470	4%
Kidney & renal pelvis	52,380	5%	Non-Hodgkin lymphoma	36,030	4%
Non-Hodgkin lymphoma	44,590	4%	Pancreas	31,910	3%
Oral cavity & pharynx	41,510	4%	Thyroid	31,520	3%
Leukemia	36,450	4%	Kidney & renal pelvis	29,230	3%
Pancreas	34,530	3%	Leukemia	26,320	3%
All sites	**1,029,080**		**All sites**	**972,060**	

Estimated Deaths

Male			Female		
Lung & bronchus	65,790	20%	Lung & bronchus	59,280	21%
Prostate	35,250	11%	Breast	42,250	15%
Colon & rectum	28,700	9%	Pancreas	24,480	8%
Pancreas	27,270	8%	Colon & rectum	24,310	8%
Liver & intrahepatic bile duct	19,120	6%	Uterine corpus	13,250	5%
Leukemia	13,640	4%	Ovary	12,740	4%
Esophagus	12,880	4%	Liver & intrahepatic bile duct	10,720	4%
Urinary bladder	12,290	4%	Leukemia	10,030	3%
Non-Hodgkin lymphoma	11,780	4%	Non-Hodgkin lymphoma	8,360	3%
Brain & other nervous system	10,690	3%	Brain & other nervous system	8,070	3%
All sites	**322,800**		**All sites**	**288,920**	

Estimates are rounded to the nearest 10, and cases exclude basal cell and squamous cell skin cancers and in situ carcinoma except urinary bladder. Estimates do not include Puerto Rico or other US territories. Ranking is based on modeled projections and may differ from the most recent observed data.

FIGURE 1 Ten leading cancer types for the estimated new cancer cases and deaths by sex, United States, 2024. Estimates are rounded to the nearest 10, and cases exclude basal cell and squamous cell skin cancers and in situ carcinoma except urinary bladder. Ranking is based on modeled projections and may differ from the most recent observed data.

since the early 1980s as increased incidence of several cancers (including breast, uterine corpus, and melanoma) offset declining trends for others (e.g., lung and CRC). Consequently, the sex gap has narrowed from a male-to-female incidence rate ratio of 1.59 (95% confidence interval [CI], 1.57–1.61) in 1992[4] to 1.14 (95% CI, 1.136–1.143) in 2020 for all ages combined,[7] although the rate among adults younger than 50 years is about 70% higher in women than in men because of the high incidence of breast and thyroid cancer.

The incidence of prostate cancer dropped by almost 40% from 2007 to 2014 (Figure 3) because of declines in the rate of localized tumors diagnosed through PSA testing, which decreased after the US Preventative Services Task Force (USPSTF) recommended against screening for men aged 75 years and older in 2008 and for all men (temporarily) in 2012 to reduce harms from overdiagnosis and overtreatment.[37,38] Since 2014, however, the prostate cancer incidence rate has risen by 3% per year, mostly driven by 4%–5% per year increases for regional-stage and distant-stage diagnoses that began as early as 2011.[7] Localized-stage disease also increased from 73.5 per 100,000 in 2014 to 84.8 per 100,000 in 2019, although the trend is not yet statistically significant. A recent study estimated that more than one half of men in the United States living with metastatic prostate cancer were initially diagnosed with localized or regional stage disease.[39]

Efforts are ongoing to revitalize beneficial prostate cancer screening while mitigating the harms from overdiagnosis and overtreatment through the use of molecular markers, magnetic resonance imaging-targeted biopsy,[40,41] and active surveillance of low-risk disease. A 15-year follow-up study of men with localized disease who were monitored with active surveillance found increased local progression and metastases but no significant difference in prostate cancer mortality versus prostatectomy or radiotherapy.[42] Nevertheless, uptake of active surveillance is slower in the United States compared with other countries,[43] with approximately 40% of men with low-risk disease actively treated in 2021.[44,45] PSA testing increased slightly after the USPSTF upgraded their recommendation to informed decision making in men aged 55–69 years in a 2017 draft statement that was finalized in 2018,[46-48] but it remains underutilized at only 35% in men aged 50 years and older overall and 31% among Black men, who benefit most because of more aggressive disease.[49-52] A recent review by Kensler et al. supports screening Black men from ages 45–75 years at potentially more frequent intervals than other men, as determined by baseline PSA, despite limited evidence,[53] consistent with long-standing American Cancer Society recommendations.[54]

Female breast cancer incidence rates have been slowly increasing by about 0.6% per year since the mid-2000s (Table 5), largely driven by diagnoses of localized-stage and hormone receptor-positive disease.[55] (The increase in the incidence of distant-stage disease during this time, by 0.7% per year, parallels a decline in unstaged cancers [by 1.3% per year][7] and thus likely reflects

TABLE 4 Estimated deaths for selected cancers by state, 2024.[a]

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	10,600	310	710	900	360	510	2550	280	200	850	560
Alaska	1220	–[b]	60	110	–[b]	70	210	–[b]	–[b]	80	60
Arizona	13,280	410	950	1220	590	560	2380	430	310	1090	890
Arkansas	6360	180	390	550	230	330	1670	190	110	470	360
California	59,930	2150	4570	5500	2330	3580	9320	2160	1410	5120	4200
Colorado	8480	300	700	820	370	370	1290	280	200	730	630
Connecticut	6440	230	420	470	290	300	1270	230	140	610	410
Delaware	2250	60	160	170	90	120	480	80	80	210	170
District of Columbia	980	–[b]	90	90	–[b]	70	160	–[b]	–[b]	90	70
Florida	48,110	1460	3160	3980	2020	2180	10,230	1560	1050	4070	2800
Georgia	18,740	570	1420	1660	670	860	3770	550	410	1560	1070
Hawaii	2650	50	180	240	90	170	470	100	90	240	180
Idaho	3200	90	240	300	150	120	550	120	80	290	210
Illinois	23,280	670	1680	2090	920	1060	4910	660	400	2100	1160
Indiana	14,280	350	910	1190	510	520	3390	460	250	1220	760
Iowa	6250	180	370	520	270	260	1360	230	130	510	300
Kansas	5660	180	370	490	240	220	1250	200	120	440	270
Kentucky	10,250	280	640	940	400	500	2630	330	130	750	440
Louisiana	8970	240	670	860	330	530	2120	290	170	730	440
Maine	3510	110	180	270	130	130	840	120	60	300	270
Maryland	10,310	310	830	1000	340	500	2,010	340	250	920	660
Massachusetts	12,410	440	730	860	480	600	2490	380	290	1140	700
Michigan	21,480	610	1350	1880	830	1000	4920	760	440	1900	1130
Minnesota	10,320	300	630	830	440	370	2140	390	210	900	660
Mississippi	6650	200	480	650	260	290	1580	160	120	500	410
Missouri	13,170	410	810	1050	490	600	3240	410	190	1040	650
Montana	2230	80	150	180	80	80	380	70	–[b]	140	140
Nebraska	3590	140	270	380	150	160	700	120	70	320	230
Nevada	5440	150	430	560	220	310	1050	200	100	460	370
New Hampshire	2930	100	180	190	100	130	620	90	60	240	170
New Jersey	15,110	500	1170	1330	630	620	2700	520	340	1440	740
New Mexico	3890	120	300	340	120	300	550	130	70	330	290
New York	30,990	940	2080	2700	1050	1260	6100	1000	780	3010	1630
North Carolina	20,820	570	1450	1670	780	1000	4640	630	360	1690	1170
North Dakota	1320	–[b]	70	110	60	–[b]	280	50	–[b]	110	70
Ohio	24,810	700	1630	2070	960	1000	5670	810	480	1910	1250
Oklahoma	8650	250	570	790	340	480	2070	280	170	590	410
Oregon	8670	270	580	640	350	480	1760	310	160	740	540
Pennsylvania	27,570	820	1820	2230	1070	1310	5570	930	570	2400	1500

TABLE 4 (Continued)

State	All sites	Brain & other nervous system	Female breast	Colon & rectum	Leukemia	Liver & intrahepatic bile duct	Lung & bronchus	Non-Hodgkin lymphoma	Ovary	Pancreas	Prostate
Rhode Island	2090	80	120	150	80	130	440	70	–[b]	190	110
South Carolina	11,100	340	780	920	420	520	2600	410	170	920	650
South Dakota	1780	60	100	160	80	100	400	80	–[b]	150	90
Tennessee	14,530	410	1020	1220	520	640	3730	450	300	1120	750
Texas	44,360	1330	3280	4410	1630	2960	8050	1430	960	3600	2360
Utah	3780	160	330	320	190	190	460	140	110	310	330
Vermont	1460	50	80	120	50	80	290	50	–[b]	120	120
Virginia	16,420	460	1160	1390	610	730	3380	500	340	1380	970
Washington	13,640	480	960	1070	520	720	2580	490	320	1240	880
West Virginia	4750	120	280	430	190	220	1220	120	80	330	210
Wisconsin	11,700	370	680	870	480	520	2380	410	230	1060	740
Wyoming	1320	–[b]	70	110	–[b]	50	210	–[b]	–[b]	90	70
United States	611,720	18,760	42,250	53,010	23,670	29,840	125,070	20,140	12,740	51,750	35,250

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

[a]Rounded to the nearest 10. Estimates for Puerto Rico are not available.

[b]The estimate is fewer than 50 deaths.

improved staging). In the past decade (2012–2019), the increase in incidence was steeper in women younger than 50 years (1.1% per year) than in those aged 50 years and older (0.5% per year). Rising incidence is attributed in part to a decreasing fertility rate and increasing obesity,[56] although excess body weight is not associated with premenopausal breast cancer.[57] These incidence trends are unlikely to be influenced by mammography prevalence, which has held steady in recent decades and through the pandemic; biennial screening among women aged 50–74 years remained at 76% from 2019 to 2021.[57] The incidence of uterine corpus cancer has also continued to increase by about 1% per year since the mid-2000s; although rates may be leveling off for White women, they continue to increase by >2% per year among Black, Hispanic, and Asian American and Pacific Islander women.

After decades of increase, thyroid cancer incidence rates have declined since 2014 by about 2% per year because of changes in clinical practice designed to mitigate overdetection, including recommendations against thyroid cancer screening by the USPSTF and for more restrictive criteria by professional societies for performing and interpreting biopsies.[58,59] Notably, however, diagnoses have not curtailed in adolescents aged 15–19 years, among whom rates have increased by 4%–5% per year in both girls and boys since at least 1998, although rates remain about five times higher in girls.[7] Data from autopsy studies indicate that the occurrence of clinically relevant tumors has remained stable since 1970 and is generally similar in men and women, despite three-fold higher overall incidence rates in women.[60,61]

Lung cancer incidence has declined at a steady pace since 2006 by 2.5% annually in men and by 1% annually in women (Table 5). The downturn began later and has been slower in women than in men because women took up cigarette smoking in large numbers later and were also slower to quit, including upticks in smoking prevalence in some birth cohorts.[62,63] In contrast, CRC incidence patterns have long been similar by sex, with rates declining since 2011/2012 by 1.3% and 1.5% per year in men and women, respectively. However, these declines are driven by adults aged 65 years and older and mask stable rates in those aged 50–64 years since 2011 and increases of 1%–2% per year in adults younger than 55 years since the mid-1990s.[64] Rising incidence in the United States and several other high-income countries since the mid-1990s[65] remains unexplained but likely reflects changes in lifestyle exposures that began with generations born circa 1950.[66]

After a long history of increasing trends, non-Hodgkin lymphoma incidence decreased by almost 1% per year in both men and women during 2015 through 2019, and liver cancer and perhaps melanoma have stabilized in men, although rates for both cancers continue to increase in women by about 2% per year (Table 5). In adults younger than 50 years, melanoma has stabilized in women, but liver cancer continues to increase by about 2% per year, whereas rates for both cancers have decreased in men by about 1% and 2.5% per year,

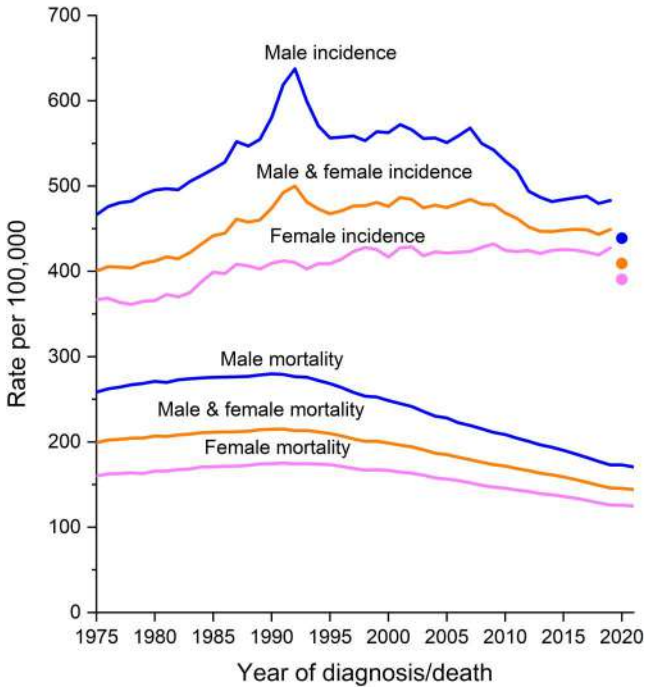

FIGURE 2 Trends in cancer incidence (1975–2020) and mortality (1975–2021) rates by sex, United States. Rates are age adjusted to the 2000 US standard population. Incidence rates are also adjusted for delays in reporting. Incidence data for 2020 are shown separate from trend lines.

respectively.[7] The decline in urinary bladder cancer since the mid-2000s accelerated from <1% per year to 1.7% per year during 2015 through 2019 overall, although trends vary by race and ethnicity; for example, rates only recently began to decrease in Black people (by <1% per year) and stabilize in AIAN people. Incidence continued to increase by 1.5% per year for kidney cancer, confined to a diagnosis of localized-stage disease, and by 1% per year for cancers of the pancreas and oral cavity and pharynx; increasing trends for oral cancers are confined to the diagnosis of cancers of the tongue, tonsil, and oropharynx (by 2.3% per year), which are associated with human papillomavirus (HPV), and for salivary gland, gum, and other mouth cancers (≤0.5% per year).

Cervical cancer incidence has decreased by more than one half since the mid-1970s because of the widespread uptake of screening and treatment of precursor lesions, although rates overall have stabilized in recent years. However, trends vary widely by age, and decades of decline have reversed in women aged 30–44 years, such that rates increased by 1.7% per year from 2012 through 2019. In sharp contrast, declines have accelerated in the youngest birth cohorts, who were first exposed to the HPV vaccine, which was first approved for use by the US Food and Drug Administration in 2006.[67,68] For example, invasive cervical cancer incidence in women aged 20–24 years decreased by 65% from 2012 to 2019 compared with 24% from 2005 to 2012. As vaccinated women age, the protective effect is carried forward into older age groups, such as women aged 25–29 years, among whom rates held steady at about 5.5 per 100,000 from 2005 to 2016 then dropped by 6.8% per year to 4.3 per 100,000 in 2019. These findings are consistent with an analysis by Mix et al., who reported declines in cervical squamous cell carcinoma of 22.5% per year from 2010 through 2017 among women aged 15–20 years.[69] Evidence for efficacy against other HPV-related cancers is also emerging. Approximately 90% of anal cancers are attributable to HPV infection,[67] and researchers in Denmark recently reported a 70% reduction in anal high-grade squamous intraepithelial lesions or cancer among women who were vaccinated before age 17 years.[70] Surprisingly large herd immunity[71] and single-dose efficacy[72,73] may facilitate protection against HPV-associated cancers, estimated at more than 37,000 diagnoses in total in the United States during 2015–2019.[74] In 2022, 76% of adolescents in the United States had received at least one vaccine dose, and 63% were up to date.[75]

Cancer survival

The 5-year relative survival rate for all cancers combined has increased from 49% for diagnoses during the mid-1970s to 69% during 2013–2019 (Table 6).[4,5] Current survival is highest for cancers of the thyroid (99%), prostate (97%), testis (95%), and melanoma (94%) and lowest for cancers of the pancreas (13%), liver and esophagus (22%), and lung (25%). Although screening has improved survival through earlier diagnosis of malignancies before symtpoms arise,[54] it further influences survival rates for breast, prostate, and lung cancers because of lead-time bias and the detection of indolent cancers,[76] which is likely also a factor for thyroid and other cancers commonly detected incidentally through imaging.[77]

Gains in survival have been especially rapid for hematopoietic and lymphoid malignancies because of improvements in treatment protocols, including the development of targeted therapies and immunotherapies. For example, the 5-year relative survival rate for chronic myeloid leukemia has more than tripled, from 22% in the mid-1970s to 70% for those diagnosed during 2013–2019, with tyrosine-kinase inhibitors providing most patients with near-normal life expectancy.[78] Although three generations of tyrosine-kinase inhibitors have now been approved, drug resistance and risk of progression to acute disease occurs in 5%–10% of patients with chronic myeloid leukemia and is an active area of research.[79]

A cascade of new therapies has also revolutionized the management of metastatic melanoma, including first-generation and second-generation immunotherapies (anti-CTLA4 and anti–PD-1 checkpoint inhibition) and BRAF and MEK inhibitors.[80,81] Consequently, 5-year relative survival for distant-stage melanoma has more than doubled from 18% for patients diagnosed in 2009 to 38% in 2015.[5] Immunotherapy has also shown promise in the neoadjuvant setting for resectable stage II–IV cutaneous squamous cell carcinoma,[82] as well as for nonsmall cell lung cancer. A phase 3 trial among patients with stage I–III nonsmall cell lung cancer reported a median progression-free survival of 20.8 months with

TABLE 5 Trends in incidence rates for selected cancers by sex, United States, 1998–2019.

	Trend 1		Trend 2		Trend 3		Trend 4		Trend 5		AAPC		
	Years	APC	Years	APC	Years	APC	Years	APC	Years	APC	2010–2015	2015–2019	2010–2019
All sites													
Overall	1998–2001	1.0[a]	2001–2004	-1.1[a]	2004–2007	0.8	2007–2012	-1.2[a]	2012–2019	0.0	-0.5[a]	0.0	-0.3[a]
Male	1998–2001	1.3[a]	2001–2004	-1.5[a]	2004–2007	0.6	2007–2013	-2.2[a]	2013–2019	-0.1	-1.3[a]	-0.1	-0.8[a]
Female	1998–2019	0.1[a]									0.1[a]	0.1[a]	0.1[a]
Female breast	1998–2001	-0.6	2001–2004	-3.1	2004–2019	0.6[a]					0.6[a]	0.6[a]	0.6[a]
Colon & rectum													
Overall	1998–2001	-1.3[a]	2001–2008	-2.7[a]	2008–2011	-4.2[a]	2011–2019	-1.4[a]			-1.9[a]	-1.4[a]	-1.7[a]
Male	1998–2003	-2.0[a]	2003–2012	-3.5[a]	2012–2019	-1.3[a]					-2.2[a]	-1.3[a]	-1.8[a]
Female	1998–2001	-1.4	2001–2007	-2.4[a]	2007–2011	-3.9[a]	2011–2019	-1.5[a]			-2.0[a]	-1.5[a]	-1.7[a]
Liver & intrahepatic bile duct													
Overall	1998–2002	2.4[a]	2002–2009	4.5[a]	2009–2015	3.2[a]	2015–2019	0.4			3.2[a]	0.4	2.0[a]
Male	1998–2002	3.0[a]	2002–2009	4.6[a]	2009–2015	2.9[a]	2015–2019	0.0			2.9[a]	0.0	1.6[a]
Female	1998–2003	0.9	2003–2014	4.0[a]	2014–2019	2.0[a]					3.6[a]	2.0[a]	2.9[a]
Lung & bronchus													
Overall	1998–2006	-0.3[a]	2006–2019	-1.7[a]							-1.7[a]	-1.7[a]	-1.7[a]
Male	1998–2006	-1.2[a]	2006–2019	-2.5[a]							-2.5[a]	-2.5[a]	-2.5[a]
Female	1998–2006	0.7[a]	2006–2019	-1.0[a]							-1.0[a]	-1.0[a]	-1.0[a]
Melanoma of skin													
Overall	1998–2001	6.4[a]	2001–2019	1.8[a]							1.8[a]	1.8[a]	1.8[a]
Male	1998–2001	5.6[a]	2001–2016	2.1[a]	2016–2019	0.1					2.1[a]	0.6	1.4[a]
Female	1998–2001	7.0[a]	2001–2019	1.7[a]							1.7[a]	1.7[a]	1.7[a]
Ovary	1998–2015	-1.5[a]	2015–2019	-2.7[a]							-1.5[a]	-2.7[a]	-2.1[a]
Oral cavity & pharynx													
Overall	1998–2004	-0.3	2004–2019	0.9[a]							0.9[a]	0.9[a]	0.9[a]
Male	1998–2004	-0.3	2004–2019	1.0[a]							1.0[a]	1.0[a]	1.0[a]
Female	1998–2003	-1.1[a]	2003–2019	0.6[a]							0.6[a]	0.6[a]	0.6[a]
Tongue, tonsil, oropharynx	1998–2009	2.7[a]	2009–2019	2.3[a]							2.3[a]	2.3[a]	2.3[a]
Other oral cavity	1998–2005	-2.3[a]	2005–2015	-0.4	2015–2019	-1.7[a]					-0.4[a]	-1.7[a]	-1.0[a]

(Continues)

TABLE 5 (Continued)

	Trend 1		Trend 2		Trend 3		Trend 4		Trend 5		AAPC		
	Years	APC	Years	APC	Years	APC	Years	APC	Years	APC	2010–2015	2015–2019	2010–2019
Pancreas													
Overall	1998–2019	1.1[a]									1.1[a]	1.1[a]	1.1[a]
Male	1998–2002	0.5	2002–2019	1.1[a]							1.1[a]	1.1[a]	1.1[a]
Female	1998–2019	1.1[a]									1.1[a]	1.1[a]	1.1[a]
Prostate	1998–2001	3.7[a]	2001–2004	-5.4[a]	2004–2007	3.1[a]	2007–2014	-6.4[a]	2014–2019	3.2[a]	-4.6[a]	3.2[a]	-1.2[a]
Thyroid													
Overall	1998–2009	7.2[a]	2009–2014	1.9[a]	2014–2019	-2.1[a]					1.1[a]	-2.1[a]	-0.4[a]
Male	1998–2009	6.7[a]	2009–2014	2.2[a]	2014–2019	-0.9[a]					1.6[a]	-0.9[a]	0.5[a]
Female	1998–2009	7.4[a]	2009–2014	1.8[a]	2014–2019	-2.5[a]					0.9[a]	-2.5[a]	-0.6[a]
Uterine cervix	1998–2003	-3.7[a]	2003–2013	-1.1[a]	2013–2016	1.6	2016–2019	-0.7			0.0	-0.1	-0.1
Uterine corpus	1998–2004	-0.5	2004–2019	1.3[a]							1.3[a]	1.3[a]	1.3[a]

Note: Trends were analyzed using the Joinpoint Regression Program, version 5.0.2 (National Cancer Institute), allowing up to four joinpoints.

Abbreviations: APC, annual percent change (based on incidence rates age adjusted to the 2000 US standard population and adjusted for delays in reporting); AAPC, average annual percent change.

[a]The APC or AAPC is significantly different from zero ($p < .05$).

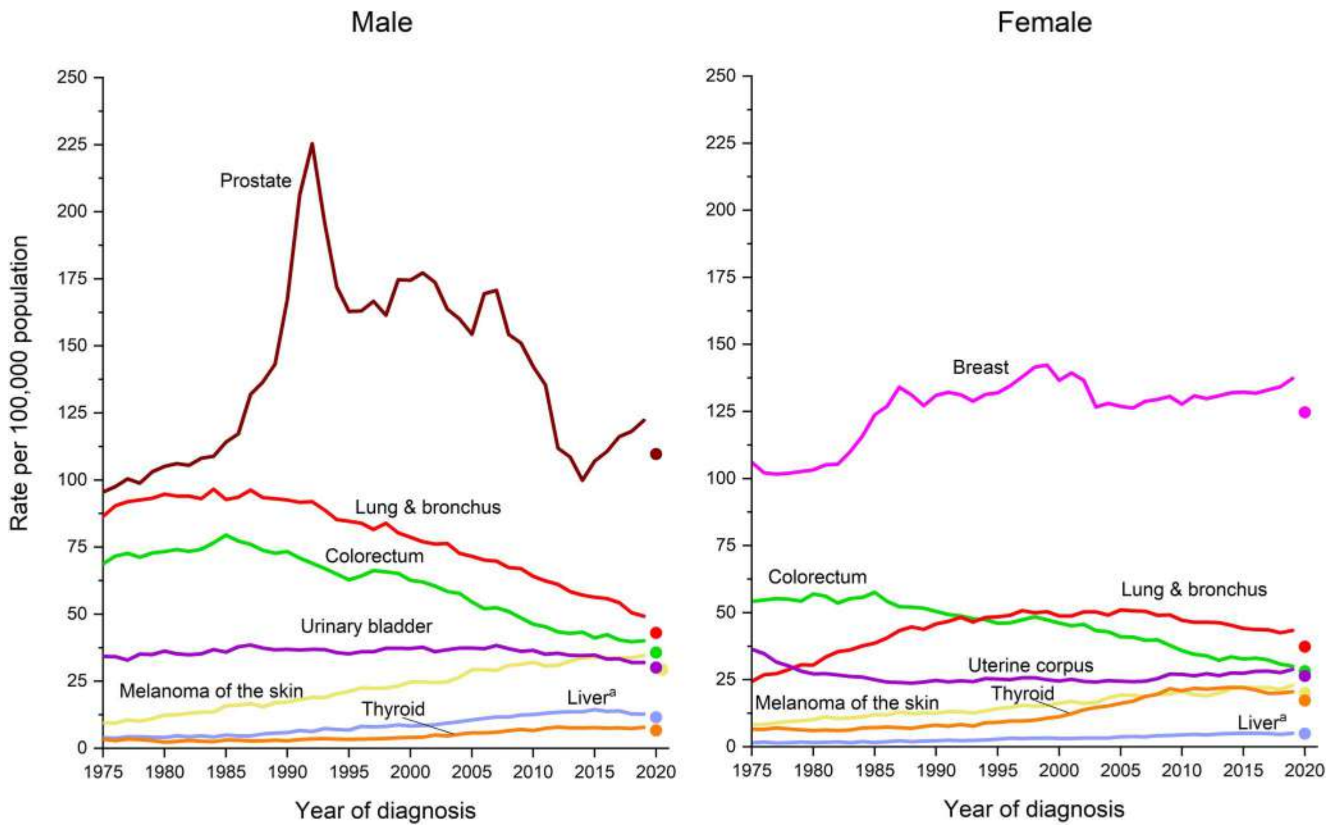

FIGURE 3 Trends in incidence rates for selected cancers by sex, United States, 1975–2020. Rates are age adjusted to the 2000 US standard population and adjusted for delays in reporting. Incidence data for 2020 are shown separate from trend lines. [a]Liver includes intrahepatic bile duct.

standard chemotherapy versus 31.6 months with the addition of nivolumab, including a pathologic complete response in 24% of patients.[83] At the population level, survival gains for lung cancer have largely been confined to nonsmall cell lung cancer, for which 3-year relative survival increased from 26% in 2004 to 40% in 2017 compared with an increase from 9% to 13% for small cell lung cancer.[5] Progress not only reflects improved disease management[84-86] but also earlier detection[87,88] and advances in staging.[89]

The only cancer for which survival has decreased over the past 4 decades is uterine corpus cancer.[90] Uterine corpus is the fourth most commonly diagnosed cancer in women and has the fastest increasing mortality (alongside HPV-associated oral cancer; Table 7) and one of the largest Black–White disparities (Table 8). Yet it ranked 24th in NCI research funding in 2018 ($17.5 million), an investment that is estimated to have dropped by 18% ($14.4 million) in 2021 (final analysis pending) despite a 9% increase in the overall budget.[91] The magnitude of underfunding is further increased in studies using lethality score ranking to account for disparities[92-94]; the 5-year relative survival rate is just 63% among Black women versus 84% among White women (Table 6). Lower survival partly reflects later stage diagnosis as only 56% of Black women are diagnosed with localized-stage disease versus 72% of White women (Figure 4), at least in part because of gaps in care. A recent study of Medicaid beneficiaries indicated that Black women had more provider visits preceding diagnosis and were one half as likely to receive guideline-concordant diagnostic procedures compared with White women.[95] Similarly, Black women are less likely than White women to receive guideline-concordant treatment,[96-98] contributing to lower survival for every stage of diagnosis, ranging from an absolute difference of 9% for localized stage to 21% for regional stage (73% vs. 53%; Figure 5). Some of the survival disparity reflects a higher prevalence of aggressive (nonendometrioid) subtypes, although Black women have the highest mortality rates of any racial or ethnic group for every histologic subtype.[99] A similar disparity occurs among Black women in the United Kingdom,[100] but not among those in the Caribbean,[101] underscoring the need for etiologic research. Although immune-checkpoint inhibitors have demonstrated welcome success in extending progression-free survival for advanced and recurrent endometrial cancer in clinical trials,[102-104] racial disparities will be exacerbated without equity in both genetic testing and drug dissemination. In contrast, stagnant survival trends for cervical cancer likely reflect in part an increased proportion of adenocarcinoma, which has poorer survival than squamous cell carcinoma,[105] because

TABLE 6 Trends in 5-year relative survival rates (%) by race, United States, 1975–2019.[a]

	All races & ethnicities			White			Black		
Cancer site	1975–1977	1995–1997	2013–2019	1975–1977	1995–1997	2013–2019	1975–1977	1995–1997	2013–2019
All sites	49	63	69	50	64	69	39	54	65
Brain & other nervous system	23	32	34	22	31	31	25	39	39
Breast (female)	75	87	91	76	89	93	62	75	83
Colon & rectum[b]	50	61	64	50	62	65	45	54	59
Colon[b]	51	61	63	51	62	64	45	54	57
Rectum	48	62	67	48	62	67	44	55	65
Esophagus	5	13	22	6	14	23	4	9	17
Hodgkin lymphoma	72	84	89	72	85	90	70	82	88
Kidney & renal pelvis	50	62	78	50	62	78	49	62	77
Larynx	66	66	62	67	68	62	58	52	55
Leukemia	34	48	67	35	50	68	33	42	61
Liver & intrahepatic bile duct	3	7	22	3	7	21	2	4	21
Lung & bronchus	12	15	25	12	15	25	11	13	23
Melanoma of the skin	82	91	94	82	91	94	57[c]	76[c]	71
Myeloma	25	32	60	24	32	59	29	32	61
Non-Hodgkin lymphoma	47	56	74	47	57	76	49	49	70
Oral cavity & pharynx	53	58	69	54	60	70	36	38	55
Ovary	36	43	51	35	43	50	42	36	42
Pancreas	3	4	13	3	4	12	2	4	11
Prostate	68	97	97	69	97	98	61	94	97
Stomach	15	22	36	14	20	36	16	22	37
Testis	83	96	95	83	96	97	73[c,d]	86[c,d]	91
Thyroid	92	95	99	92	96	99	90	95	97
Urinary bladder	72	80	78	73	81	79	50	63	65
Uterine cervix	69	73	67	70	74	68	65	66	57
Uterine corpus	87	84	81	88	86	84	60	62	63

[a]Rates are age adjusted for normal life expectancy and are based on cases diagnosed in the Surveillance, Epidemiology, and End Results (SEER) 9 areas for 1975–1977 and 1995–1997 and in the SEER 22 areas for 2013–2019; all cases were followed through 2020. Rates for White and Black patients diagnosed during 2013–2019 are exclusive of Hispanic ethnicity.

[b]Excludes appendiceal cancers.

[c]The standard error is between 5 and 10 percentage points.

[d]Survival rate is for cases diagnosed from 1978 to 1980.

of the disproportionate detection of cervical intraepithelial neoplasia and early invasive squamous cell carcinoma during cytology screening.[106]

Survival rates are lower for Black individuals than for White individuals for every cancer type shown in Figure 5 except prostate, pancreas, and kidney cancers, for which the rates are similar. However, kidney cancer survival is lower in Black patients for every histologic subtype and is only similar overall because of a higher proportion than Whites of papillary and chromophobe renal cell carcinomas, which have a better prognosis than other subtypes.[107] The largest Black–White survival differences in absolute terms are for melanoma (23%) and cancers of the uterine corpus (21%), oral cavity and pharynx (15%), and urinary bladder (14%). Although these disparities partly reflect a later stage at diagnosis (Figure 4), Black individuals have lower stage-specific survival for most cancer types (Figure 5). After adjusting for stage, sex, and age, the risk of cancer death is 33% higher in Black people and 51% higher in AIAN people compared with White people.[108]

TABLE 7 Trends in mortality rates for selected cancers by sex, United States, 1975–2021.

	Trend 1		Trend 2		Trend 3		Trend 4		Trend 5		Trend 6		AAPC		
	Years	APC	Years	APC	Years	APC	Years	APC	Years	APC	Years	APC	2012–2017	2017–2021	2012–2021
All sites															
Overall	1975–1990	0.5[a]	1990–1993	-0.3	1993–2002	-1.1[a]	2002–2016	-1.5[a]	2016–2019	-2.2[a]	2019–2021	-0.6[a]	-1.7[a]	-1.4[a]	-1.6[a]
Male	1975–1980	0.9[a]	1980–1992	0.2[a]	1992–2001	-1.5[a]	2001–2015	-1.8[a]	2015–2019	-2.3[a]	2019–2021	-0.6[a]	-2.0[a]	-1.5[a]	-1.7[a]
Female	1975–1990	0.6[a]	1990–1994	-0.2	1994–2002	-0.8[a]	2002–2016	-1.4[a]	2016–2019	-2.0[a]	2019–2021	-0.4	-1.5[a]	-1.2[a]	-1.4[a]
Female breast	1975–1990	0.4[a]	1990–1995	-1.8[a]	1995–1998	-3.3[a]	1998–2013	-1.9[a]	2013–2021	-1.0[a]			-1.2[a]	-1.0[a]	-1.1[a]
Colon & rectum															
Overall	1975–1984	-0.5[a]	1984–2001	-1.8[a]	2001–2011	-2.9[a]	2011–2021	-1.7[a]					-1.7[a]	-1.7[a]	-1.7[a]
Male	1975–1979	0.6	1979–1987	-0.6[a]	1987–2002	-1.9[a]	2002–2005	-4.0[a]	2005–2014	-2.5[a]	2014–2021	-1.6[a]	-2.0[a]	-1.6[a]	-1.8[a]
Female	1975–1984	-1.0[a]	1984–2001	-1.8[a]	2001–2011	-2.9[a]	2011–2021	-1.8[a]					-1.8[a]	-1.8[a]	-1.8[a]
Liver & intrahepatic bile duct															
Overall	1975–1980	0.2	1980–1987	2.0[a]	1987–1996	3.8[a]	1996–2000	0.8	2000–2015	2.5[a]	2015–2021	-0.3	1.4[a]	-0.3	0.6[a]
Male	1975–1985	1.5[a]	1985–1996	3.8[a]	1996–1999	0.3	1999–2013	2.7[a]	2013–2017	0.6	2017–2021	-1.1[a]	1.0[a]	-1.1[a]	0.1
Female	1975–1986	0.7[a]	1986–1995	3.4[a]	1995–2008	1.1[a]	2008–2013	3.4[a]	2013–2021	1.0[a]			1.5[a]	1.0[a]	1.3[a]
Lung & bronchus															
Overall	1975–1980	3.0[a]	1980–1990	1.8[a]	1990–1995	-0.2	1995–2005	-1.0[a]	2005–2013	-2.3[a]	2013–2021	-4.3[a]	-3.9[a]	-4.3[a]	-4.1[a]
Male	1975–1982	1.8[a]	1982–1991	0.4[a]	1991–2005	-1.9[a]	2005–2014	-3.1[a]	2014–2018	-5.5[a]	2018–2021	-4.0[a]	-4.5[a]	-4.4[a]	-4.5[a]
Female	1975–1983	5.8[a]	1983–1990	4.1[a]	1990–1995	1.8[a]	1995–2005	0.2	2005–2013	-1.7[a]	2013–2021	-3.8[a]	-3.4[a]	-3.8[a]	-3.6[a]
Melanoma of skin															
Overall	1975–1988	1.6[a]	1988–2013	0.0	2013–2017	-6.3[a]	2017–2021	-1.1					-5.1[a]	-1.1[a]	-3.3[a]
Male	1975–1989	2.3[a]	1989–2013	0.3[a]	2013–2017	-6.8[a]	2017–2021	-1.2					-5.4[a]	-1.2[a]	-3.6[a]
Female	1975–1988	0.8[a]	1988–2013	-0.5[a]	2013–2017	-5.7[a]	2017–2021	-0.6					-4.7[a]	-0.6	-2.9[a]
Oral cavity & pharynx															
Overall	1975–1991	-1.5[a]	1991–2000	-2.6[a]	2000–2009	-1.4	2009–2021	0.6[a]					0.6[a]	0.6[a]	0.6[a]
Male	1975–2007	-2.1[a]	2007–2021	0.6[a]									0.6[a]	0.6[a]	0.6[a]
Female	1975–1989	-0.9[a]	1989–2009	-2.2[a]	2009–2021	0.4							0.4	0.4	0.4
Tongue, tonsil, oropharynx	1975–2000	-1.6[a]	2000–2009	-0.2	2009–2021	1.9[a]							1.9[a]	1.9[a]	1.9[a]
Other oral cavity	1975–1992	-1.6[a]	1992–2006	-2.9[a]	2006–2021	-0.7[a]							-0.7[a]	-0.7[a]	-0.7[a]

(Continues)

TABLE 7 (Continued)

	Trend 1		Trend 2		Trend 3		Trend 4		Trend 5		Trend 6		AAPC		
	Years	APC	Years	APC	Years	APC	Years	APC	Years	APC	Years	APC	2012–2017	2017–2021	2012–2021
Ovary	1975–1982	-1.2[a]	1982–1992	0.3[a]	1992–1998	-1.1[a]	1998–2004	0.2	2004–2021	-2.4[a]			-2.4[a]	-2.4[a]	-2.4[a]
Pancreas															
Overall	1975–2002	-0.1	2002–2005	0.9	2005–2021	0.2							0.2[a]	0.2	0.2[a]
Male	1975–1986	-0.8[a]	1986–2000	-0.3	2000–2021	0.3[a]							0.3[a]	0.3[a]	0.3[a]
Female	1975–1983	0.8[a]	1983–2021	0.2[a]									0.2[a]	0.2[a]	0.2[a]
Prostate	1975–1987	0.9[a]	1987–1990	3.3[a]	1990–1993	0.8	1993–2013	-3.6[a]	2013–2021	-0.2			-0.9[a]	-0.2	-0.6[a]
Uterine corpus	1975–1993	-1.5[a]	1993–2007	0.1	2007–2021	1.7[a]							1.7[a]	1.7[a]	1.7[a]

Note: Trends were analyzed using the Joinpoint Regression Program, version 5.0.2 (National Cancer Institute), allowing up to five joinpoints.

Abbreviations: APC, annual percent change (based on mortality rates age adjusted to the 2000 US standard population); AAPC, average annual percent change.

[a]The APC or AAPC is significantly different from zero ($p < .05$).

Trends in cancer mortality

Mortality rates are a better indicator of progress against cancer than incidence or survival because they are less affected by detection biases, such as those that can occur for screen-detected cancers.[109] The cancer death rate rose during most of the 20th century (Figure 6), largely because of a rapid increase in lung cancer deaths among men as a consequence of the tobacco epidemic. However, reductions in smoking as well as improvements in disease management and the uptake of screening have resulted in an overall drop in the cancer death rate of 33% from 1991 through 2021, translating to an estimated 4.1 million fewer cancer deaths (2,794,900 in men and 1,344,600 in women) than if mortality had remained at its peak (Figure 7). The number of averted deaths is twice as large for men than for women because the death rate in men peaked higher, declined faster, and remains higher (Figure 6).

Cancer mortality trends are largely driven by lung cancer, for which declines accelerated from 2% per year during 2005–2013 to 4% per year during 2013–2021 because of earlier detection and treatment advances that have extended survival similarly in men and women.[88] The lung cancer death rate has dropped by 59% from the peak in men in 1990 and by 36% from the peak in women in 2002. Nevertheless, lung cancer still causes far more deaths each year than colorectal, breast, and prostate cancers combined. Although screening has been shown to reduce lung cancer mortality by 16%–24% in high-risk individuals by detecting asymptomatic malignancies that are more amenable to curative-intent treatment,[110,111] uptake remained low at approximately 6% in 2020 among the 14.2 million individuals who met contemporaneous screening guideline criteria.[112] New guidelines from the American Cancer Society that recommend annual lung cancer screening for healthy individuals aged 50 to 80 years who have a ≥20 pack-year smoking history, regardless of time since quitting, expand eligibility to an additional 5 million people and further increase the potential to avert lung cancer deaths.[113]

Long-term reductions in mortality for CRC—the second-most common cause of cancer death in men and women combined—have resulted from changing patterns in risk factors, like smoking reductions and screening uptake, as well as from improved treatment. The CRC death rate has dropped by 55% among males since 1980 and by 60% among females since 1969. (The rate in women began declining before 1969, but those data are not exclusive of cancer in the small intestine). Contemporary trends in CRC are remarkably similar by sex, with rates decreasing during the most recent decade (2012–2021) by 1.8% per year in both men and women (Table 7).

Female breast cancer mortality peaked in 1989 and has since decreased by 42% through 2021, translating to the avoidance of more than 490,000 deaths. This progress is attributed to earlier diagnosis through mammography screening and increased awareness, coupled with improvements in treatment. Declines in breast cancer mortality have slowed in recent years, from 2% to 3% annually during the 1990s and 2000s to 1% annually from 2013 to 2021 (Table 7), reflecting

TABLE 8 Leading causes of death in the United States in 2021 versus 2020.

Cause of death		2021			2020		Absolute change in no. of deaths
		No.[a]	Rate[b]	Percent	No.[a]	Rate[b]	
All causes		3,464,231	846.9		3,383,729	860.0	80,502
1	Heart diseases	695,547	168.7	20%	696,962	170.9	-1415
2	Cancer	605,213	144.2	17%	602,350	145.6	2863
3	COVID-19[c]	416,893	104.1	12%	350,831	85.0	66,062
4	Accidents (unintentional injuries)	224,935	64.1	6%	200,955	57.5	23,980
5	Cerebrovascular diseases	162,890	39.8	5%	160,264	39.6	2626
6	Chronic lower respiratory diseases	142,342	33.9	4%	152,657	37.1	-10,315
7	Alzheimer disease	119,399	29.5	3%	134,242	33.4	-14,843
8	Diabetes mellitus	103,294	25.0	3%	102,188	25.1	1106
9	Chronic liver disease and cirrhosis	56,585	14.4	2%	51,642	13.2	4943
10	Nephritis, nephrotic syndrome, and nephrosis	54,358	13.2	2%	52,547	12.9	1811

Abbreviation: COVID-19, coronavirus disease 2019.

[a]Counts include those with unknown age.

[b]Rates are per 100,000 and age adjusted to the 2000 US standard population. Rates for 2020 may differ from those published previously due to updated population denominators.

[c]Rates for this cause are based on previously published population denominators and include persons of unknown age.

Source: National Center for Health Statistics, Centers for Disease Control and Prevention, 2023.

relatively stable mammography prevalence over the past 2 decades and perhaps increased incidence. Prostate cancer mortality rates were stable from 2013 through 2021 after declining by almost 3%–4% annually since the mid-1990s, likely reflecting the uptick in advanced-stage diagnoses over the past decade (Table 7, Figure 6).[114,115] Prostate cancer mortality has declined by 53% since the peak in 1993 because of earlier detection through widespread screening with the PSA test and advances in treatment.[116,117]

The third-leading cause of cancer death in men and women combined is pancreatic cancer, for which mortality has increased slowly by 0.3% per year since 2000 in men (after decreasing in previous decades) and, in women, since at least 1975, mirroring incidence patterns. Liver cancer mortality continued to increase in women by 1% per year from 2013 to 2021 but has begun to decline in men after decades of increase. Declines in mortality of 1%–2% per year during 2017–2021 for leukemia, melanoma, and kidney cancer, despite stable or increasing incidence, underscore advances in treatment and perhaps some overdetection. In contrast, accelerated declines in mortality for ovarian cancer, from 1% per year during the 1990s to 2.4% per year from 2004 through 2021, closely mirror incidence patterns (Tables 5 and 7) and likely reflect reductions in risk related to increased use of oral contraceptives and decreased use of menopausal hormone therapy. Mortality rates continue to increase by about 2% per year for uterine corpus cancer, with a steeper pace among minority women, widening racial disparities.[118] For example, the Black-White mortality rate ratio increased from 1.84 (95% confidence interval [CI], 1.73–1.95) in 2020 to 1.99 (95% CI, 1.89–2.08; Figure 8). Death rates for HPV-associated oral cancers (tongue, tonsil, and oropharynx) also continue a 2% per year rise (Table 7).

Overall mortality trends are driven by deaths in older adults that reflect cumulative exposure to cancer risk factors over a lifetime. However, the best indicator of progress against cancer is patterns in young adults, which manifest more recent exposures.[119] Although the death rate for all cancers combined in adults younger than 50 years has decreased by almost 2% per year since at least 1975 in both men and women, trends vary by site. In men younger than 50 years, for example, steep reductions in the death rate for lung cancer (of >4% per year on average since 1975) and leukemia have coincided with increases for CRC to completely shift the mortality burden over the past 2 decades (Figure 9). In 1998, lung cancer was the leading cause of cancer death in young adult men, causing two and one half times more deaths than fourth-ranking CRC (4027 vs. 1638); however, by 2021, this pattern had reversed such that CRC caused almost twice as many deaths as lung cancer, which dropped to third after brain and other nervous system tumors. In young women, CRC also ranked fourth until 1999 but has similarly supplanted lung cancer to become the second-leading cause of cancer death after breast cancer, which still leads by a large margin (2251 deaths in 2021). Notably, cervical cancer has moved up to become the third most common cancer death among young women after an uptick since 2019 (Figure 9).

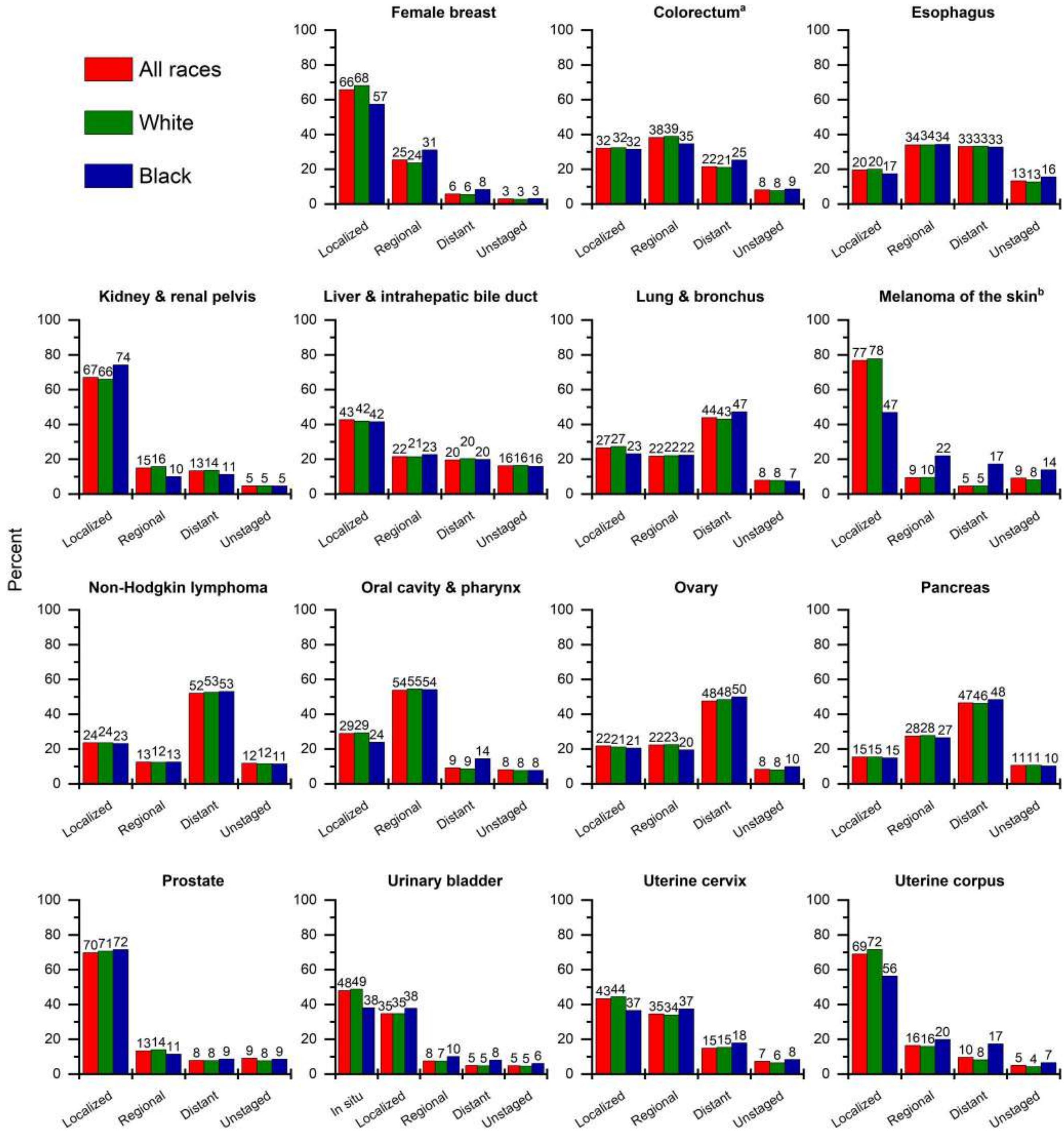

FIGURE 4 Stage distribution for selected cancers by race, United States, 2016–2020. White and Black race categories are exclusive of Hispanic ethnicity. Stage categories do not sum to 100% because sufficient information is not available to stage all cases. [a]Colorectum excludes appendiceal cancer. [b]The proportion of patients who had melanoma with unknown stage increased after 2015, when collaborative staging rules were no longer in effect.

Recorded number of deaths in 2021

In 2021 a total of 3,464,231 deaths were recorded in the United States, an increase of 80,502 deaths over 2020, most of which were likely caused by COVID-19 (Table 8). There were almost 20% more COVID-19 deaths in 2021 (416,893) than in 2020 (350,831), and the age-adjusted rate increased from 85 to 104.1 per 100,000 persons. A recent analysis found that the United States had approximately two-fold to four-fold higher death rates than 20 peer countries for both COVID-19 and excess all-cause mortality during June 2021 through March 2022.[120] Although the cancer death rate declined from 2020 to 2021, the absolute number of cancer deaths increased by 2863

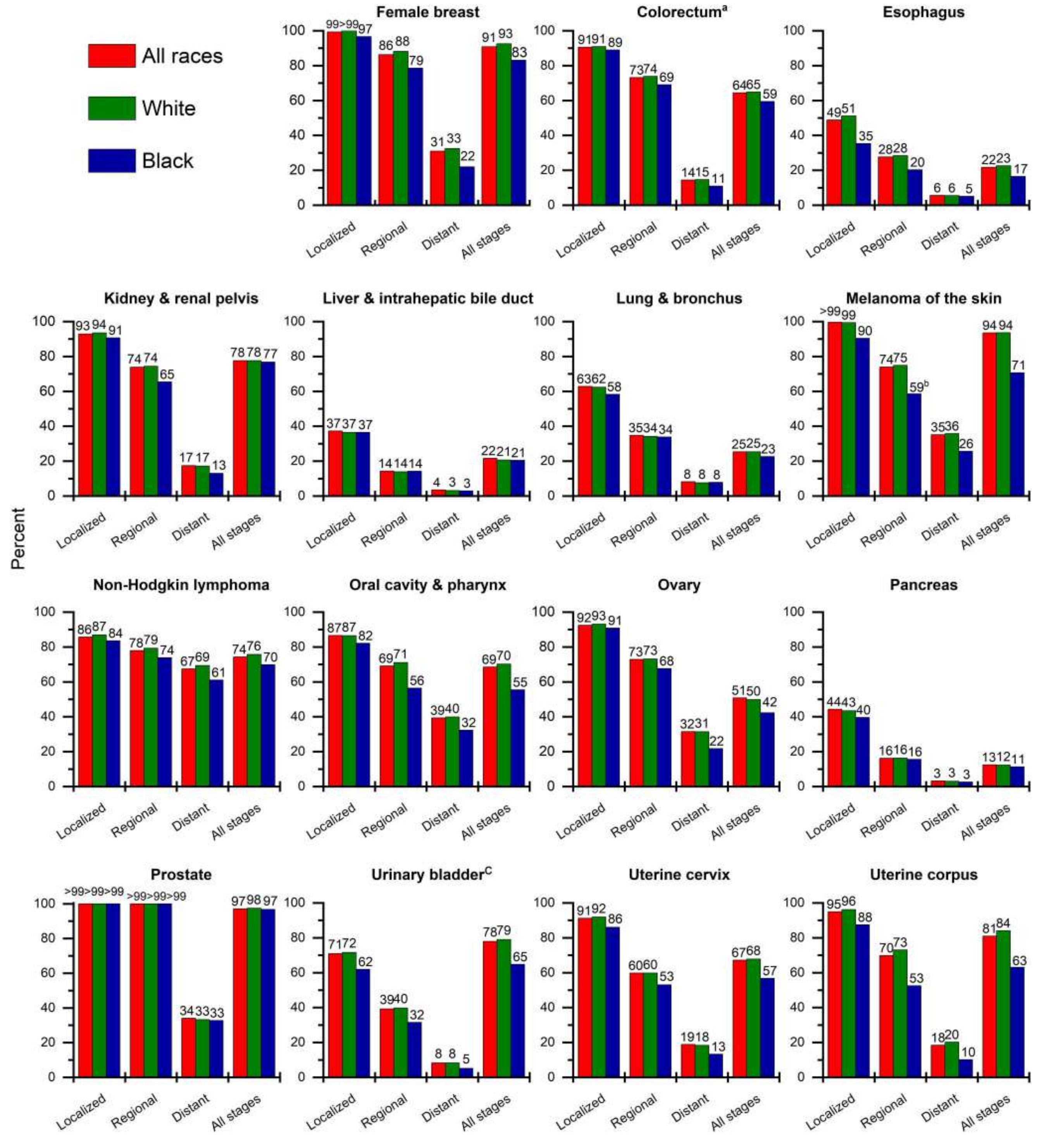

FIGURE 5 Five-year relative survival for selected cancers by race and stage at diagnosis, United States, 2013–2019. All patients were followed through 2020. White and Black race categories are exclusive of Hispanic ethnicity. [a]Colorectum excludes appendiceal cancer. [b]The standard error of the survival rate is between 5 and 10 percentage points. [c]The survival rate for patients with carcinoma in situ of the urinary bladder is 96% in all races, 96% in White patients, and 94% in Black patients.

because of the aging and growth of the population. In addition, the age-standardized rate of cancer-*related* mortality (i.e., cancer as an underlying or contributing cause) increased from 2019 to 2020 and again in 2021 after decades of decline, likely as a secondary consequence of the COVID-19 pandemic.[121]

In 2021, cancer accounted for 17% of all deaths and remained the second-leading cause of death after heart diseases. However, it is the leading cause of death among women aged 40–79 years and men aged 60–79 years (Table 9). COVID-19 was the second-leading cause of death in women aged 20–59 years and men

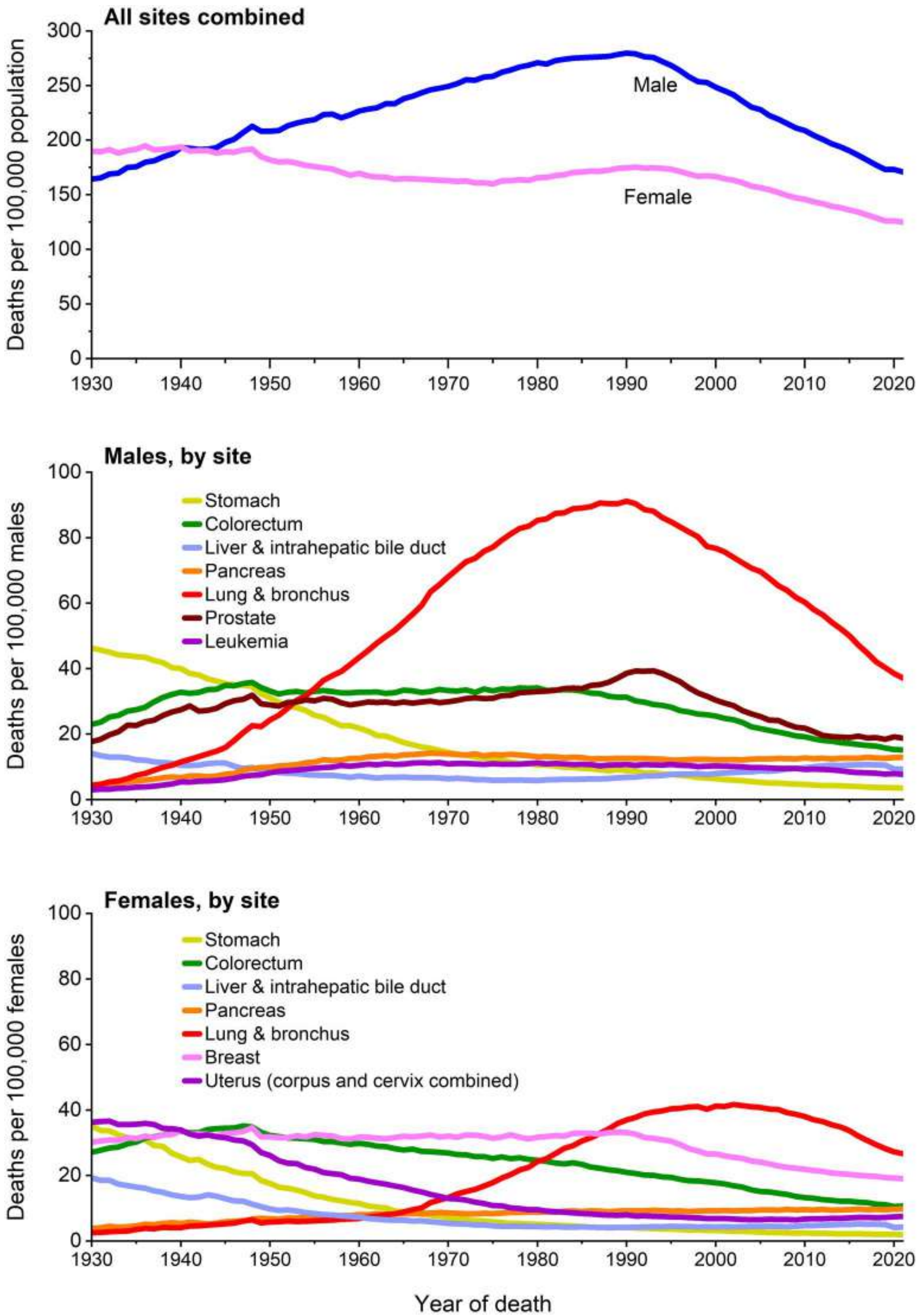

FIGURE 6 Trends in cancer mortality rates by sex overall and for selected cancers, United States, 1930–2021. Rates are age adjusted to the 2000 US standard population. Because of improvements in International Classification of Diseases coding over time, numerator data for cancers of the lung and bronchus, colon and rectum, liver, and uterus differ from the contemporary time period. For example, rates for lung and bronchus include pleura, trachea, mediastinum, and other respiratory organs.

aged 40–59 years. Table 10 presents the number of deaths in 2021 for the five leading cancer types by age and sex. Brain and other nervous system tumors are the leading cause of cancer death among children and adolescents younger than 20 years, and CRC and breast cancer lead among men and women, respectively, aged 20–49 years. Despite being one of the most preventable cancers, cervical cancer is consistently the second-leading cause of cancer death in women aged 20–39 years. Lung cancer is the leading cause of cancer death in both men and women aged 50 years and older.

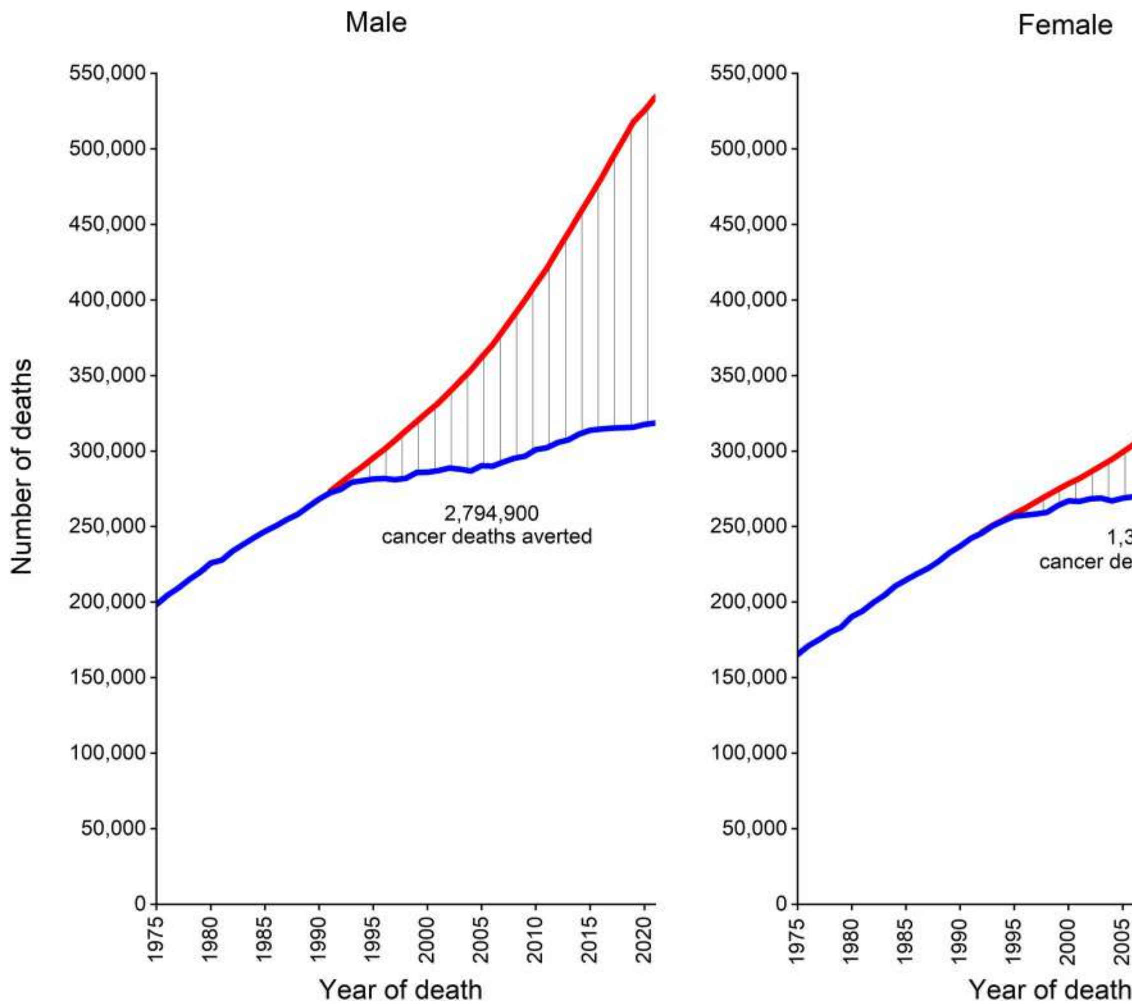

FIGURE 7 The total number of cancer deaths averted during 1991–2021 in men and 1992–2021 in women, United States. The blue line represents the actual number of cancer deaths recorded in each year, and the red line represents the number of cancer deaths that would have been expected if cancer death rates had remained at their peak.

Cancer disparities by race and ethnicity

Overall cancer incidence is highest among AIAN people, followed closely by White and Black people (Table 11). However, sex-specific incidence is highest in Black men, among whom rates during 2016–2020 were 79% higher than those in Asian American or Pacific Islander (AAPI) men (533.9 vs. 299 per 100,000), who have the lowest rates of any sex-race group. The high incidence in Black men is largely because of their extraordinary burden of prostate cancer, with rates 68% higher than White men, two times higher than AIAN and Hispanic men, and three times higher than AAPI men. Excluding prostate cancer, Black men rank third in overall cancer incidence, with a rate 15% lower than White men and 18% lower than AIAN men. Among women, AIAN women have the highest incidence, which is 4% higher than White women and 14% higher than Black women, who rank second and third, respectively.

Cancer mortality overall and by sex is highest among AIAN people, who have rates approximately two-fold higher than AAPI and Hispanic people, although striking disparities exist for every broadly defined racial and ethnic group (Table 11). For example, Black women not only have two-fold higher uterine corpus cancer mortality compared with White women, as mentioned earlier, but they also have 41% higher breast cancer mortality despite 4% lower incidence, a gap that has remained relatively unchanged since the mid-2000s. The overall Black–White disparity in cancer mortality has declined from a peak of 33% in 1993 (279.0 vs. 210.5 per 100,000 persons, respectively) to 13% during 2016–2020, largely driven by greater declines in smoking-related cancers among Black people because of a steep drop in smoking initiation from the mid-1970s until the early 1990s among Black youth.[122]

Racial disparities in cancer occurrence and outcomes are largely the result of structural racism, resulting in longstanding inequalities in wealth that lead to differences in exposure to risk factors and access to high-quality cancer prevention, early detection, and treatment.[123,124] Segregationist and discriminatory policies in criminal justice, housing, education, and employment continue to alter the balance of prosperity even today.[125] In 2022, 25% of AIAN

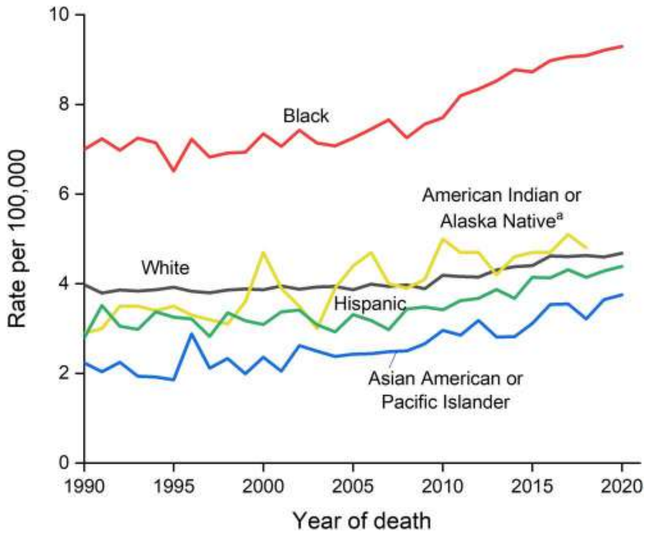

FIGURE 8 Trends in uterine corpus cancer mortality rates by race and ethnicity, United States, 1990–2020. Rates are age adjusted to the 2000 US standard population. Race categories are exclusive of Hispanic ethnicity. [a]Rates for American Indian/Alaska Native are 3-year moving averages and are adjusted for misclassification using factors from the National Center for Health Statistics.

people lived below the federal poverty level ($27,750 for a family of four), as well as 17% of Black and Hispanic people, compared to 9% of White and Asian people.[126] Persistent poverty is a risk factor for poor health and mortality, ranking among the leading causes of death alongside smoking.[127] Poverty is consistently associated with higher cancer incidence, later stage diagnosis, and worse outcomes.[128-130]

Racial disparities in cancer diagnosis and treatment are continuously chronicled in the scientific literature. Accumulating evidence shows that the overtly racist historical practice of mortgage lending discrimination known as redlining is associated with later stage diagnosis, less likelihood of receiving recommended treatment, and higher cancer mortality.[131-135] In addition to being less likely to receive high-quality diagnostic evaluation for uterine corpus cancer, as mentioned earlier,[95] Black women are also less likely to receive a provider referral for mammography[136] and timely follow-up after an abnormal screening test.[137] Furthermore, mammography screening and other routine health care that was suspended early in the pandemic have been slower to rebound among people of color.[138] In addition, Asian, Black, and Hispanic people are less likely to receive recommended germline genetic testing necessary for the receipt of game-changing treatments,[139] such as the immunotherapy that has been shown to extend progression-free 24-month survival by threefold for patients with advanced mismatch-repair–deficient endometrial cancer.[104] Five-year relative cancer survival is lower among Black people (67%) than among White people (72%) even when socioeconomic status is high,[130] and Black children are 24% more likely to be diagnosed with distant-stage childhood cancer than White children, regardless of family insurance status.[140] The economic burden of racial and ethnic health inequalities was recently estimated at $421–$451 billion in 2018, mostly because of the poor health of Black individuals.[141]

Geographic variation in cancer occurrence

Tables 12 and 13 show cancer incidence and mortality for selected cancers by state. Geographic variation reflects population demographic characteristics and differences in the prevalence of cancer risk factors and early detection practices, as well as access to care, which differs substantially across the United States. States have a large influence on the health of residents by controlling accessibility and affordability of health insurance through the Marketplace and Medicaid.[142,143] The 10 southern and midwestern states that have not expanded Medicaid eligibility have the highest cancer mortality and lowest life expectancy.[144,145] These states include Texas, where 17% of residents were uninsured in 2022 compared to 2% in Massachusetts, which has the lowest prevalence.[146] In addition, states enact laws and implement programs and regulations that help shape health care provider density, especially in rural areas, and fund initiatives to improve health, such as the Delaware effort that eliminated racial disparities in CRC in 1 decade.[147]

The largest differences in cancer occurrence are for the most preventable cancers, such as lung cancer, cervical cancer, and melanoma of the skin. For example, lung cancer incidence rates are three times higher in Kentucky, West Virginia, and Arkansas (75–84 per 100,000 persons) than in Utah (25 per 100,000 persons), reflecting wide historical differences in smoking that still persist. In 2021, the highest smoking prevalence was in West Virginia (24%), Arkansas (22%), and Kentucky, Mississippi, Tennessee, and Louisiana (20%) compared with 7% in Utah and 9% in California and the District of Columbia.[52]

Despite being one of the most preventable cancers, cervical cancer incidence varies two-fold by state, ranging from five per 100,000 women in New Hampshire, Massachusetts, Vermont, Minnesota, and Connecticut; to 10 per 100,000 women in West Virginia, Kentucky, and Oklahoma; and 12 per 100,000 women in Puerto Rico (Table 12). Ironically, advances in cancer control typically exacerbate disparities because of the unequal dissemination of interventions. Although HPV vaccination can virtually eliminate cervical cancer[148] and prevent against numerous other cancers, large state differences in coverage will likely widen existing disparities. In 2021, up-to-date HPV vaccination among boys and girls aged 13–17 years ranged from 33% in Mississippi to 79% in the District of Columbia and 75% in Massachusetts and South Dakota.[52]

Cancer in children and adolescents

Cancer is the second most common cause of death among children aged 1–14 years in the United States, surpassed only by accidents, and is the fourth most common cause of death among adolescents (aged 15–19 years). In 2024, an estimated 9620 children (aged birth

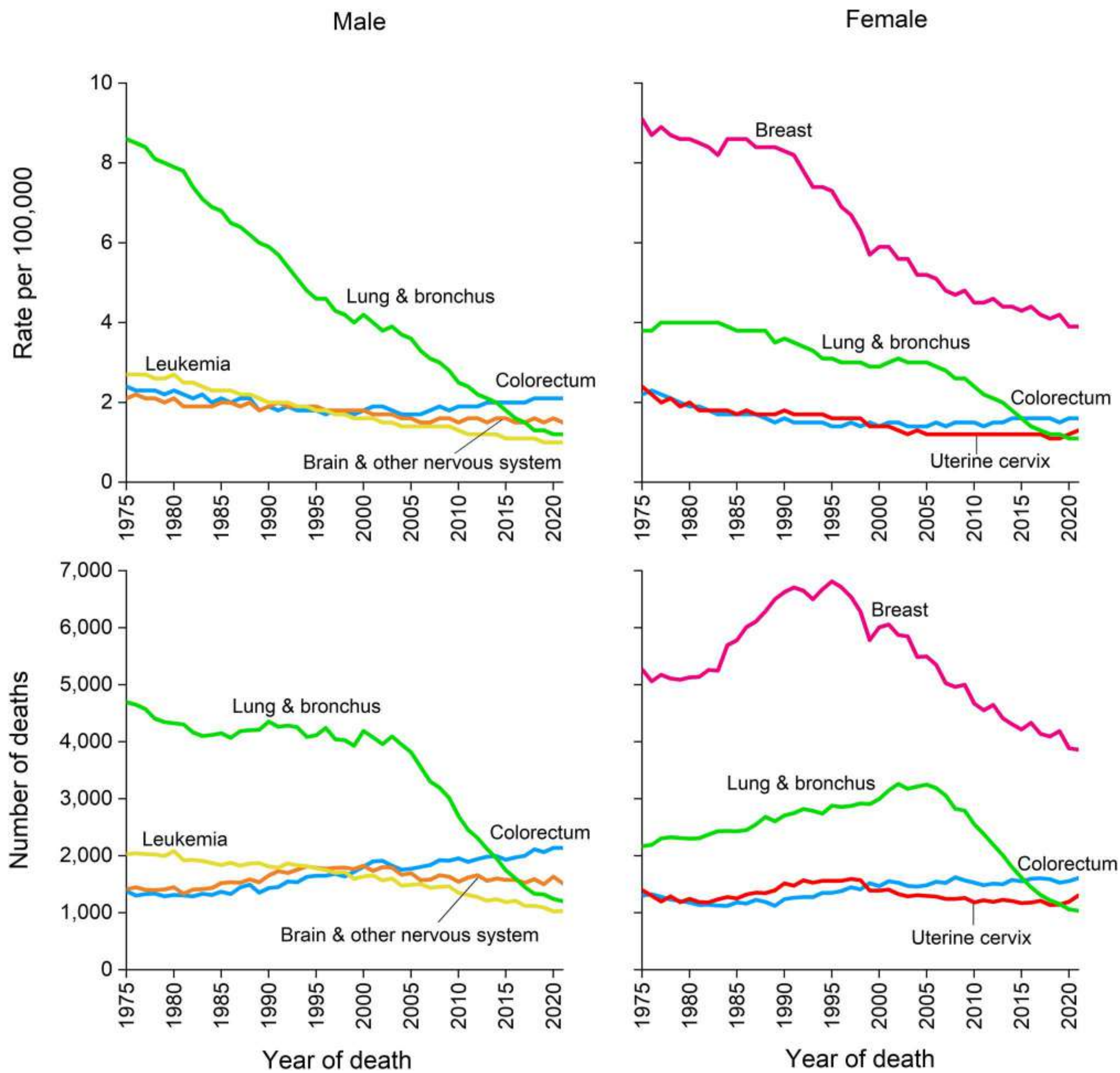

FIGURE 9 Trends in the age-standardized rate and number of deaths for the leading causes of cancer death in men and women, aged birth to 49 years, United States, 1975–2021. Rates are age adjusted to the 2000 US standard population.

to 14 years) and 5290 adolescents (aged 15–19 years) will be diagnosed with cancer, and 1040 and 550, respectively, will die from the disease. An estimated one in 257 children and adolescents will be diagnosed with cancer before age 20 years.

Leukemia is the most common childhood cancer, accounting for 28% of cases, followed by brain and other nervous system tumors (25%), nearly one third of which are benign or borderline malignant (Table 14). Cancer types and their distribution differ in adolescents, among whom the most common cancer is brain and other nervous system tumors (21%), more than one half of which are benign or borderline malignant, followed by lymphoma (19%) and leukemia (13%). In addition, there are twice as many cases of Hodgkin lymphoma as non-Hodgkin lymphoma among adolescents, whereas the reverse is true among children. Thyroid carcinoma and melanoma of the skin account for 12% and 3% of cancers, respectfully, in adolescents, but only 2% and 1%, respectively, in children.

The overall incidence rate for invasive cancer in children appears to have finally stabilized since 2016 after increasing since at least 1975. The downturn reflects stabilized leukemia incidence and declining trends for malignant brain tumors and lymphomas (Figure 10). In contrast, leukemia and lymphoma incidence rates are still slowly increasing in adolescents, alongside a steep upward trend in thyroid cancer rates of >4% per year, resulting in an overall

TABLE 9 Five leading causes of death in the United States by age and sex, 2021.

Ranking	All ages	1–19	20–39	40–59	60–79	> 80
Male						
All causes	1,838,108	15,303	113,597	302,174	809,856	568,199
1	Heart diseases	Accidents (unintentional injuries)	Accidents (unintentional injuries)	Heart diseases	Cancer	Heart diseases
	384,886	5430	46,988	55,151	183,307	148,510
2	Cancer	Assault (homicide)	Intentional self-harm (suicide)	COVID-19	Heart diseases	Cancer
	318,670	2884	13,964	48,762	174,359	89,956
3	COVID-19	Intentional self-harm (suicide)	Assault (homicide)	Accidents (unintentional injuries)	COVID-19	COVID-19
	236,610	2144	11,931	47,580	115,078	63,945
4	Accidents (unintentional injuries)	Cancer	COVID-19	Cancer	Chronic lower respiratory diseases	Cerebrovascular disease
	149,602	985	8455	40,461	37,365	32,267
5	Cerebrovascular diseases	Congenital anomalies	Heart diseases	Chronic liver disease & cirrhosis	Accidents (unintentional injuries)	Alzheimer disease
	70,852	497	6323	14,611	31,879	27,943
Female						
All causes	1,626,123	7895	49,980	180,007	603,840	775,367
1	Heart diseases	Accidents (unintentional injuries)	Accidents (unintentional injuries)	Cancer	Cancer	Heart diseases
	310,661	2695	17,228	41,209	151,651	183,609
2	Cancer	Intentional self-harm (suicide)	COVID-19	COVID-19	Heart diseases	Cancer
	286,543	806	5024	29,034	100,246	88,443
3	COVID-19	Cancer	Cancer	Heart diseases	COVID-19	Alzheimer disease
	180,283	685	4530	23,299	81,741	68,005
4	Cerebrovascular diseases	Assault (homicide)	Intentional self-harm (suicide)	Accidents (unintentional injuries)	Chronic lower respiratory diseases	COVID-19
	92,038	669	3204	18,832	36,118	64,213
5	Alzheimer disease	Congenital anomalies	Heart diseases	Chronic liver disease & cirrhosis	Cerebrovascular disease	Cerebrovascular disease
	82,424	467	3122	7708	27,295	58,607

Note: Deaths within each age group do not sum to all ages combined due to the inclusion of unknown ages and deaths occurring in individuals younger than 1 year. 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, and assault excluded legal intervention.

Abbreviation: COVID-19, coronavirus disease 2019.

Source: National Vital Statistics System, Mortality 2018–2021 on the Centers for Disease Control and Prevention WONDER Online Database, released in 2021; Centers for Disease Control and Prevention, 2021.

TABLE 10 Five leading causes of cancer death in the United States by age and sex, 2021.

Ranking	All ages	Birth to 19 years	20–39 years	40–49 years	50–64 years	65–79 years	80 years and older
Male							
All sites	318,670	1015	3927	8361	68,503	146,904	89,956
1	Lung & bronchus	Brain & ONS	Colon & rectum	Colon & rectum	Lung & bronchus	Lung & bronchus	Lung & bronchus
	71,549	292	539	1589	15,950	71,548	17,157
2	Prostate	Leukemia	Brain & ONS	Lung & bronchus	Colon & rectum	Prostate	Prostate
	32,563	257	531	1004	7866	32,563	15,794
3	Colon & rectum	Bones & joints	Leukemia	Brain & ONS	Pancreas	Pancreas	Colon & rectum
	28,370	117	422	695	6132	28,370	7043
4	Pancreas	Soft tissue[a]	Testis	Pancreas	Liver[b]	Colon & rectum	Urinary bladder
	24,912	88	230	649	4239	24,912	5821
5	Liver[b]	NHL	NHL	Esophagus	Esophagus	Liver[b]	Pancreas
	18,828	38	197	420	3559	18,827	5558
Female							
All sites	286,543	707	4530	10,488	61,321	121,051	88,443
1	Lung & bronchus	Brain & ONS	Breast	Breast	Lung & bronchus	Lung & bronchus	Lung & bronchus
	62,955	211	1076	2782	13,451	30,723	17,743
2	Breast	Leukemia	Uterine cervix	Colon & rectum	Breast	Breast	Breast
	42,310	138	506	1191	10,898	15,739	11,813
3	Colon & rectum	Bones & joints	Colon & rectum	Lung & bronchus	Colon & rectum	Pancreas	Colon & rectum
	24,361	85	415	896	5200	10,759	8990
4	Pancreas	Soft tissue[a]	Brain & ONS	Uterine cervix	Pancreas	Colon & rectum	Pancreas
	22,994	79	362	798	4386	8560	7304
5	Ovary	Kidney[c]	Leukemia	Ovary	Ovary	Ovary	Leukemia
	13,430	25	310	544	3439	6017	4048

Note: All ages includes unknown age at death. Ranking order excludes category titles that begin with the word *other*.

Abbreviations: NHL, non-Hodgkin lymphoma; ONS, other nervous system.

[a]Includes heart.

[b]Includes intrahepatic bile duct.

[c]Includes renal pelvis.

Source: National Center for Health Statistics, Centers for Disease Control and Prevention, 2023.

increase in adolescent cancer of 1% per year from 2015 through 2019. Notably, the 15-year relative survival rate for thyroid cancer diagnosed in adolescents aged 15–19 years is 99%.

In contrast, cancer mortality has declined steadily in children from 6.3 per 100,000 in 1970 to 1.9 in 2021 and in adolescents from 7.2 to 2.7 per 100,000, for overall reductions of 70% and 63%, respectively, although rates may be flattening in adolescents. Much of this progress reflects the dramatic declines in mortality for leukemia of 86% in children and 73% in adolescents. Remission rates of 90%–100% have been achieved for childhood acute lymphocytic leukemia over the past 4 decades, primarily through the optimization of established chemotherapeutic regimens as opposed to the development of new therapies.[149] However, progress among adolescents has lagged behind that in children, partly because of differences in tumor biology, clinical trial enrollment, treatment protocols, and tolerance and adherence to treatment.[150] Mortality reductions from 1970 to 2021 are also lower in adolescents for other common cancers, including brain and other nervous system tumors (41% and 35%, respectively). The 5-year relative survival rate for all cancers combined improved from 58% during the mid-1970s to 85% during 2013 through 2019 in children and from 68% to 87% in adolescents but varies substantially by cancer type and age at diagnosis (Table 14).

TABLE 11 Incidence and mortality rates for selected cancers by race and ethnicity, United States, 2016–2020.

	All races and ethnicities	White	Black	American Indian/ Alaska Native[b]	Asian American/ Pacific Islander	Hispanic/ Latino
Incidence						
All sites	453.2	474.3	459.7	478.8	301.3	358.1
Male	492.5	511.2	533.9	504.1	299.0	377.2
Female	426.6	449.3	409.9	465.5	307.3	351.3
Breast (female)	129.0	134.9	129.6	115.5	104.6	100.7
Colon & rectum[a]	35.3	35.2	40.8	50.0	28.1	32.2
Male	40.7	40.4	48.8	57.8	33.4	38.2
Female	30.6	30.5	35.0	43.7	23.7	27.2
Kidney & renal pelvis	17.6	17.8	19.3	33.0	8.2	17.9
Male	23.9	24.3	26.4	43.9	11.6	23.5
Female	12.1	12.1	13.7	23.9	5.5	13.3
Liver & intrahepatic bile duct	8.8	7.5	10.5	19.1	11.9	13.9
Male	13.2	11.2	17.0	27.3	18.4	20.4
Female	4.9	4.2	5.5	12.3	6.7	8.4
Lung & bronchus	55.0	59.5	56.7	62.2	33.6	28.3
Male	62.2	65.7	72.4	67.2	40.8	34.3
Female	49.4	54.8	45.8	58.6	28.1	24.0
Prostate	115.0	110.7	186.1	91.9	60.9	90.9
Stomach	6.3	5.1	9.7	10.1	9.0	9.3
Male	8.4	7.1	13.0	13.1	11.8	11.4
Female	4.6	3.4	7.4	7.8	6.9	7.7
Uterine cervix	7.7	7.2	8.6	11.4	6.0	9.7
Uterine corpus	27.7	27.9	28.9	30.4	21.7	25.8
Mortality						
All sites	149.8	155.0	175.8	183.8	95.4	108.6
Male	178.0	183.3	217.4	221.6	111.6	130.2
Female	129.1	133.6	150.2	157.9	83.7	93.5
Breast (female)	19.7	19.7	27.8	21.1	11.8	13.7
Colon & rectum	13.2	13.1	17.7	19.0	9.2	10.7
Male	15.7	15.5	22.4	23.1	11.0	13.6
Female	11.0	11.1	14.4	16.0	7.8	8.5
Kidney & renal pelvis	3.5	3.6	3.4	6.7	1.6	3.3
Male	5.1	5.3	5.2	9.9	2.4	4.8
Female	2.2	2.3	2.2	4.2	1.0	2.1
Liver & intrahepatic bile duct	6.6	5.9	8.3	13.6	8.5	9.3
Male	9.6	8.5	13.0	19.9	12.6	13.1
Female	4.1	3.7	4.8	8.8	5.2	6.0
Lung & bronchus	35.0	38.2	37.5	43.4	20.0	15.5
Male	42.3	44.9	51.3	52.3	25.9	21.0
Female	29.4	32.9	28.0	37.0	15.6	11.4

TABLE 11 (Continued)

	All races and ethnicities	White	Black	American Indian/ Alaska Native[b]	Asian American/ Pacific Islander	Hispanic/ Latino
Prostate	18.9	17.9	37.9	22.5	8.7	15.4
Stomach	2.9	2.1	5.0	5.6	4.7	4.8
Male	3.8	2.9	7.2	7.7	6.0	5.9
Female	2.1	1.5	3.5	4.1	3.7	3.9
Uterine cervix	2.2	2.0	3.3	3.3	1.7	2.5
Uterine corpus	5.1	4.6	9.1	4.9	3.5	4.3

Note: Rates are per 100,000 population and age adjusted to the 2000 US standard population and exclude data from Puerto Rico. Incidence data are adjusted for delays in reporting. All race groups are exclusive of Hispanic origin.

[a]Colorectal cancer incidence rates exclude appendix.

[b]To reduce racial misclassification for American Indian and Alaska Native individuals, incidence rates are limited to Preferred/Referred Care Delivery Area counties and mortality rates are for the entire United State and adjusted for misclassification using factors from the National Center for Health Statistics.

TABLE 12 Incidence rates for selected cancers by state, United States, 2016–2020.

	All sites		Breast	Colon & rectum[a]		Lung & bronchus		Non-Hodgkin lymphoma		Prostate	Uterine cervix
State	Male	Female	Female	Male	Female	Male	Female	Male	Female	Male	Female
Alabama	498.6	398.8	122.1	45.5	34.2	75.8	47.9	18.7	12.3	120.3	9.4
Alaska	444.7	405.0	122.3	42.3	36.6	57.0	48.9	21.3	14.6	99.0	7.0
Arizona	398.2	361.6	113.0	33.5	25.6	45.1	38.7	17.9	11.7	76.4	6.1
Arkansas[b]	547.9	437.7	123.2	49.1	35.9	90.5	62.1	23.3	15.0	119.1	9.2
California	419.9	379.9	120.9	36.6	28.1	41.8	34.4	21.4	14.7	95.4	7.3
Colorado	410.9	381.9	129.3	32.9	25.8	40.0	37.2	20.3	13.4	98.5	5.9
Connecticut	494.2	435.1	138.5	36.6	27.2	59.0	52.6	24.4	17.4	122.7	5.4
Delaware	500.2	427.1	134.6	38.5	27.6	62.4	52.7	21.8	14.3	125.0	7.1
District of Columbia	437.8	389.3	134.0	36.6	29.9	47.8	39.4	18.6	11.4	130.5	7.2
Florida	487.3	427.2	121.3	38.7	29.1	61.2	48.9	25.4	18.1	97.0	9.1
Georgia	527.2	418.2	129.2	44.1	31.9	70.3	48.5	21.5	14.2	134.7	8.0
Hawaii	438.9	399.4	140.2	43.3	31.3	49.6	35.2	17.8	12.4	101.1	6.9
Idaho	486.1	412.0	130.7	37.9	27.9	48.8	43.7	23.1	15.3	118.8	7.2
Illinois	496.8	436.5	132.6	44.3	32.5	66.4	54.1	22.8	15.8	115.1	7.4
Indiana[b]	503.7	436.4	126.6	45.4	34.3	80.1	61.2	22.3	15.1	104.6	8.5
Iowa	531.7	456.0	134.7	43.2	33.9	69.7	53.7	25.4	17.6	120.4	7.5
Kansas	491.4	429.2	132.4	42.3	32.5	58.4	48.2	23.1	15.4	116.4	7.8
Kentucky	554.3	475.1	126.7	51.1	36.9	97.4	74.5	23.0	16.6	108.3	9.7
Louisiana	549.7	424.5	127.5	49.9	36.0	75.4	50.6	22.2	15.6	138.1	8.8
Maine	507.1	449.9	128.1	37.4	29.4	74.3	65.5	25.4	15.3	98.3	5.9
Maryland	490.4	422.9	133.2	37.5	30.0	56.4	48.5	22.0	14.7	135.7	6.6
Massachusetts	481.5	428.8	135.8	35.4	26.6	61.9	57.5	23.0	15.4	113.2	5.2
Michigan	477.2	410.9	122.7	38.3	29.9	66.3	54.5	22.5	15.4	112.1	6.6

(Continues)

TABLE 12 (Continued)

State	All sites		Breast	Colon & rectum[a]		Lung & bronchus		Non-Hodgkin lymphoma		Prostate	Uterine cervix
	Male	Female	Female	Male	Female	Male	Female	Male	Female	Male	Female
Minnesota	510.0	448.7	136.3	38.7	29.4	59.2	51.6	27.1	17.5	113.1	5.4
Mississippi	537.1	412.5	122.3	52.7	38.0	89.1	55.3	20.3	13.1	131.4	8.9
Missouri	481.0	429.8	130.9	42.2	32.1	77.3	61.1	22.2	15.2	96.0	8.2
Montana	494.5	426.4	134.2	40.4	28.8	47.8	47.6	21.6	14.4	131.2	7.0
Nebraska	498.3	432.6	131.0	42.8	34.3	57.9	48.1	23.0	16.3	124.8	7.2
Nevada[c]	403.3	369.9	111.4	38.4	29.9	46.8	44.4	17.6	11.9	90.4	8.5
New Hampshire	510.3	452.5	138.9	36.9	28.3	63.3	59.4	24.9	17.5	114.2	4.9
New Jersey	531.0	450.2	137.1	42.3	32.3	55.9	48.3	26.0	17.5	143.4	7.4
New Mexico	385.9	359.0	113.8	36.7	27.2	37.9	30.5	16.8	12.2	85.6	8.3
New York	517.8	446.6	134.0	40.6	30.0	60.8	51.7	25.1	17.8	130.3	7.4
North Carolina	514.7	429.8	137.6	38.6	28.6	74.4	54.0	21.6	14.4	123.9	6.9
North Dakota	487.9	428.4	131.5	43.0	32.6	60.9	52.9	22.6	15.4	122.0	6.1
Ohio	506.4	438.2	129.5	43.1	32.2	74.8	57.1	23.2	15.5	114.1	7.8
Oklahoma	482.7	416.5	122.6	44.7	32.4	73.1	55.4	19.6	14.7	100.5	9.8
Oregon	436.5	409.6	128.8	35.2	27.4	51.9	47.0	21.6	14.8	94.4	6.6
Pennsylvania	503.2	445.5	130.6	41.9	31.6	67.3	53.9	23.7	16.7	108.9	7.2
Rhode Island	496.2	444.6	139.9	34.3	27.3	70.1	59.7	22.4	15.6	114.2	7.1
South Carolina	476.6	397.4	128.6	39.5	29.0	70.8	49.1	19.3	12.5	109.8	7.9
South Dakota	495.0	432.8	123.8	43.6	32.9	60.0	53.3	22.5	16.5	123.2	6.4
Tennessee	514.7	415.9	122.4	43.8	31.9	82.8	59.6	21.4	14.1	116.1	7.8
Texas	455.7	381.6	116.3	42.8	29.4	55.1	39.7	20.7	14.2	103.4	9.4
Utah	442.8	373.0	115.5	30.3	23.6	28.2	22.1	22.1	14.6	117.4	5.8
Vermont	481.2	437.7	131.9	37.4	26.3	60.9	52.7	22.9	14.9	101.9	5.3
Virginia	438.0	389.4	126.4	36.6	28.1	59.6	46.3	20.1	13.8	102.1	6.0
Washington	458.8	420.4	132.7	36.1	28.4	52.2	47.3	22.8	15.7	100.3	6.5
West Virginia	512.0	463.1	119.9	48.4	36.5	84.7	68.7	23.3	16.2	97.7	9.5
Wisconsin	507.2	435.9	134.6	37.1	28.9	63.1	52.4	25.3	16.8	118.9	6.1
Wyoming	430.6	384.8	116.1	37.0	28.7	42.1	39.5	19.1	12.9	113.7	8.8
Puerto Rico[d]	391.5	323.5	97.3	45.0	30.1	20.3	11.1	16.6	11.8	141.1	12.0
United States[e]	492.5	426.6	129.0	40.7	30.6	62.2	49.4	23.0	15.7	115.0	7.7

Note: Rates are per 100,000, age adjusted to the 2000 US standard population using 19 age groups.

[a]Colorectal cancer incidence rates exclude appendix, with the exception of Nevada.

[b]Rates for these states are based on data collected from 2016 to 2019.

[c]Rates for this state are based on data published in North American Central Cancer Registries' North America Explorer and are age adjusted to 20 age groups.

[d]Data for 2017 based on cases diagnosed January through June.

[e]Rates are adjusted for delays in reporting and exclude Puerto Rico.

TABLE 13 Mortality rates for selected cancers by state, United States, 2017–2021.

	All sites		Breast	Colorectum		Lung & bronchus		Non-Hodgkin lymphoma		Pancreas		Prostate
State	Male	Female	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
Alabama	202.9	134.8	20.6	17.8	12.0	57.1	31.6	6.6	3.2	13.6	10.1	20.0
Alaska	172.4	125.6	17.1	15.5	13.5	35.6	28.5	6.8	4.5	11.3	8.2	20.7
Arizona	154.2	114.7	18.3	14.6	10.1	30.9	23.9	5.8	3.3	11.7	8.8	17.2
Arkansas	204.7	140.3	19.7	17.7	12.3	58.3	37.6	6.9	3.9	13.4	9.3	19.1
California	156.3	117.0	18.9	14.1	10.2	28.5	20.7	6.4	3.7	11.8	9.1	19.8
Colorado	150.2	111.6	18.7	13.2	9.9	25.8	20.5	5.9	3.3	11.2	8.6	21.6
Connecticut	161.1	117.5	17.1	12.4	8.6	33.6	26.0	6.6	3.6	12.6	10.0	18.6
Delaware	185.4	132.1	21.1	14.7	10.5	43.7	30.9	7.3	3.8	14.5	10.6	18.8
District of Columbia	171.0	136.7	23.6	15.7	12.2	32.9	23.1	5.5	3.4	13.4	12.1	27.2
Florida	165.3	120.4	18.5	14.6	10.1	39.4	27.7	6.0	3.5	12.3	9.0	16.4
Georgia	183.7	129.0	20.9	16.8	11.4	46.0	28.0	6.1	3.5	12.8	9.6	21.1
Hawaii	148.3	105.2	16.1	14.3	9.5	30.6	20.7	5.9	3.6	12.3	9.2	15.2
Idaho	166.3	124.0	19.8	14.6	10.9	30.4	24.5	6.4	4.6	12.6	9.5	20.9
Illinois	180.1	133.6	20.4	16.6	11.6	42.7	30.6	6.7	3.9	13.5	10.1	19.1
Indiana	199.4	142.5	20.4	17.5	12.5	52.8	36.2	7.3	4.5	14.0	10.5	19.9
Iowa	182.0	129.7	17.9	15.8	11.2	43.7	30.7	7.4	4.2	12.3	9.6	20.0
Kansas	182.1	133.6	19.6	16.9	11.6	44.1	32.0	7.1	4.2	13.4	9.3	17.8
Kentucky	218.1	152.3	21.2	19.7	13.3	63.6	43.8	7.6	4.6	13.3	10.1	18.1
Louisiana	204.2	139.8	22.3	19.1	12.8	54.5	32.5	7.1	4.0	13.9	10.8	19.9
Maine	194.7	137.5	16.8	14.7	11.0	47.4	37.5	7.3	4.3	13.5	10.2	19.6
Maryland	171.1	126.9	20.5	15.6	11.2	37.3	27.7	6.3	3.4	13.0	9.8	19.7
Massachusetts	169.0	121.0	16.1	12.9	8.9	36.0	29.2	6.6	3.7	13.5	10.0	18.3
Michigan	188.0	138.7	20.2	16.0	11.4	46.4	34.2	7.7	4.5	14.3	10.8	18.7
Minnesota	168.3	123.6	17.4	13.8	9.7	35.1	27.7	7.8	4.1	12.7	9.6	19.8
Mississippi	224.2	148.2	23.8	21.8	14.1	64.3	35.8	6.5	3.5	14.1	10.9	25.1
Missouri	195.5	139.0	19.8	16.8	11.5	52.4	36.4	7.1	4.1	14.0	9.8	17.8
Montana	166.6	124.0	17.8	14.3	9.9	31.7	27.3	6.3	3.3	11.5	8.9	21.3
Nebraska	175.5	130.5	20.4	17.6	12.0	38.6	28.2	7.0	3.7	14.1	10.1	19.2
Nevada	168.9	130.7	21.6	16.9	12.0	35.6	30.7	6.5	3.8	12.2	9.2	19.7
New Hampshire	174.8	125.5	17.7	13.8	9.8	38.7	31.9	6.2	3.7	12.8	9.9	19.8
New Jersey	157.9	122.4	19.7	14.6	10.7	33.3	25.0	6.1	3.5	13.1	10.2	16.4
New Mexico	159.8	115.0	19.7	15.5	10.2	27.3	18.7	5.9	3.5	11.6	8.5	19.7
New York	154.0	117.9	17.8	13.6	9.9	33.6	24.6	6.1	3.5	12.5	9.6	16.2
North Carolina	185.4	131.0	20.2	14.8	10.7	48.4	31.1	6.6	3.5	12.6	9.8	19.8
North Dakota	166.2	121.4	16.8	15.5	9.9	38.4	27.8	6.3	3.6	12.7	8.9	18.5
Ohio	197.1	140.0	20.8	17.1	11.9	50.7	34.1	7.5	4.2	14.2	10.4	19.4
Oklahoma	208.6	150.0	22.6	19.3	13.6	55.6	37.9	7.7	4.5	12.8	9.6	19.9
Oregon	173.1	132.1	19.0	14.0	10.4	35.1	30.0	7.1	4.4	12.8	10.2	20.2
Pennsylvania	184.9	133.4	19.9	16.1	11.2	43.2	30.0	7.3	4.2	14.0	10.3	18.4

(Continues)

TABLE 13 (Continued)

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
Rhode Island	178.1	126.8	16.6	12.0	10.4	40.4	31.4	6.9	3.8	14.1	9.1	18.4
South Carolina	191.3	131.1	21.0	16.6	10.8	49.0	30.2	6.2	3.6	13.5	9.8	20.8
South Dakota	179.3	132.2	18.3	16.2	12.1	40.2	31.7	7.4	4.5	12.9	9.9	19.0
Tennessee	203.5	141.5	21.5	17.9	11.9	55.9	36.8	7.2	4.0	13.0	10.0	19.4
Texas	172.0	122.5	19.7	17.0	11.0	37.3	24.6	6.6	3.7	12.0	9.1	17.8
Utah	138.5	105.9	20.0	11.3	9.4	18.8	13.9	6.5	3.4	11.1	8.0	21.7
Vermont	184.1	131.1	17.0	15.6	11.2	38.9	29.8	7.2	3.5	12.7	10.6	21.8
Virginia	177.6	127.5	20.6	15.5	10.9	42.2	28.3	6.7	3.7	13.1	9.8	19.9
Washington	168.7	127.2	19.2	14.0	10.0	34.5	27.7	6.9	4.2	12.4	10.1	20.1
West Virginia	211.2	151.9	21.2	20.2	13.3	58.9	41.1	7.8	4.3	13.2	9.7	17.5
Wisconsin	178.4	128.5	17.9	13.9	10.1	39.1	30.2	7.4	4.2	13.8	10.1	20.8
Wyoming	161.2	125.7	19.0	14.4	11.4	31.6	27.7	6.6	3.8	12.7	8.9	18.5
Puerto Rico[a]	132.1	86.4	17.0	17.7	10.7	14.8	7.2	4.3	2.6	7.9	5.2	21.4
United States	175.0	127.4	19.5	15.5	10.9	40.4	28.4	6.6	3.8	12.8	9.7	18.8

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

[a]Rates for Puerto Rico for 2016–2020 and are not included in US combined rates.

TABLE 14 Incidence rates, case distribution, and 5-year relative survival by age and International Classification of Childhood Cancer (ICCC) type, ages birth to 19 years, United States.[a]

	Birth to 14 years			15–19 years		
	Incidence rate per million[b]	Distribution, %	Survival,[c] %	Incidence rate per million[b]	Distribution, %	Survival,[c] %
All ICCC groups combined (malignant only)	170.6	92	85	238.3	86	87
Leukemias, myeloproliferative & myelodysplastic diseases	52.8	28	88	35.2	13	77
Lymphoid leukemia	40.3	22	92	18.4	7	76
Acute myeloid leukemia	7.6	4	68	8.8	3	71
Lymphomas and reticuloendothelial neoplasms	21.5	12	95	52.4	19	94
Hodgkin lymphoma	5.7	3	98	31.6	11	98
Non-Hodgkin lymphoma (including Burkitt)	10.1	5	91	18.3	7	88
Central nervous system neoplasms	47.1	25	75	60.1	22	77
Benign/borderline malignant tumors	15.3	8	98	39.1	14	99
Neuroblastoma & other peripheral nervous cell tumors	11.4	6	82	1.1	<1	82[d]
Retinoblastoma	4.0	2	96	<0.1	<1	–[e]
Nephroblastoma & other nonepithelial renal tumors	8.0	4	93	0.3	<1	–[e]
Hepatic tumors	3.1	2	80	1.4	<1	56[d]
Hepatoblastoma	2.7	1	82	<0.1	<1	–[e]
Malignant bone tumors	7.6	4	73	14.8	5	70
Osteosarcoma	4.3	2	66	8.1	3	65
Ewing tumor & related bone sarcomas	2.6	1	81	4.6	2	68

TABLE 14 (Continued)

	Birth to 14 years			15–19 years		
	Incidence rate per million[b]	Distribution, %	Survival,[c] %	Incidence rate per million[b]	Distribution, %	Survival,[c] %
Rhabdomyosarcoma	5.2	3	67	3.8	1	54
Germ cell & gonadal tumors	5.7	3	93	26.5	10	94
Thyroid carcinoma	3.6	2	99	33.1	12	>99
Malignant melanoma	1.6	1	94	8.2	3	97

Note: Incidence rates are per 1,000,000 population and age-adjusted to the US standard population. Survival rates are adjusted for normal life expectancy and are based on follow-up of patients through 2020.

[a]Benign and borderline brain tumors were excluded from survival calculations for all central nervous system tumors combined but were included in central nervous system tumor incidence rates and denominators for case distribution.

[b]Incidence rates are based on diagnoses during 2016–2020 and age-adjusted to the US standard population.

[c]Survival rates are adjusted for normal life expectancy and are based on diagnoses during 2013–2019 and follow-up of all patients through 2020.

[d]The standard error of the survival rate is between 5 and 10 percentage points.

[e]Statistic could not be calculated due to fewer than 25 cases during 2013–2019.

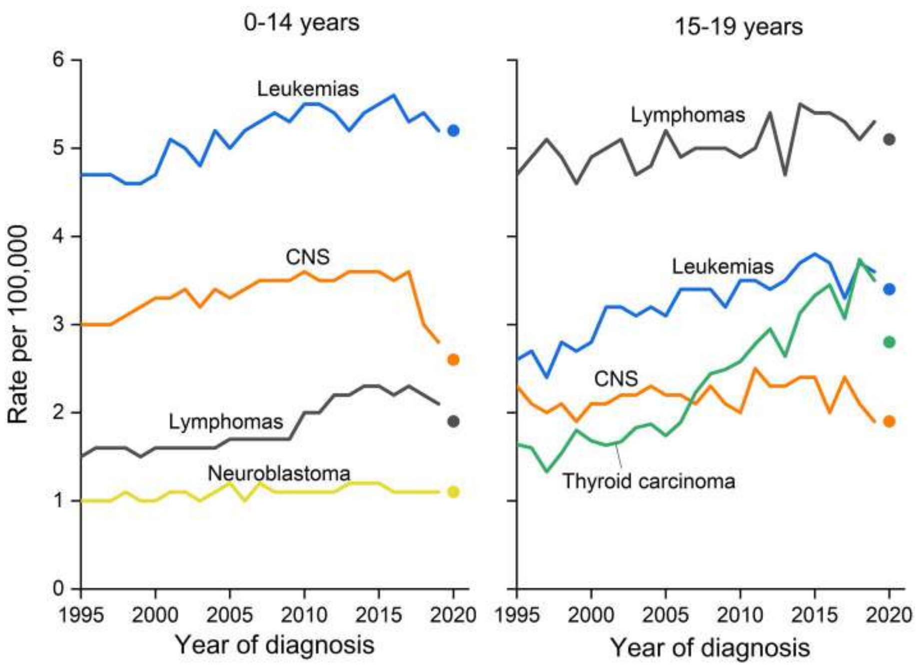

FIGURE 10 Trends in incidence rates for the four leading cancer types among children and adolescents, United States, 1995–2020. Rates are age adjusted to the 2000 US standard population. Leukemias include myeloproliferative and myelodysplastic disease. CNS includes miscellaneous intracranial and intraspinal neoplasms. Neuroblastoma includes other peripheral nervous cell tumors. Incidence data for 2020 are shown separate from trend line. CNS indicates central nervous system.

LIMITATIONS

The estimated numbers of new cancer cases and deaths in 2024 provide a reasonably accurate portrayal of the contemporary cancer burden. However, they are model-based, 3-year (mortality) or 4-year (incidence) projections that should not be used to track trends over time because of several limitations. First, new methodologies are adopted regularly, most recently in 2021,[25,26] to take advantage of improved modeling techniques and cancer surveillance coverage. Second, although the models are robust, they can only account for trends through the most recent data year (currently, 2020 for incidence and 2021 for mortality) and thus cannot anticipate abrupt fluctuations caused by changes in detection practice, such as those that occur for prostate cancer because of changes in PSA testing. Third, the model can be oversensitive to sudden or steep changes in observed data. The most informative metrics for tracking cancer trends are age-standardized or age-specific cancer incidence rates from SEER, NPCR, and/or NAACCR and cancer death rates from the NCHS.

Errors in reporting race and ethnicity in medical records and on death certificates result in underestimated cancer incidence and mortality in persons who are not White, particularly Native American populations. Although racial misclassification in mortality data among Native Americans is somewhat mitigated because of newly available adjustment factors published by researchers at the NCHS, these are currently for all cancers combined and not available for individual cancer sites.[22] It is also important to note that cancer data in the United States are primarily reported for broad, heterogeneous racial and ethnic groups, masking important differences in the cancer burden within these populations. For example, although lung cancer incidence is approximately 50% lower in AAPI men than in White men overall, it is equivalent in Native Hawaiian men, who are classified within this broad category.[151] Finally, the lack of sexual orientation and gender identity data collection precludes analysis of cancer occurrence in the LGBTQ+ population, which undoubtedly would inform targeted cancer-control efforts given the high prevalence of smoking in this group.[152]

CONCLUSION

Cancer mortality continued to decline in the United States through 2021, resulting in an overall drop of 33% since 1991 because of reductions in smoking, earlier detection for some cancers, and improved treatment, including recent developments in targeted therapies and immunotherapy. However, progress is lagging in cancer prevention, as incidence continues to increase for 6 of the top 10 cancers, including breast, prostate, uterine corpus, pancreas, oropharynx, liver (female), kidney, and melanoma, as well as CRC and cervical cancer in young adults. Among adults younger than 50 years, CRC is now the leading cause of cancer death in men and the second-leading cause in women (behind breast cancer), despite ranking fourth in 1998. Additionally, cancer patients are increasingly shifting from older to middle-aged individuals who have many more years of life expectancy, and thus, opportunity to experience the late effects of treatment, including subsequent cancers. Progress is also stagnant in reducing cancer disparities, especially among Black women, who have mortality rates 40% higher for breast cancer and two times higher for uterine corpus cancer despite similar incidence. Further, it is no coincidence that AIAN men and women have the highest cancer incidence and mortality as well as the highest poverty rate compared to other racial and ethnic groups. A small but promising step toward addressing this issue is the Persistent Poverty Initiative, which was recently funded with $50 million to address the impact of poverty on cancer outcomes in communities where ≥20% of residents have lived below the federal poverty line for at least 30 years.[153] Overall progress against cancer could be accelerated by increasing investment in cancer prevention and mitigating cancer disparities through expanded access to high-quality care, especially among AIAN and Black individuals.

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CONFLICT OF INTEREST STATEMENT

The authors declared no conflicts of interest.

ORCID

Rebecca L. Siegel https://orcid.org/0000-0001-5247-8522
Angela N. Giaquinto https://orcid.org/0000-0003-2548-9693

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