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Counts, incidence rates, and trends of pediatric cancer in the United States, 2003–2019

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Abstract

Background: Cancer is a leading cause of death by disease among children and adolescents in the United States. This study updates cancer incidence rates and trends using the most recent and comprehensive US cancer registry data available.

Methods: We used data from US Cancer Statistics to evaluate counts, age-adjusted incidence rates, and trends among children and adolescents younger than 20years of age diagnosed with malignant tumors between 2003 and 2019. We calculated the average annual percent change (APC) and APC using joinpoint regression. Rates and trends were stratified by demographic and geographic characteristics and by cancer type.

Results: With 248749 cases reported between 2003 and 2019, the overall cancer incidence rate was 178.3 per 1 million; incidence rates were highest for leukemia (46.6), central nervous system neoplasms (30.8), and lymphoma (27.3). Rates were highest for males, children 0 to 4years of age, Non-Hispanic White children and adolescents, those in the Northeast census region, the top 25% of counties by economic status, and metropolitan counties with a population of 1 million people or

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Conflicts of interest

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more. Although the overall incidence rate of pediatric cancer increased 0.5% per year on average between 2003 and 2019, the rate increased between 2003 and 2016 (APC = 1.1%), and then decreased between 2016 and 2019 (APC = −2.1%). Between 2003 and 2019, rates of leukemia, lymphoma, hepatic tumors, bone tumors, and thyroid carcinomas increased, while melanoma rates decreased. Rates of central nervous system neoplasms increased until 2017, and then decreased. Rates of other cancer types remained stable.

Conclusions: Incidence of pediatric cancer increased overall, although increases were limited to certain cancer types. These findings may guide future public health and research priorities.

Approximately 15000 children and adolescents are diagnosed with cancer each year in the United States (1). Although pediatric cancer mortality has decreased over the past 40years (2), cancer is still the leading disease-related cause of death among children and adolescents aged 1 to 19years in the United States (3,4). The number of pediatric cancer survivors in the United States is growing and was estimated at 483039 as of 2018 (5). Changes in pediatric cancer incidence rates may indicate shifts in clinical care or research needs both for patients and for survivors.

Past studies documented either stable or increasing rates of pediatric cancer in the United States (6,7) or trends that varied by cancer type (8–11). Many of these studies used older data or Surveillance, Epidemiology, and End Results (SEER) data, however, which covered 28% or less of the US population (2,7,12). US Cancer Statistics (USCS) combines data from the US Centers for Disease Control and Prevention's National Program of Cancer Registries (NPCR) and the National Cancer Institute's SEER program. USCS covers all 50 US states and the District of Columbia and can be used to assess recent pediatric cancer trends overall, by demographic group, and by cancer type. Because pediatric cancer incidence varies geographically in the United States (13–15), studies using high population coverage can account for regional differences in incidence and trends. This study describes overall counts, rates, and trends of pediatric cancer in the United States diagnosed from 2003 to 2019 by demographic group, geographic characteristic, and cancer type.

Methods

Data were obtained from the USCS analytic database (16). Population-based cancer registries that contribute to NPCR and SEER collected cases through medical record abstraction performed by cancer registrars. In our study, pediatric cancer included children (aged between 0–14years) and adolescents (aged 15–19 years) who were diagnosed with a first primary malignant cancer, defined by behavior code = 3 [including pilocytic astrocytoma, as has been noted previously (17,18)] in the United States from 2003 to 2019. Data met USCS publication criteria during the study period (19,20); data from Nevada were excluded from the entire study because they did not meet publication criteria during the 2018–2019 period. The final dataset covered 99.1% of the US population. We characterized diagnoses by site and histology according to the rules and nomenclature of the *International Classification of Diseases for Oncology*, Third Edition (21,22) and grouped them according to the International Classification of Childhood Cancer (ICCC) (23,24). We used the USCS "race and origin recode" variable to define race and ethnicity and categorized results as Non-Hispanic American Indian or Alaska Native, Non-Hispanic Asian or Pacific Islander,

Non-Hispanic Black (Black), Non-Hispanic White (White), and Hispanic or Latino (any race) (Hispanic). We analyzed economic status by county of residence at diagnosis and stratified by percentile, as defined by the Appalachian Regional Commission (25) but did not include data from Kansas and Minnesota because county-level data were not reported from those states. Rural-urban status was described by metropolitan and nonmetropolitan areas by population size using Beale codes (26).

Statistical analysis

Rates, which were reported per 1 million people, were calculated using SEER*Stat, version 8.4.0, software and age-adjusted to the 2000 US standard population (19 age groups—Census P25–1130). Incidence rate ratios (IRRs) and 95% confidence intervals (CIs) were calculated based on reported sex using SEER*Stat software because of well-described differences in the incidence of pediatric cancer by sex. Two-sided, statistically significant IRRs were different at $P < .05$. Incidence trends were assessed using average annual percent change (AAPC) to describe a fixed interval and annual percent change (APC) to describe a single segment (6), calculated by Joinpoint, version 4.9.0.1, software; APC calculations allowed a maximum of 3 joinpoints. Two-sided statistically significant AAPC and APC were different from zero at $P < .05$. Statistically significant trends were described as increasing or decreasing; otherwise, trends were described as stable. Rates and trends were calculated overall and by sex, age, race and ethnicity, US Census region, economic status by county, rural-urban status, and cancer type (ICCC group). Rates and counts were suppressed for counts of fewer than 6 cases, and trends were calculated only if there were 6 or more cases in each calendar year during 2003 to 2019. Institutional review board review was not needed because this was a secondary analysis of deidentified data.

Results

From 2003 to 2019, 248749 cases of pediatric cancer were reported in the United States, which represented an overall age-adjusted incidence rate of 178.3 cases per million (Table 1). Rates were higher for males (185.9) than for females (170.5), and rates were highest for infants (264.6) and children aged 0 to 4years (230.7), followed by adolescents aged 15 to 19years (221.1). Rates were highest for White children and adolescents (188.9) and lowest for Black children and adolescents (136.1). By US Census region, rates were highest in the Northeast (192.4) and lowest in the South (173.6). Rates were highest in the top 25% of counties by economic status (186.1) and were highest in metropolitan areas with populations of 1 million people or more (182.1).

The absolute count of pediatric cancers increased from 13327 in 2003 to 14381 in 2019, with a peak count of 15624 cases in 2015 (Figure 1). Overall, pediatric cancer incidence rates increased from 2003 to 2019 (AAPC = 0.5%, 95% CI = 0.1 to 0.8) (Table 1). Rates increased for females, those 10 to 14 years of age and 15 to 19years of age, American Indian or Alaska Native and Hispanic race and ethnicity groups, the South and West US Census regions, the top 75% of counties by economic status, and metropolitan areas with population of 1 million people or more or fewer than 250000 people. From 2003 to 2019, overall rates increased until 2016 (APC = 1.1, 95% CI = 0.9 to 1.3), and then decreased

(APC = −2.1%, 95% CI = −3.8 to −0.3). All study characteristics had an increase starting in 2003, with a first segment APC lasting at least 13years; some study characteristics then had a second APC showing a decrease (eg, males; those 0–4 years of age and those 5–9years of age) or stable trends (eg, females; those aged 10–14years). Incidence rates for those aged 15 to 19years increased during the entire study period (AAPC = 0.8%, 95% CI = 0.5 to 1.1). Although those 0 to 4years of age had a higher rate than those in older age groups during the 2003–2019 period overall, the annual incidence rate for adolescents aged 15 to 19years surpassed that of children 0 to 4years of age in 2017 and subsequent years.

The ICCC group leukemias, myeloproliferative diseases, and myelodysplastic diseases had the highest rate (46.6), followed by central nervous system (CNS) neoplasms (30.8) and lymphomas and reticuloendothelial neoplasms (27.3) (Table 2). Compared with females, incidence rates for several cancer types (eg, leukemias, CNS neoplasms, lymphoma) were significantly higher for males. The highest male-to-female IRR was for Burkitt lymphoma (3.91), and the lowest were for gonadal carcinoma (0.08) and thyroid carcinoma (0.22).

The highest rates of leukemia and CNS neoplasms were among children 0 to 4years of age, and the highest rate of lymphoma was among adolescents (Figure 2). Some cancers were predominantly seen among children aged 0 to 4years (eg, retinoblastoma and neuroblastoma) and some among children aged 10 to 14years and adolescents (eg, thyroid carcinoma and malignant melanoma). By race and ethnicity, the rate for leukemia was highest among Hispanic children and adolescents (57.9), and the rates of lymphoma and CNS neoplasms were highest among White children and adolescents (29.2 and 35.1, respectively) (Table 3).

Increasing AAPCs were observed for 5 of the 12 ICCC categories: leukemias, lymphomas, hepatic tumors, malignant bone tumors, and other malignant neoplasms and melanoma. Rates for CNS neoplasms decreased overall during the study period (Table 2) but increased until 2017 (APC = 0.5%, 95% CI = 0.1 to 0.9), and then decreased (APC = −15.6%, 95% CI = −23.1 to −7.4) (data not shown). Within ICCC group XI (other malignant neoplasms and melanomas), rates increased for thyroid carcinoma (AAPC = 4.2%, 95% CI = 3.6 to 4.9) and decreased for melanomas (AAPC = −4.1%, 95% CI = −4.9 to −3.3).

Comparing trends in incidence rates by cancer type for males and females, lymphoma increased in males but not in females, whereas leukemia increased in females but not in males (Table 2 and Figure 3). By race and ethnicity, White children and adolescents were the only group to have increases in neuroblastoma and bone tumors and decreases in germ cell tumors, and Black children and adolescents were the only group to have decreases in retinoblastoma (Table 3 and Figure 4). Comparing trends in cancer incidence rates by age, among other findings, increases were seen in leukemia among those aged 5 to 19years and lymphoma among those aged younger than 1 year and 10 to 19years and decreases were seen in CNS neoplasms among children aged 0 to 4 years and those 5 to 9 years of age. Bone tumor rates increased among children aged 10 to 14years (Table 4).

Discussion

Approximately 15000 new cases of pediatric cancer per year were reported for the period 2003 to 2019. Across this time frame, the 3 most common pediatric cancers were leukemia, CNS neoplasms, and lymphoma. Overall, we observed an increase in the counts and incidence rates of pediatric cancer from 2003 to 2019, but trend analysis showed an increase until 2016, followed by a decrease. Cancer types where rates increased overall included leukemia, lymphoma, hepatic tumors, bone tumors, and thyroid carcinoma, whereas rates decreased for melanoma. CNS neoplasm rates increased until 2017, followed by a decrease. Some of these increases and subsequent decreases could stem from patterns or changes in coding, diagnosis, and reporting of pediatric cancer. For some cancer types, further investigation is needed to better understand factors that may affect increases and decreases in trends.

We observed that 1054 more cases were reported in 2019 than in 2003, while the US population of those younger than 20years of age increased by approximately 750 000 during that same time period (27). Past studies noted increasing rates of cancer among children younger than 15years of age, such as from 2001 to 2017 in the United States (6) and between 1992 and 2010 in Canada (28), and an increasing trend for adolescents between 2007 and 2016 (29). The reasons for increasing rates of pediatric cancer overall are likely multifactorial. First, overall rates of cancer may have increased because of changes in cancer reporting over the past 2 decades, such as the increased use of electronic pathology reporting to cancer registries. Coding changes may account for some changes in trends in pediatric cancer, such as a 2008 World Health Organization redefinition of hemopoietic cancer codes (30), which may explain increases in pediatric lymphoma group II(d) (eg, changes in Langerhans cell histiocytosis coding likely affected trends among infants and older ages). Some increases or decreases in pediatric cancer rates could be secondary to changing trends in cancer risk factors related to preconception and pregnancy (eg, smoking, assisted reproductive technology), birth (eg, increasing maternal age, low birth weight), or childhood and adolescent life (eg, infection exposure, residential chemicals, radiation exposure, use of sunscreen) (31–34). Decreases in some risk factors [eg, decreases in US adult smoking trends (35)] may reduce risk for some cancers, whereas increases in other risk factors [eg, increasing maternal age (36)] may elevate risk for others. Decreasing incidence trends in the later years of this study may have resulted from reporting delays of recently diagnosed cases, which could lead to underestimating incidence in recent years (37).

The highest rates of pediatric cancer were among those aged 0 to 4 years and those 15 to 19years, which is consistent with previous findings (13). Infants, a group that included cases diagnosed in utero, had a higher rate of cancer than other age groups in this study and a higher rate in this study than in previous data (38). For infants, the cancers with the highest incidence rates were neuroblastoma (59.3), leukemia (50.6), and CNS neoplasms (34.0), all of which had stable trends, although rates decreased for lymphoid leukemias. Increasing trends of cancer among adolescents in our study are consistent with previous data showing increases in this age group as well as in young adults aged 20 to 29 and 30 to 39years (29). For adolescents, the most common ICCC cancer types were lymphoma (50.7), leukemia (32.3), germ cell tumors (27.4), thyroid carcinoma (25.9), and CNS neoplasms (21.6);

of these, incidence rates for lymphoma, leukemia, and thyroid carcinoma increased, and rates for germ cell tumors and CNS neoplasms were stable. The reasons underlying these increases are likely multifactorial and could be related to changes in diagnosis and detection as well as to potential risk factors, including diet, obesity, and environmental exposures (39). Because clinical trial enrollment is lower among adolescents than among children because of barriers such as less frequent referrals and limited trial availability (40–42), increasing trends in this age group accentuate the importance of better understanding diagnosis patterns to improve clinical trial enrollment.

This study confirms past reports of pediatric cancer rates being highest in the Northeast compared with other US Census regions (13,14). Cancer among adults is highest in the Northeast, as well (43); regional variation in cancer could be related to demographic differences, differences in carcinogenic exposures, population-level genetic differences, or differences in access to care or cancer detection (13,14). Although the incidence rate of pediatric cancer overall was highest in the top 25% of counties by economic status, the association between socioeconomic status (SES) and pediatric cancer incidence has not been reported consistently, and definitions of SES may differ among studies; pediatric cancer incidence studies investigating potential associations between SES and race and ethnicity categories have produced varying results (14,44–48). In addition, detection bias for cancer based on SES may be possible (14). Differences in cancer incidence by rural-urban status have been described for some adult and pediatric cancers; researchers have investigated possible associations between SES status and exposures such as air pollution (10,49–51).

When evaluating the incidence of pediatric cancer by sex, rates were higher for males than for females (IRR = 1.09, 95% CI = 1.08 to 1.10), which was slightly lower than SEER data reported through 2015 (IRR = 1.19) (52). The male-to-female IRR for acute myeloid leukemia (1.02, 95% CI = 0.99 to 1.06) was lower than described in previous data; Williams et al. described male predominance of this cancer type (52). Male predominance of some cancer types may be the result of a combination of genetic, hormone-related, and immune-related mechanisms (52).

Cancer rates were highest among White children and adolescents, as has been reported previously (2,13,14). Differences in pediatric cancer incidence by race and ethnicity differed by cancer type. For example, leukemia was highest among Hispanic and lowest among Black children and adolescents, and lymphoma and CNS neoplasms were highest among White children and adolescents. Racial and ethnic disparities in pediatric cancer incidence have been reported previously across many different cancer types (47,48,53,54). Researchers have investigated differences in incidence by race and ethnicity through genome-wide association studies and investigations into epigenetics, gene-environment interactions, and exposures (31,48,54). For instance, researchers using genome-wide association studies have indicated greater frequency of pediatric cancer risk alleles among some ancestry groups (31,55).

By cancer type, increasing rates of leukemia (10), hepatic cancer (56,57), and thyroid cancer (58,59) and decreasing rates of melanoma (60,61) have been observed previously. Leukemia continues to be the most common pediatric cancer in the United States, and rates increased

overall, for females, and for lymphoid leukemias; acute myeloid leukemia was stable. This study found stable rates of kidney tumors, which were previously found to be increasing, and increasing rates of bone tumors, which were previously noted to be stable between 2001 and 2009 (7). Some have hypothesized that the increasing rate of hepatoblastoma may be the result of the increasing number of children living with congenital anomalies, which appears to be an important risk factor for this malignancy (62). Increases in Ewing sarcoma, reported here and previously, may be the result of diagnostic changes, demographic changes, or changes related to specific risk factors (63). Increased detection may account, in part, for increases in incidence, such as for thyroid carcinoma. Increasing incidence of thyroid carcinoma may be a result of both overdiagnosis and true incidence increases secondary to other causes, such as environmental exposures (eg, ionizing radiation) (58,59). Decreases in melanoma could be related to reduced ultraviolet light exposure, possibly secondary to public health interventions such as increased sun protection during younger years (60,61,64).

This study found that pediatric CNS neoplasms decreased between 2003 and 2019, but rates increased until 2017, and then decreased. Past studies reported conflicting results for pediatric brain tumor trends, depending on the percentage population coverage, years included, and granularity of CNS neoplasm subtype studied (65–67). For CNS neoplasms, advances in radiologic imaging and biomarkers and molecular diagnosis may have led to increases of some subtypes (17,66). Decreases in pediatric CNS neoplasms in 2018 and 2019 are difficult to interpret and may reflect changes related to diagnosis and reporting. In addition, this decrease could represent late reporting of some CNS neoplasms (18), which could lead to underestimates in the most recent years of the study. Independent of diagnosis and reporting, established risk factors for pediatric CNS neoplasms include ionizing radiation and rare genetic syndromes; additional factors are being studied (68,69).

The strength of this study is its use of high-quality cancer registry data covering 99.1% of the US population during 2003 to 2019. This strength must be considered in the light of certain limitations, however. First, because this study did not use delay-adjusted data, it may underestimate rates of late-reported cancers, such as melanoma and CNS neoplasms, in later years of the study. Although delayed reporting to central cancer registries has improved over time (70), it is possible that data submissions to NPCR and SEER in 2020 and 2021, which included the first mostly complete reporting of cases diagnosed in 2018 and 2019, respectively, could have a higher proportion of late-reported cases or late completion of certain variables because of logistical challenges in reporting during the COVID-19 pandemic. Although a study of the National Cancer Database described no change in registrars' ability to abstract same-year data in 2020 (71), delayed reporting of previous-year data was not evaluated. Second, our study did not include Nevada and did not include Kansas and Minnesota for economic status analysis. Third, although these data are considered high quality (no more than 5% of cases were missing information about race every year), this dataset did not include information about race for some cases; was not able to describe multiple races for individuals who reported more than 1 race; and was not restricted to Purchase/Referred Care Delivery Area counties that link with Indian Health Service data, meaning that rates in American Indian or Alaska Native populations could be underestimated (72). In addition, this study included only tumors with a malignant behavior code, meaning that nonmalignant brain tumors, which represent an annual incidence rate of

23 to 27 cases per million for children and adolescents (17,18), were not represented in rate and trend analyses; data about nonmalignant tumors are presented elsewhere (14,17,18,73).

Incidence count and rate changes of pediatric cancer are relevant to care capacity (eg, providers available, hospital space) related to cancer treatment, clinical trial enrollment, and long-term care needs. Increasing case counts of pediatric cancer, coupled with decreasing death rates and increasing survival (74), signify increasing numbers of survivors of childhood cancer in the United States. Survivors of childhood cancer often face long-term complications, including heart disease, infertility, and secondary cancers (2); many need continued follow-up as children, adolescents, and into adulthood (75). Continued surveillance can help guide potential interventions to improve treatment and survivor care and can help guide national measures to share pediatric cancer data, such as clinical and molecular data, that can be useful in research efforts and in developing interventions to increase clinical trial enrollment (76).

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The findings and conclusions are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Data availability

The data that support the findings of this study are available on request by contacting uscsdata@cdc.gov. The data are not publicly available because of privacy and legal restrictions. Information about accessing public use US Cancer Statistics can be found at https://www.cdc.gov/cancer/uscs/.

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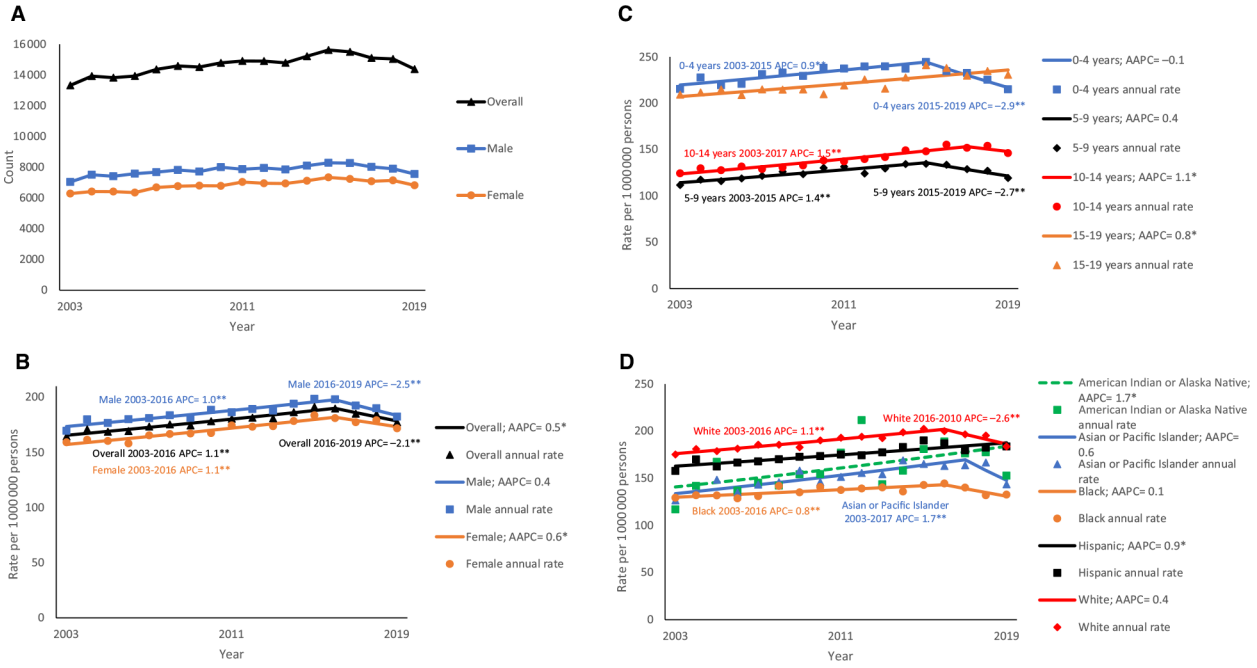

Figure 1.

Counts and trends of invasive cancer, patients aged 0 to 19years, and AAPC, overall, by sex, and by age—United States, 2003–2019. **A)** Counts overall and by sex, (**B**) rates overall and by sex, (**C**) rates by age, and (**D**) rates by race and ethnicity. Source: US Cancer Statistics. Rates are per 1 million people. Rates for patients younger than 1year of age, 5–9years of age, 10–14years of age, and 15–19years of age are age specific, and the rates for those aged 0 to 4years and 0 to 19years are age adjusted to the 2000 US standard population (19 age groups—US Census P25–1130). Cases included all malignant cancers. Incidence data are compiled from cancer registries that meet the data quality criteria for all years, 2003–2019 (covering 99.1% of the US population). Race and ethnicity were classified as Non-Hispanic American Indian or Alaska Native, Non-Hispanic Asian or Pacific Islander, Non-Hispanic Black (Black), Non-Hispanic White (White), and Hispanic or Latino (any race) (Hispanic). Registry-specific data quality information is available at https://www.cdc.gov/cancer/uscs/technical_notes/criteria/index.htm. Trends were estimated using joinpoint regression and measured with APC or AAPC and were considered to increase or decrease if $P < .05$ (2-sided); otherwise, trends were considered stable. *Indicates significant AAPC at $P < .05$. **Indicates significant APC at $P < .05$. Nonsignificant APC is not described in text in the figure. In panel **A**, markers depict observed counts; in panels **B, C,** and **D, markers** depict observed rates, and **lines** represent fitted rates calculated by joinpoint regression. AAPC = average annual percent change; APC = annual percent change.

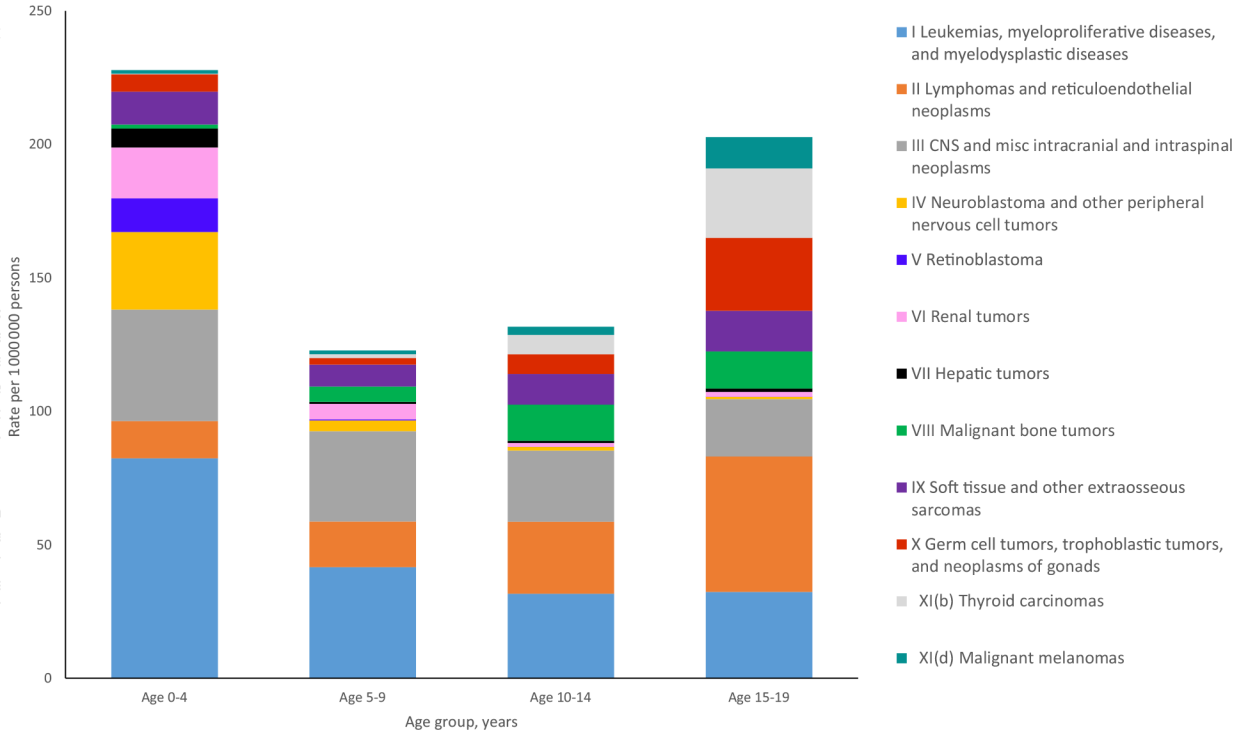

Figure 2.

Rates of invasive cancer in patients aged 0 to 19years, by ICCC group and age—United States, 2003–2019. Source: US Cancer Statistics. Rates are per 1 million people and age adjusted to the 2000 US standard population (19 age groups—US Census P25–1130). Cases included all malignant cancers. Incidence data are compiled from cancer registries that meet the data quality criteria for all years 2003–2019 (covering 99.1% of the US population). Registry-specific data quality information is available at https://www.cdc.gov/cancer/uscs/technical_notes/criteria/index.htm. CNS = central nervous system; ICCC = International Classification of Childhood Cancer.

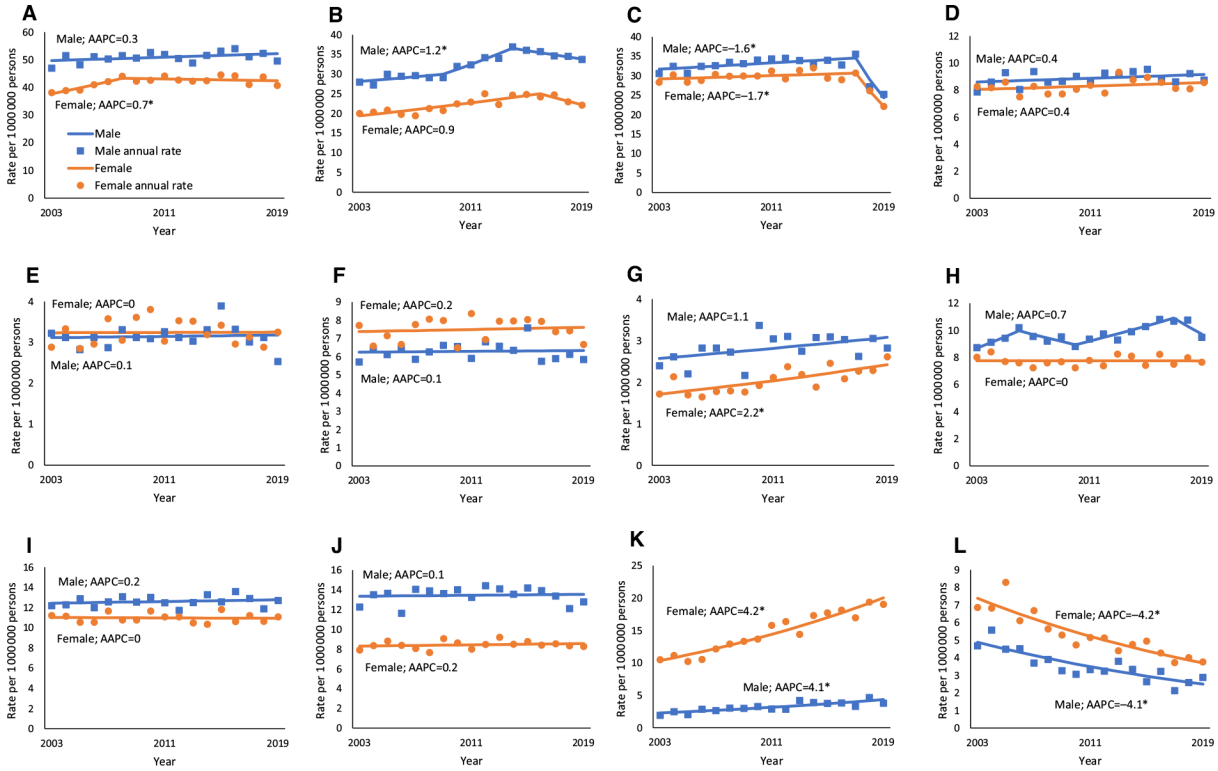

Figure 3.

Trends of pediatric cancer incidence by ICCC group and sex for patients aged 0 to 19years—United States, 2003–2019. **A**) I Leukemia, (**B**) II Lymphoma, (**C**) III CNS neoplasms, (**D**) IV Neuroblastoma, (**E**) V Retinoblastoma, (**F**) VI Renal, (**G**) VII Hepatic, (**H**) VIII Bone tumors, (**I**) IX Soft tissue sarcoma, (**J**) X germ cell, (**K**) XI(b) Thyroid, and (**L**) XI(d) Melanoma. Source: US Cancer Statistics. Rates are per 1 million people and age adjusted to the 2000 US standard population (19 age groups—US Census P25–1130). Cases included all malignant cancers. Incidence data are compiled from cancer registries that meet the data quality criteria for all years, 2003–2019 (covering 99.1% of the US population). Registry-specific data quality information is available at https://www.cdc.gov/cancer/uscs/technical_notes/criteria/index.htm. Trends were estimated using joinpoint regression and measured with AAPC; they were considered to increase or decrease if $P < .05$ (2-sided); otherwise, trends were considered stable. *Indicates significant AAPC at $P < .05$. **Markers** depict observed rates, and **lines** represent fitted rates calculated by joinpoint regression. AAPC = average annual percent change; CNS = central nervous system; ICCC = International Classification of Childhood Cancer.

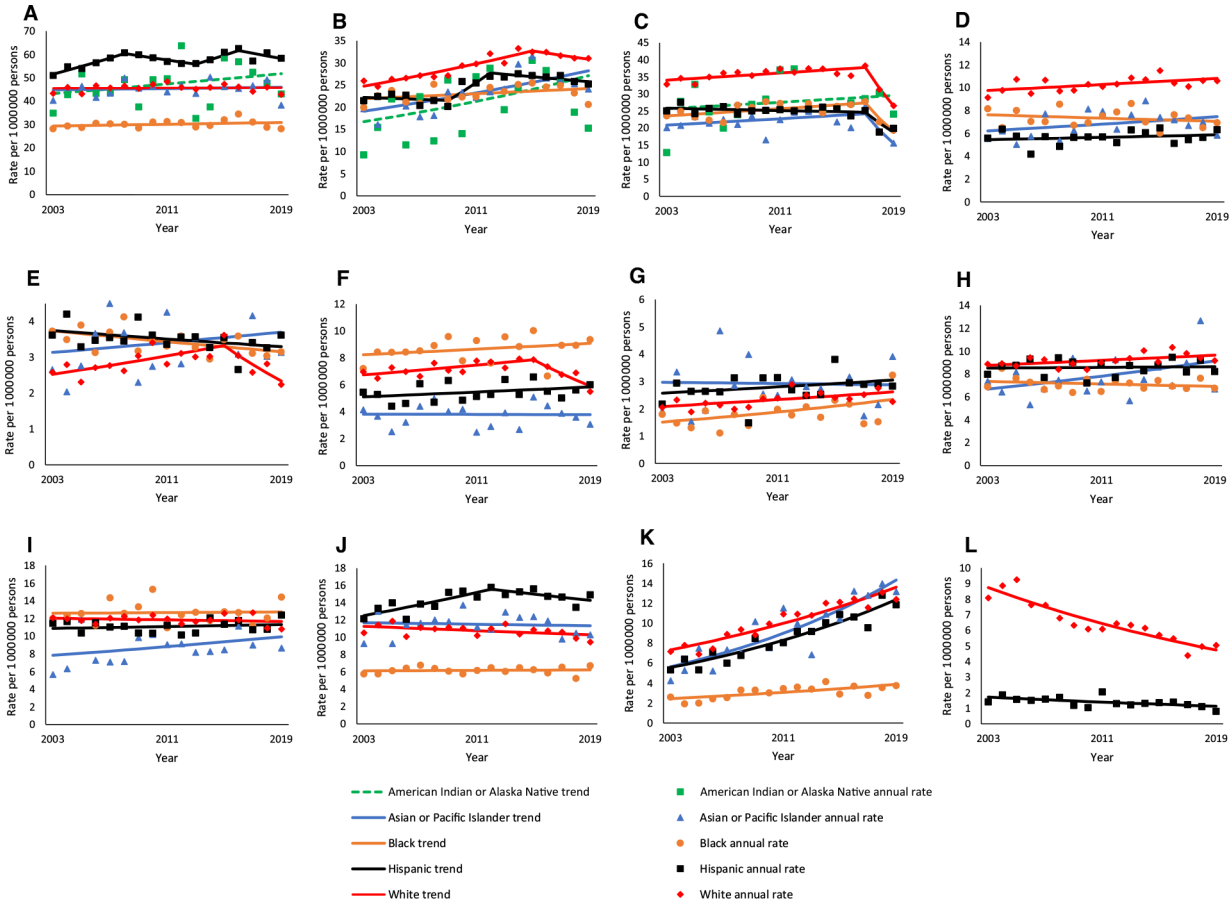

Figure 4.

Trends of pediatric cancer incidence by ICCC group and race and ethnicity for patients aged 0 to 19years—United States, 2003–2019. **A**) I Leukemia, (**B**) II Lymphoma, (**C**) III CNS neoplasms, (**D**) IV Neuroblastoma, (**E**) V Retinoblastoma, (**F**) VI Renal, (**G**) VII Hepatic, (**H**) VIII Bone tumors, (**I**) IX Soft tissue sarcoma, (**J**) X germ cell, (**K**) XI(b) Thyroid, and (**L**) XI(d) Melanoma. Source: US Cancer Statistics. Rates are per 1 million people and age adjusted to the 2000 US standard population (19 age groups—US Census P25–1130). Cases included all malignant cancers. Incidence data are compiled from cancer registries that meet the data quality criteria for all years, 2003–2019 (covering 99.1% of the US population). Race and ethnicity were classified as Non-Hispanic American Indian or Alaska Native, Non-Hispanic Asian or Pacific Islander, Non-Hispanic Black (Black), Non-Hispanic White (White), and Hispanic or Latino (any race) (Hispanic). Registry-specific data quality information is available at https://www.cdc.gov/cancer/uscs/technical_notes/criteria/index.htm. **Markers** depict observed rates, and **lines** represent fitted rates calculated by joinpoint regression. Trends were calculated only if there were 6 or more cases in each calendar year during 2003 to 2019. CNS = central nervous system; ICCC = International Classification of Childhood Cancer.

Table 1.

Age-adjusted and age-specific incidence rate[a] of invasive cancer,[b] ages 0 to 19 years, and trends, by selected characteristics—United States,[c] 2003–2019

	2003		2019		2003–2019			APC_1		APC_2	
Characteristic	**Count**	**Rate**	**Count**	**Rate**	**Count**	**Rate (95% CI)**	**AAPC[d] (95% CI)**	**Years**	**APC[d] (95% CI)**	**Years**	**APC[d] (95% CI)**
Overall	13 327	164.5	14 381	177.2	248 749	178.3 (177.6 to 179.0)	0.5 (0.1 to 0.8)[e]	2003–2016	1.1 (0.9 to 1.3)[e]	2016–2019	−2.1 (−3.8 to −0.3)[e]
Sex											
Male	7040	169.5	7557	182.4	132 557	185.9 (184.9 to 186.9)	0.4 (−0.1 to 0.8)	2003–2016	1.0 (0.8 to 1.2)[e]	2016–2019	−2.5 (−4.6 to −0.2)[e]
Female	6287	159.1	6824	171.8	116 192	170.5 (169.5 to 171.5)	0.6 (0.2 to 1.0)[e]	2003–2016	1.1 (0.9 to 1.4)[e]	2016–2019	−1.6 (−3.8 to 0.7)
Age group, y											
0 to 14	9006	149.4	9565	159.3	168 836	164.0 (163.2 to 164.8)	0.3 (0.0 to 0.7)	2003–2016	1.1 (0.9 to 1.3)[e]	2016–2019	−3.0 (−4.9 to −1.0)[e]
<1	991	251.4	950	254.9	17 690	264.6 (260.7 to 268.5)	0.1 (−0.5 to 0.8)	2003–2015	1.1 (0.6 to 1.6)[e]	2015–2019	−2.8 (−5.4 to −0.1)[e]
0 to 4	4187	215.3	4160	215.0	77 477	230.7 (229.1 to 232.3)	−0.1 (−0.5 to 0.4)	2003–2015	0.9 (0.6 to 1.2)[e]	2015–2019	−2.9 (−4.6 to −1.2)[e]
5–9	2175	111.7	2390	119.3	42 455	125.3 (124.2 to 126.5)	0.4 (−0.2 to 1.0)	2003–2015	1.4 (1.0 to 1.9)[e]	2015–2019	−2.7 (−4.9 to −0.6)[e]
10–14	2644	124.4	3015	146.2	48 904	139.2 (138.0 to 140.4)	1.1 (0.4 to 1.8)[e]	2003–2017	1.5 (1.3 to 1.8)[e]	2017–2019	−1.7 (−7.3 to 4.2)
15–19	4321	209.2	4816	230.6	79 913	221.1 (219.6 to 222.6)	0.8 (0.5 to 1.1)[e]	2003–2019	0.8 (0.5 to 1.1)[e]	–	–
Race and ethnicity[f]											
American Indian or Alaska Native	100	117.0	120	152.7	2274	159.9 (153.4 to 166.6)	1.7 (0.4 to 3.0)[e]	2003–2019	1.7 (0.4 to 3.0)[e]	–	–
Asian or Pacific Islander	451	126.6	725	143.5	11 246	152.2 (149.4 to 155.0)	0.6 (−0.7 to 1.9)	2003–2017	1.7 (1.1 to 2.3)[e]	2017–2019	−6.7 (−16.1 to 3.9)
Black	1609	129.2	1639	132.6	29 053	136.1 (134.6 to 137.7)	0.1 (−0.6 to 0.8)	2003–2016	0.8 (0.4 to 1.2)[e]	2016–2019	−2.9 (−6.5 to 0.8)
Hispanic (all races)	2406	157.7	3720	183.7	55 066	175.7 (174.2 to 177.2)	0.9 (0.6 to 1.1)[e]	2003–2019	0.9 (0.6 to 1.1)[e]	–	–
White	8588	175.2	7847	183.7	147 314	188.9 (188.0 to 189.9)	0.4 (0.0 to 0.7)	2003–2016	1.1 (0.8 to 1.3)[e]	2016–2019	−2.6 (−4.7 to −0.6)[e]
US Census region[g]											

Characteristic	2003		2019		2003–2019			APC_1		APC_2	
	Count	Rate	Count	Rate	Count	Rate (95% CI)	AAPC[d] (95% CI)	Years	APC[d] (95% CI)	Years	APC[d] (95% CI)
Midwest	3056	165.2	3040	176.3	53 987	176.9 (175.4 to 178.4)	0.5 (−0.1 to 1.1)	2003–2016	1.0 (0.7 to 1.4)[e]	2016–2019	−1.7 (−4.8 to 1.4)
Northeast	2604	180.0	2495	190.5	45 435	192.4 (190.6 to 194.1)	0.3 (−0.2 to 0.9)	2003–2017	1.0 (0.7 to 1.2)[e]	2017–2019	−3.8 (−8.4 to 1.0)
South	4699	160.0	5535	173.7	91 624	173.6 (172.5 to 174.8)	0.5 (0.0 to 1.0)[e]	2003–2016	1.2 (0.9 to 1.4)[e]	2016–2019	−2.3 (−4.7 to 0.2)
West	2968	158.7	3311	174.7	57 703	177.1 (175.6 to 178.5)	0.7 (0.4 to 1.0)[e]	2003–2019	0.7 (0.4 to 1.0)[e]	–	–
County-level economic status, by percentile											
Top 25%	4225	172.5	4704	184.6	80 092	186.1 (184.8 to 187.4)	0.5 (0.0 to 1.0)[e]	2003–2016	1.0 (0.8 to 1.3)[e]	2016–2019	−1.8 (−4.3 to 0.7)
Transitional	7459	162.7	7992	175.4	138 065	175.7 (174.8 to 176.7)	0.4 (0.0 to 0.8)[e]	2003–2016	1.0 (0.7 to 1.2)[e]	2016–2019	−1.8 (−3.8 to 0.2)
Bottom 25%	1253	152.3	1232	161.0	22 991	167.7 (165.5 to 169.9)	0.5 (−0.5 to 1.5)	2003–2016	1.7 (1.2 to 2.3)[e]	2016–2019	−4.7 (−9.6 to 0.5)
County-level rural-urban continuum											
Metropolitan areas ≥1 million population	7296	165.7	8129	181.3	139 232	182.1 (181.1 to 183.1)	0.5 (0.2 to 0.9)[e]	2003–2015	1.1 (0.9 to 1.4)[e]	2015–2019	−1.2 (−2.4 to −0.1)[e]
Metropolitan areas of 250 000 to <1 million population	2878	167.0	3085	174.1	53 050	175.9 (174.4 to 177.4)	0.3 (−0.3 to 1.0)	2003–2017	0.8 (0.5 to 1.1)[e]	2017–2019	−3.0 (−8.5 to 2.8)
Metropolitan areas of <250 000 population	1163	157.4	1264	171.2	21 708	170.8 (168.5 to 173.0)	0.7 (0.3 to 1.1)[e]	2003–2019	0.7 (0.3 to 1.1)[e]	–	–
Nonmetropolitan counties	1974	160.0	1896	169.5	34 594	172.0 (170.2 to 173.9)	0.4 (−0.3 to 1.1)	2003–2017	1.2 (0.9 to 1.5)[e]	2017–2019	−4.9 (−10.5 to 1.0)

[a] Rates are per 1 million people. Rates for ages <1 year, 5–9 years, 10–14 years, and 15–19 years are age specific, and the rates for ages 0 to 4 years, 0 to 14 years, and 0 to 19 years are age adjusted to the 2000 US standard population (19 age groups—Us Census P25–1130). Source: US Cancer Statistics. AAPC = average annual percent change; APC = annual percent change; CI = confidence interval.

[b] Cases included all malignant cancers.

[c] Incidence data are compiled from cancer registries that meet the data quality criteria for all years, 2003–2019 (covering 99.1% of the US population). Registry-specific data quality information is available at https://www.cdc.gov/cancer/uscs/technical_notes/criteria/index.htm. Characteristic values with other, missing, or blank results are not included in this table.

[d] Trends were measured with APC or AAPC and rates and were considered to increase or decrease if $P < .05$ (2-sided); otherwise, trends were considered stable. AAPC was not calculated if case count was <6 cases in any 1 year.

[e] Trends were significant at $P < .05$.

[f] Race and ethnicity results were categorized as White, Black, American Indian or Alaska Native, and Asian or Pacific Islander (all Non-Hispanic) and Hispanic or Latino (any race) (Hispanic). Excludes 3796 cases of Non-Hispanic Unknown Race during 2003–2019, including 173 from 2003 and 330 from 2019.

[g] US Census regions defined per www.census.gov, accessible at https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf.

Table 2.

Age-adjusted incidence rate[a] of invasive cancer,[b] ages 0 to 19 years, average annual percent change between rates, and incidence rate ratios, by International Classification of Childhood Cancer group and sex—United States,[c] 2003–2019

ICCC group	Males and Females			Males			Females			Incidence rate ratio, males to females (95% CI)
	No.	Rate	AAPC[d] (95% CI)	No.	Rate	AAPC[d] (95% CI)	No.	Rate	AAPC[d] (95% CI)	
Overall	248 749	178.3	0.5 (0.1 to 0.8)[e]	132 557	185.9	0.4 (−0.1 to 0.8)	116 192	170.5	0.6 (0.2 to 1.0)[e]	1.09 (1.08 to 1.10)[e]
I Leukemias, myeloproliferative diseases, and myelodysplastic diseases	64 575	46.6	0.4 (0.0 to 0.8)[e]	36 129	50.9	0.3 (0 to 0.7)	28 446	42.0	0.7 (0.1 to 1.4)[e]	1.21 (1.19 to 1.23)[e]
I(a) Lymphoid leukemias	46 687	33.8	0.4 (0.0 to 0.8)[e]	26 630	37.6	0.4 (0 to 0.8)	20 057	29.7	0.5 (0.0 to 1.0)[e]	1.27 (1.24 to 1.29)[e]
I(b) Acute myeloid leukemias	10 474	7.5	−0.2 (−0.6 to 0.2)	5421	7.6	−0.5 (−1.1 to 0.1)	5053	7.4	0.2 (−0.4 to 0.7)	1.02 (0.99 to 1.06)
I(c) Chronic myeloproliferative diseases	3440	2.5	−0.7 (−2.8 to 1.5)	1829	2.5	−0.8 (−3.8 to 2.2)	1611	2.4	0.6 (−1.3 to 2.6)	1.08 (1.01 to 1.16)[e]
I(d) Myelodysplastic syndrome and other myeloproliferative diseases	1885	1.4	−1.1 (−2.2 to 0.1)	1063	1.5	−1.1 (−2.8 to 0.7)	822	1.2	−1.0 (−2.2 to 0.2)	1.24 (1.13 to 1.36)[e]
I(e) Unspecified and other specified leukemias	2089	1.5	4.2 (3.1 to 5.4)[e]	1186	1.7	3.7 (2.3 to 5.2)[e]	903	1.3	4.9 (3.2 to 6.5)[e]	1.25 (1.15 to 1.37)[e]
II Lymphomas and reticuloendothelial neoplasms	38 308	27.3	1.2 (0.4 to 2.1)[e]	23 021	32.2	1.2 (0.3 to 2.0)[e]	15 287	22.3	0.9 (−0.4 to 2.1)	1.44 (1.41 to 1.47)[e]
II(a) Hodgkin lymphomas	17 319	12.3	−0.1 (−0.4 to 0.2)	9266	12.8	−0.1 (−0.5 to 0.3)	8053	11.6	−0.1 (−0.7 to 0.5)	1.10 (1.07 to 1.14)[e]
II(b) Non-Hodgkin lymphomas (except Burkitt lymphoma)	12 600	9.0	1.2 (0.6 to 1.8)[e]	8032	11.2	1.3 (0.7 to 1.9)[e]	4568	6.7	1.0 (0.3 to 1.7)[e]	1.68 (1.62 to 1.74)[e]
II(c) Burkitt lymphoma	3330	2.4	−0.5 (−1.1 to 0.2)	2676	3.8	−0.4 (−1.1 to 0.3)	654	1.0	−0.6 (−2.7 to 1.5)	3.91 (3.59 to 4.27)[e]
II(d) Miscellaneous lymphoreticular neoplasms	4601	3.3	9.8 (1.1 to 19.3)[e]	2756	3.9	11.1 (2.0 to 21.0)[e]	1845	2.7	8.1 (−2.4 to 19.7)	1.43 (1.35 to 1.51)[e]
II(e) Unspecified lymphomas	458	0.3	−1.7 (−6.2 to 3.0)	291	0.4	−0.9 (−6.8 to 5.5)	167	0.2	_[f]	1.66 (1.37 to 2.03)[e]
III CNS and miscellaneous intracranial and intraspinal neoplasms	42 630	30.8	−1.7 (−2.7 to −0.6)[e]	22 873	32.3	−1.6 (−2.8 to −0.5)[e]	19 757	29.2	−1.7 (−3.1 to −0.3)[e]	1.11 (1.09 to 1.13)[e]
III(a) Ependymomas and choroid plexus tumor	3618	2.6	−0.1 (−1.1 to 0.8)	2014	2.8	0.4 (−0.5 to 1.3)	1604	2.4	−0.3 (−7.4 to 7.3)	1.20 (1.12 to 1.28)[e]
III(b) Astrocytomas	22 015	15.9	−1.3 (−3.1 to 0.5)	11 498	16.2	−0.9 (−2.0 to 0.3)	10 517	15.6	−1.5 (−3.9 to 1.0)	1.04 (1.02 to 1.07)[e]
III(c) Intracranial and intraspinal embryonal tumors	7976	5.8	−3.7 (−5.5 to −1.8)[e]	4793	6.8	−3.5 (−5.3 to −1.8)[e]	3183	4.7	−3.8 (−6.8 to −0.7)[e]	1.44 (1.38 to 1.51)[e]
III(d) Other gliomas	7448	5.4	−1.5 (−4.0 to 1.1)	3749	5.3	−1.9 (−3.7 to −0.1)[e]	3699	5.5	0.3 (−1.0 to 0.6)	0.97 (0.93 to 1.01)

ICCC group	Males and Females			Males			Females			Incidence rate ratio, males to females (95% CI)
	No.	Rate	AAPC[d] (95% CI)	No.	Rate	AAPC[d] (95% CI)	No.	Rate	AAPC[d] (95% CI)	
III(e) Other specified intracranial/ intraspinal neoplasms	908	0.7	−2.0 (−8.2 to 4.7)	478	0.7	−0.4 (−2.5 to 1.8)	430	0.6	0.4 (−1.6 to 2.4)	1.06 (0.93 to 1.21)
III(f) Unspecified intracranial and intraspinal neoplasms	665	0.5	1.1 (−0.8 to 2.9)	341	0.5	1.7 (−0.4 to 3.8)	324	0.5	0.3 (−2.2 to 3.2)	1.00 (0.86 to 1.17)
IV Neuroblastoma and other peripheral nervous cell tumors	11 907	8.6	0.4 (−0.1 to 0.9)	6286	8.9	0.4 (−0.1 to 0.9)	5621	8.3	0.4 (−0.2 to 1.0)	1.07 (1.03 to 1.11)[e]
IV(a) Neuroblastoma and ganglioneuroblastoma	11 575	8.4	0.4 (−0.1 to 0.8)	6110	8.6	0.4 (−0.2 to 0.9)	5465	8.1	0.4 (−0.2 to 1.0)	1.07 (1.03 to 1.11)[e]
IV(b) Other peripheral nervous cell tumors	332	0.2	1.0 (−1.6 to 3.6)	176	0.3	_[f]	156	0.2	_[f]	1.08 (0.86 to 1.35)
V Retinoblastoma	4424	3.2	−0.4 (−1.4 to 0.6)	2226	3.1	0.1 (−0.9 to 1.1)	2198	3.2	0 (−1.0 to 0.1)	0.97 (0.91 to 1.03)
VI Renal tumors	9506	6.9	−0.3 (−1.1 to 0.6)	4446	6.3	0.1 (−0.7 to 0.9)	5060	7.5	0.2 (−0.7 to 1.1)	0.84 (0.81 to 0.87)[e]
VI(a) Nephroblastoma and other nonepithelial renal tumors	8583	6.2	−0.4 (−1.2 to 0.5)	3998	5.7	−0.1 (−0.9 to 0.8)	4585	6.8	0.1 (−0.7 to 1.0)	0.83 (0.80 to 0.87)[e]
VI(b) Renal carcinomas	875	0.6	1.3 (−0.3 to 2.9)	423	0.6	1.7 (−0.2 to 3.6)	452	0.7	1.0 (−0.7 to 2.7)	0.90 (0.78 to 1.02)
VI(c) Unspecified malignant renal tumors	48	0.0	_[f]	25	0.0	_[f]	23	0.0	_[f]	1.05 (0.57 to 1.93)
VII Hepatic tumors	3382	2.4	1.6 (0.7 to 2.4)[e]	1995	2.8	1.1 (0 to 2.3)	1387	2.0	2.2 (1.1 to 3.2)[e]	1.38 (1.28 to 1.48)[e]
VII(a) Hepatoblastoma	2522	1.8	1.9 (0.9 to 3.0)[e]	1532	2.2	1.6 (0.2 to 3.0)[e]	990	1.5	2.5 (1.2 to 3.7)[e]	1.48 (1.37 to 1.60)[e]
VII(b) Hepatic carcinomas	822	0.6	0.4 (−0.8 to 1.5)	439	0.6	−0.5 (−1.8 to 0.9)	383	0.6	1.4 (−0.7 to 3.6)	1.10 (0.95 to 1.26)
VII(c) Unspecified malignant hepatic tumors	38	0.0	_[f]	24	0.0	_[f]	14	0.0	_[f]	_[f]
VIII Malignant bone tumors	12 213	8.7	0.5 (0.1 to 0.9)[e]	6946	9.7	0.7 (−0.9 to 2.4)	5267	7.8	0 (−0.5 to 0.5)	1.25 (1.21 to 1.30)[e]
VIII(a) Osteosarcomas	6792	4.9	0.1 (−0.3 to 0.6)	3876	5.4	0.8 (0.1 to 1.6)[e]	2916	4.3	−0.7 (−1.4 to −0.1)[e]	1.26 (1.20 to 1.32)[e]
VIII(b) Chondrosarcomas	463	0.3	0.2 (−2.0 to 2.4)	285	0.4	−1.2 (−4.1 to 1.7)	178	0.3	_[f]	1.52 (1.26 to 1.85)[e]
VIII(c) Ewing tumor and related sarcomas of bone	4031	2.9	0.8 (0.0 to 1.6)[e]	2311	3.2	0.9 (−0.2 to 2.0)	1720	2.5	0.6 (−0.4 to 1.7)	1.28 (1.20 to 1.36)[e]
VIII(d) Other specified malignant bone tumors	651	0.5	1.6 (−0.1 to 3.3)	315	0.4	1.7 (0 to 3.4)[e]	336	0.5	1.5 (−0.7 to 3.7)	0.90 (0.77 to 1.05)
VIII(e) Unspecified malignant bone tumors	276	0.2	1.5 (−0.6 to 3.6)	159	0.2	2.4 (−1.7 to 6.6)	117	0.2	_[f]	1.29 (1.01 to 1.65)[e]
IX Soft tissue and other extraosseous sarcomas	16 457	11.8	0.1 (−0.2 to 0.4)	8985	12.6	0.2 (−0.3 to 0.6)	7472	11.0	0 (−0.5 to 0.4)	1.15 (1.11 to 1.18)[e]

ICCC group	Males and Females			Males			Females			Incidence rate ratio, males to females (95% CI)
	No.	Rate	AAPC[d] (95% CI)	No.	Rate	AAPC[d] (95% CI)	No.	Rate	AAPC[d] (95% CI)	
IX(a) Rhabdomyosarcomas	6381	4.6	−0.1 (−0.9 to 0.7)	3660	5.2	−0.1 (−0.9 to 0.7)	2721	4.0	−0.1 (−1.3 to 1.2)	1.28 (1.22 to 1.35)[e]
IX(b) Fibrosarcomas, peripheral nerve and other fibrous	1694	1.2	−1.0 (−2.4 to 0.5)	883	1.2	−0.6 (−2.0 to 0.8)	811	1.2	−1.3 (−3.2 to 0.5)	1.04 (0.94 to 1.14)
IX(c) Kaposi sarcoma	62	0.0	_[f]	52	0.1	_[f]	10	0.0	_[f]	_[f]
IX(d) Other specified soft tissue sarcomas	6482	4.6	0.0 (−0.4 to 0.4)	3394	4.7	0.1 (−0.6 to 0.7)	3088	4.5	−0.1 (−0.6 to 0.5)	1.05 (1.00 to 1.10)
IX(e) Unspecified soft tissue sarcomas	1838	1.3	1.9 (0.7 to 3.1)[e]	996	1.4	2.2 (1.0 to 3.4)[e]	842	1.2	1.2 (−0.9 to 3.5)	1.13 (1.03 to 1.24)[e]
X Germ cell tumors, trophoblastic tumors neoplasms of gonads	15 549	11.0	0.1 (−0.4 to 0.6)	9784	13.4	0.1 (−0.6 to 0.7)	5765	8.4	0.2 (−0.3 to 0.7)	1.59 (1.54 to 1.65)[e]
X(a) Intracranial and intraspinal germ cell tumors	2379	1.7	1.2 (0.1 to 2.3)[e]	1723	2.4	0.9 (−0.2 to 2.1)	656	1.0	1.8 (−0.6 to 4.3)	2.47 (2.26 to 2.71)[e]
X(b) Extracranial and extragonadal germ cell tumors	2000	1.4	−0.3 (−1.2 to 0.6)	876	1.2	0.2 (−1.3 to 1.6)	1124	1.7	−0.7 (−1.6 to 0.3)	0.74 (0.68 to 0.81)[e]
X(c) Malignant gonadal germ cell tumors	10 072	7.1	−0.2 (−0.8 to 0.5)	7043	9.6	−0.2 (−0.9 to 0.6)	3029	4.4	−0.1 (−0.7 to 0.5)	2.17 (2.08 to 2.27)[e]
X(d) Gonadal carcinomas	609	0.4	0.7 (−1.3 to 2.6)	47	0.1	_[f]	562	0.8	0.7 (−1.4 to 2.8)	0.08 (0.06 to 0.11)[e]
X(e) Other and unspecified malignant gonadal tumors	489	0.4	2.1 (0.1 to 4.2)[e]	95	0.1	_[f]	394	0.6	1.5 (−0.6 to 3.7)	0.23 (0.18 to 0.29)[e]
XI Other malignant epithelial neoplasms and melanomas	27 782	19.6	2.6 (1.7 to 3.5)[e]	8947	12.4	2.2 (1.3 to 3.0)[e]	18 835	27.2	3.0 (2.4 to 3.7)[e]	0.45 (0.44 to 0.47)[e]
XI(a) Adrenocortical carcinomas	288	0.2	0.7 (−2.1 to 3.6)	109	0.2	_[f]	179	0.3	−0.5 (−3.5 to 2.5)	0.58 (0.46 to 0.74)[e]
XI(b) Thyroid carcinomas	12 459	8.8	4.2 (3.6 to 4.9)[e]	2302	3.2	4.1 (2.7 to 5.6)[e]	10 157	14.7	4.2 (3.5 to 4.9)[e]	0.22 (0.21 to 0.23)[e]
XI(c) Nasopharyngeal carcinomas	744	0.5	−1.8 (−3.8 to 0.3)	504	0.7	−2.2 (−4.7 to 0.3)	240	0.4	−0.5 (−2.8 to 1.9)	2.00 (1.71 to 2.34)[e]
XI(d) Malignant melanomas	6247	4.4	−4.1 (−4.9 to −3.3)[e]	2564	3.6	−4.1 (−5.4 to −2.8)[e]	3683	5.3	−4.2 (−5.2 to −3.2)	0.67 (0.63 to 0.70)[e]
XI(e) Skin carcinomas	118	0.1	_[f]	57	0.1	_[f]	61	0.1	_[f]	0.89 (0.61 to 1.31)
XI(f) Other and unspecified carcinomas	7926	5.6	5.4 (3.7 to 7.2)[e]	3411	4.7	5.6 (3.5 to 7.9)[e]	4515	6.5	5.2 (2.3 to 8.2)[e]	0.72 (0.69 to 0.75)[e]
XII Other and unspecified malignant neoplasms	1168	0.8	0.3 (−1.3 to 1.9)	509	0.7	−1.2 (−9.4 to 7.8)	659	1.0	−0.3 (−2.2 to 1.7)	0.74 (0.66 to 0.83)[e]
XII(a) Other specified malignant tumors	579	0.4	1.7 (−0.3 to 3.7)	249	0.4	2.3 (−0.3 to 5.1)	330	0.5	0.9 (−1.8 to 3.7)	0.72 (0.61 to 0.85)[e]
XII(b) Other unspecified malignant tumors	589	0.4	−0.9 (−3.1 to 1.2)	260	0.4	0.2 (−3.0 to 0.6)	329	0.5	−1.4 (−3.9 to 1.2)	0.76 (0.64 to 0.90)[e]

ICCC group	Males and Females			Males			Females			Incidence rate ratio, males to females (95% CI)
	No.	Rate	AAPC[d] (95% CI)	No.	Rate	AAPC[d] (95% CI)	No.	Rate	AAPC[d] (95% CI)	
Not classified by ICCC or in situ	848	0.6	19.6 (6.5 to 34.2)[e]	410	0.6	_[f]	438	0.7	19.4 (5.0 to 35.8)[e]	0.90 (0.78 to 1.03)

[a]Rates are per 1 million people and age-adjusted to the 2000 US standard population (19 age groups—US Census P25–1130). Source: US Cancer Statistics. AAPC = average annual percent change; CI = confidence interval; CNS = central nervous system; ICCC = International Classification of Childhood Cancer.

[b]Cases included all malignant cancers.

[c]Incidence data are compiled from cancer registries that meet the data quality criteria for all years, 2003–2019 (covering 99.1% of the US population). Registry-specific data quality information is available at https://www.cdc.gov/cancer/uscs/technical_notes/criteria/index.htm. Characteristic values with other, missing, or blank results are not included in this table.

[d]Trends were measured with AAPC, and rates and were considered to increase or decrease if $P < .05$; otherwise, trends were considered stable. AAPC was not calculated if case count was <6 cases in any 1 year.

[e]Difference was significant at $P < .05$ (2-sided).

[f]Statistic could not be calculated because of low number of cases.

Table 3.

Age-adjusted incidence rate[a] of invasive cancer,[b] aged 0 to 19 years, and average annual percent change between rates, by International Classification of Childhood Cancer group and race and ethnicity[c]—United States,[d] 2003–2019

	American Indian or Alaska Native			Asian or Pacific Islander			Black			Hispanic (all races)			White		
ICCC group	**No.**	**Rate**	**AAPC[e] (95% CI)**	**No.**	**Rate**	**AAPC[e] (95% CI)**	**No.**	**Rate**	**AAPC[e] (95% CI)**	**No.**	**Rate**	**AAPC[e] (95% CI)**	**No.**	**Rate**	**AAPC[e] (95% CI)**
I Leukemias, myeloproliferative diseases, and myelodysplastic diseases	657	46.7	1.1 (−0.8 to 3.1)	3375	45.4	0.2 (−0.6 to 0.9)	6387	30.1	0.3 (−0.3 to 0.9)	18 399	57.9	0.8 (−0.7 to 2.2)	34 931	45.6	0 (−0.3 to 0.4)
I(a) Lymphoid leukemias	456	32.6	1.8 (−0.3 to 4.0)	2362	31.6	0.2 (−0.9 to 1.2)	3798	18.0	0.1 (−0.7 to 0.8)	13 977	43.9	1.0 (−1.1 to 3.0)	25 534	33.6	0 (−0.4 to 0.4)
I(b) Acute myeloid leukemias	118	8.3	_f	625	8.5	0.3 (−1.8 to 2.4)	1489	7.0	−0.7 (−2.2 to 0.8)	2582	8.2	−0.1 (−0.7 to 0.5)	5547	7.1	−0.4 (−1.0 to 0.2)
I(c) Chronic myeloproliferative diseases	32	2.2	_f	173	2.4	_f	574	2.7	1.8 (−0.6 to 4.2)	759	2.5	−0.8 (−2.5 to 1.0)	1823	2.3	−1.4 (−5.2 to 2.5)
I(d) Myelodysplastic syndrome and other myeloproliferative diseases	27	1.9	_f	112	1.5	_f	249	1.2	0.5 (−1.9 to 3.0)	457	1.4	−0.1 (−1.6 to 1.5)	1007	1.3	−2.2 (−4.1 to −0.3)[g]
I(e) Unspecified and other specified leukemias	24	1.7	_f	103	1.4	_f	277	1.3	5.7 (2.6 to 8.9)[g]	624	2.0	3.0 (1.1 to 4.9)[g]	1020	1.3	4.2 (2.7 to 5.8)[g]
II Lymphomas and reticuloendothelial neoplasms	295	20.6	3.1 (−0.4 to 6.6)	1718	23.5	2.5 (1.1 to 3.9)[g]	4962	23.0	0.6 (−0.2 to 1.4)	7548	24.6	0.9 (−0.9 to 2.8)	23 228	29.2	1.4 (0.6 to 2.2)[g]
II(a) Hodgkin lymphomas	104	7.1	_f	595	8.2	1.0 (−1.0 to 3.1)	2254	10.4	0.1 (−0.9 to 1.0)	3083	10.3	−0.6 (−1.1 to −0.1)[g]	11 092	13.6	0.1 (−0.3 to 0.5)
II(b) Non-Hodgkin lymphomas (except Burkitt lymphoma)	97	6.8	_f	689	9.5	0.9 (−1.3 to 3.2)	2066	9.6	0.7 (−0.4 to 1.9)	2512	8.2	1.3 (0.5 to 2.1)[g]	7015	8.9	1.2 (0.6 to 1.7)[g]
II(c) Burkitt lymphoma	34	2.4	_f	173	2.4	_f	305	1.4	−1.9 (−4.4 to 0.7)	495	1.6	−1.2 (−3.2 to 0.8)	2281	3.0	−0.2 (−1.1 to 0.6)
II(d) Miscellaneous lymphoreticular neoplasms	54	3.9	_f	246	3.3	_f	259	1.2	_f	1349	4.1	8.0 (−7.2 to 25.7)	2601	3.4	11.5 (4.3 to 19.2)[g]
II(e) Unspecified lymphomas	6	0.4	_f	15	0.2	_f	78	0.4	_f	109	0.4	_f	239	0.3	0.8 (−3.6 to 5.3)
III CNS and miscellaneous intracranial and intraspinal neoplasms	380	27.0	0.9 (−1.5 to 3.3)	1607	21.8	−1.9 (−5.8 to 2.3)	5248	24.9	−1.3 (−3.9 to 1.3)	7780	24.5	−2.0 (−3.5 to −0.5)[g]	26 951	35.1	−1.6 (−2.9 to −0.2)[g]

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ICCC group	American Indian or Alaska Native			Asian or Pacific Islander			Black			Hispanic (all races)			White		
	No.	Rate	AAPC[e] (95% CI)	No.	Rate	AAPC[e] (95% CI)	No.	Rate	AAPC[e] (95% CI)	No.	Rate	AAPC[e] (95% CI)	No.	Rate	AAPC[e] (95% CI)
III(a) Ependymomas and choroid plexus tumor	33	2.3	_f	160	2.1	_f	446	2.1	0.7 (−1.7 to 3.3)	826	2.6	−1.5 (−3.0 to 0.1)	2112	2.8	0.2 (−0.9 to 1.3)
III(b) Astrocytomas	194	13.8	0.4 (−2.4 to 3.3)	738	10.0	0.5 (−1.4 to 2.6)	2563	12.1	0.2 (−1.0 to 1.4)	3671	11.7	−1.0 (−2.5 to 0.6)	14 470	18.8	−1.2 (−3.2 to 0.9)
III(c) Intracranial and intraspinal embryonal tumors	73	5.2	_f	397	5.3	0.1 (−2.5 to 2.7)	878	4.2	−3.0 (−4.9 to −1.0)[g]	1676	5.2	−2.4 (−3.6 to −1.3)[g]	4858	6.4	−3.9 (−6.9 to −0.9)[g]
III(d) Other gliomas	60	4.3	_f	268	3.7	−2.1 (−4.8 to 0.8)	1031	4.9	−1.3 (−6.0 to 3.6)	1311	4.2	−1.0 (−2.4 to 0.4)	4658	6.0	−1.3 (−4.4 to 1.8)
III(e) Other specified intracranial/intraspinal neoplasms	12	0.9	_f	21	0.3	_f	222	1.1	−1.5 (−3.7 to 0.7)	164	0.5	1.5 (−2.4 to 5.7)	475	0.6	0.2 (−1.8 to 2.3)
III(f) Unspecified intracranial and intraspinal neoplasms	8	0.6	_f	23	0.3	_f	108	0.5	_f	132	0.4	_f	378	0.5	0.8 (−1.8 to 3.5)
IV Neuroblastoma and other peripheral nervous cell tumors	93	6.7	_f	524	6.8	1.1 (−0.5 to 2.9)	1540	7.3	−0.5 (−1.6 to 0.6)	1903	5.7	0.5 (−0.6 to 1.6)	7671	10.3	0.6 (0.1 to 1.2)[g]
IV(a) Neuroblastoma and ganglioneuroblastoma	90	6.5	_f	515	6.7	1.2 (−0.4 to 3.0)	1484	7.0	−0.6 (−1.6 to 0.4)	1839	5.4	0.5 (−0.6 to 1.6)	7474	10.0	0.6 (0.1 to 1.1)[g]
IV(b) Other peripheral nervous cell tumors	_h	_f	_f	9	0.1	_f	56	0.3	_f	64	0.2	_f	197	0.3	2.0 (−1.3 to 5.3)
V Retinoblastoma	44	3.2	_f	261	3.4	1.0 (−1.4 to 3.6)	725	3.4	−1.0 (−1.9 to −0.2)[g]	1196	3.5	−0.8 (−1.7 to 0.2)	2121	2.9	−0.5 (−2.6 to 1.7)
VI Renal tumors	93	6.7	_f	283	3.7	−0.1 (−2.4 to 2.3)	1816	8.6	0.6 (−0.5 to 1.7)	1808	5.5	0.8 (−0.4 to 2.1)	5363	7.1	−0.8 (−2.2 to 0.6)
VI(a) Nephroblastoma and other nonepithelial renal tumors	81	5.8	_f	246	3.2	−0.8 (−3.4 to 1.8)	1576	7.5	0.5 (−0.6 to 1.7)	1657	5.0	0.7 (−0.5 to 1.9)	4898	6.5	−0.9 (−2.3 to 0.6)
VI(b) Renal carcinomas	11	0.8	_f	32	0.4	_f	232	1.1	1.1 (−1.7 to 3.9)	142	0.5	_f	444	0.6	1.1 (−0.5 to 2.7)
VI(c) Unspecified malignant renal tumors	_h	_f	_f	_h	_f	_f	8	0.0	_f	9	0.0	_f	21	0.0	_f
VII Hepatic tumors	41	2.9	_f	213	2.8	−0.2 (−3.5 to 3.2)	393	1.9	2.8 (0.2 to 5.4)[g]	917	2.8	1.1 (−0.8 to 2.9)	1769	2.3	1.4 (0.4 to 2.4)[g]
VII(a) Hepatoblastoma	35	2.5	_f	162	2.1	_f	275	1.3	4.2 (1.0 to 7.5)[g]	714	2.1	1.6 (−0.5 to 3.7)	1300	1.7	1.5 (0.3 to 2.7)[g]

ICCC group	American Indian or Alaska Native			Asian or Pacific Islander			Black			Hispanic (all races)			White		
	No.	Rate	AAPC[e] (95% CI)	No.	Rate	AAPC[e] (95% CI)	No.	Rate	AAPC[e] (95% CI)	No.	Rate	AAPC[e] (95% CI)	No.	Rate	AAPC[e] (95% CI)
VII(b) Hepatic carcinomas	6	0.4	_f	50	0.7	_f	110	0.5	_f	195	0.6	_f	451	0.6	1.2 (−0.7 to 3.2)
VII(c) Unspecified malignant hepatic tumors	_h	_f	_f	_h	_f	_f	8	0.0	_f	8	0.0	_f	18	0.0	_f
VIII Malignant bone tumors	113	7.9	_f	561	7.8	2.0 (−0.3 to 4.3)	1529	7.1	−0.4 (−1.2 to 0.4)	2584	8.6	0.1 (−0.8 to 0.9)	7279	9.2	0.6 (0.1 to 1.1)[g]
VIII(a) Osteosarcomas	61	4.2	_f	322	4.5	0.9 (−1.9 to 3.7)	1212	5.6	−0.6 (−1.6 to 0.5)	1542	5.1	−0.4 (−1.3 to 0.5)	3582	4.5	0.3 (−0.3 to 1.0)
VIII(b) Chondrosarcomas	_h	_f	_f	14	0.2	_f	60	0.3	_f	86	0.3	_f	292	0.4	−0.7 (−3.5 to 2.1)
VIII(c) Ewing tumor and related sarcomas of bone	40	2.8	_f	169	2.3	_f	124	0.6	_f	734	2.4	0.5 (−1.5 to 2.5)	2918	3.7	0.9 (0.1 to 1.7)[g]
VIII(d) Other specified malignant bone tumors	7	0.5	_f	46	0.6	_f	76	0.4	_f	154	0.5	_f	356	0.5	1.2 (−1.7 to 4.1)
VIII(e) Unspecified malignant bone tumors	_h	_f	_f	10	0.1	_f	57	0.3	_f	68	0.2	_f	131	0.2	_f
IX Soft tissue and other extraosseous sarcomas	154	10.8	_f	646	8.8	1.5 (−0.5 to 3.5)	2702	12.6	0.1 (−0.9 to 1.1)	3441	11.1	0.2 (−0.4 to 0.9)	9241	11.8	−0.2 (−0.6 to 0.3)
IX(a) Rhabdomyosarcomas	61	4.4	_f	248	3.3	1.9 (−0.2 to 4.1)	1058	5.0	0.0 (−1.5 to 1.5)	1339	4.2	−0.3 (−1.6 to 1.1)	3598	4.7	−0.3 (−1.2 to 0.7)
IX(b) Fibrosarcomas, peripheral nerve and other fibrous	18	1.3	_f	64	0.9	_f	274	1.3	−2.0 (−4.5 to 0.6)	332	1.1	−2.3 (−4.6 to 0.1)	966	1.2	−0.5 (−2.5 to 1.4)
IX(c) Kaposi sarcoma	_h	_f	_f	_h	_f	_f	38	0.2	_f	13	0.0	_f	10	0.0	_f
IX(d) Other specified soft tissue sarcomas	65	4.5	_f	262	3.6	2.0 (−1.3 to 5.5)	1022	4.7	−0.1 (−1.4 to 1.3)	1391	4.6	0.7 (−0.2 to 1.7)	3613	4.6	−0.5 (−0.9 to −0.1)[g]
IX(e) Unspecified soft tissue sarcomas	10	0.7	_f	71	1.0	_f	310	1.5	2.3 (−0.1 to 4.7)	366	1.2	2.6 (0.5 to 4.7)[g]	1054	1.3	1.7 (−0.1 to 3.5)
X Germ cell tumors, trophoblastic tumors, and neoplasms of gonads	140	9.6	_f	838	11.4	−0.2 (−1.4 to 1.1)	1335	6.2	0.1 (−0.6 to 0.8)	4338	14.4	0.8 (−0.3 to 1.9)	8699	10.8	−0.6 (−1.1 to 0.0)[g]
X(a) Intracranial and intraspinal germ cell tumors	14	1.0	_f	245	3.4	−0.9 (−4.0 to 2.3)	227	1.1	4.2 (0.8 to 7.7)[g]	551	1.8	1.0 (−0.3 to 2.4)	1321	1.7	0.7 (−0.8 to 2.2)
X(b) Extracranial and extragonadal germ cell tumors	18	1.3	_f	147	2.0	−1.8 (−4.2 to 0.7)	274	1.3	−0.9 (−2.8 to 1.0)	486	1.5	−0.8 (−2.2 to 0.5)	1035	1.4	−0.3 (−2.0 to 1.5)

ICCC group	American Indian or Alaska Native			Asian or Pacific Islander			Black			Hispanic (all races)			White		
	No.	Rate	AAPC[e] (95% CI)	No.	Rate	AAPC[e] (95% CI)	No.	Rate	AAPC[e] (95% CI)	No.	Rate	AAPC[e] (95% CI)	No.	Rate	AAPC[e] (95% CI)
X(c) Malignant gonadal germ cell tumors	98	6.6	_f	397	5.4	0.0 (−1.9 to 2.0)	684	3.2	−1.0 (−2.2 to 0.1)	3054	10.2	1.1 (0.1 to 2.1)[g]	5717	7.0	−1.2 (−1.8 to −0.5)[g]
X(d) Gonadal carcinomas	7	0.5	_f	41	0.6	_f	52	0.2	_f	136	0.5	_f	368	0.5	1.4 (−1.0 to 4.0)
X(e) Other and unspecified malignant gonadal tumors	_h	_f	_f	8	0.1	_f	98	0.5	_f	111	0.4	_f	258	0.3	1.4 (−0.7 to 3.4)
XI Other malignant epithelial neoplasms and melanomas	239	16.3	4.1 (2.0 to 6.2)[g]	1136	15.7	4.6 (3.3 to 6.0)[g]	2131	9.8	1.4 (0.3 to 2.5)[g]	4701	15.8	4.9 (4.2 to 5.7)[g]	18 934	23.3	2.4 (1.3 to 3.5)[g]
XI(a) Adrenocortical carcinomas	_h	_f	_f	12	0.2	_f	19	0.1	_f	63	0.2	_f	184	0.2	_f
XI(b) Thyroid carcinomas	103	7.0	_f	689	9.5	6.0 (4.1 to 7.9)[g]	670	3.1	2.9 (1.2 to 4.7)[g]	2585	8.7	5.1 (4.1 to 6.1)[g]	8210	10.0	3.9 (3.2 to 4.7)[g]
XI(c) Nasopharyngeal carcinomas	10	0.7	_f	53	0.7	3.9 (1.3 to 6.5)[g]	314	1.4	−3.7 (−6.8 to −0.6)[g]	118	0.4	_f	240	0.3	−1.6 (−3.9 to 0.8)
XI(d) Malignant melanomas	32	2.2	_f	70	1.0	_f	109	0.5	_f	416	1.4	−2.6 (−4.6 to −0.5)[g]	5349	6.6	−3.8 (−4.6 to −2.9)[g]
XI(e) Skin carcinomas	_h	_f	_f	_h	_f	_f	24	0.1	_f	16	0.1	_f	67	0.1	_f
XI(f) Other and unspecified carcinomas	87	5.9	_f	307	4.2	3.9 (1.3 to 6.5)[g]	995	4.6	2.4 (0.6 to 4.1)[g]	1503	5.1	5.8 (0.8 to 11.0)[g]	4884	6.0	6.5 (4.3 to 8.8)[g]
XII Other and unspecified malignant neoplasms	13	0.9	_f	43	0.6	_f	195	0.9	_f	248	0.8	0.1 (−2.9 to 3.3)	638	0.8	0.5 (−1.3 to 2.3)
XII(a) Other specified malignant tumors	7	0.5	_f	23	0.3	_f	82	0.4	_f	120	0.4	_f	342	0.4	1.3 (−0.9 to 3.6)
XII(b) Other unspecified malignant tumors	6	0.4	_f	20	0.3	_f	113	0.5	_f	128	0.4	_f	296	0.4	−0.6 (−3.0 to 1.8)
Not classified by ICCC or in situ	12	0.9	_f	41	0.6	_f	90	0.4	_f	203	0.6	_f	489	0.6	_f

[a]Rates are per 1 million people and age adjusted to the 2000 US standard population (19 age groups—US Census P25–1130). Source: US Cancer Statistics. AAPC = average annual percent change; CI = confidence interval; CNS = central nervous system; ICCC = International Classification of Childhood Cancer.

[b]Cases included all malignant cancers.

[c]Race and ethnicity results were categorized as White, Black, American Indian or Alaska Native, and Asian or Pacific Islander (all Non-Hispanic) and Hispanic or Latino (any race) (Hispanic).

[d] Incidence data are compiled from cancer registries that meet the data quality criteria for all years, 2003–2019 (covering 99.1% of the US population). Registry-specific data quality information is available at https://www.cdc.gov/cancer/uscs/technical_notes/criteria/index.htm. Characteristic values with other, missing, or blank results are not included in this table.

[e] Trends were measured with AAPC, and rates and were considered to increase or decrease if $P < .05$ (2-sided); otherwise, trends were considered stable. AAPC was not calculated if case count was <6 cases in any 1 year.

[f] Statistic could not be calculated because of a low number of cases.

[g] Trends were significant at $P < .05$.

[h] Cell suppressed because there were <6 cases.

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Table 4.

Age-adjusted and age-specific incidence rate[a] of invasive cancer,[b] ages 0 to 19 years, and average annual percent change between rates, by International Classification of Childhood Cancer group and age group—United States,[c] 2003–2019

	Age <1 y			Age 0 to 4 y			Age 5–9 y			Age 10–14 y			Age 15–19 y		
ICCC group	**No.**	**Rate**	**AAPC[d] (95% CI)**	**No.**	**Rate**	**AAPC[d] (95% CI)**	**No.**	**Rate**	**AAPC[d] (95% CI)**	**No.**	**Rate**	**AAPC[d] (95% CI)**	**No.**	**Rate**	**AAPC[d] (95% CI)**
I Leukemias, myeloproliferative diseases, and myelodysplastic diseases	3381	50.6	−0.5 (−1.2 to 0.3)	27 680	82.4	−0.1 (−0.6 to 0.3)	14 087	41.6	0.5 (0.1 to 0.9)[e]	11 127	31.7	1.1 (0.5 to 1.7)[e]	11 681	32.3	0.9 (0.5 to 1.3)[e]
I(a) Lymphoid leukemias	1247	18.7	−1.3 (−2.3 to −0.4)[e]	21 555	64.1	−0.1 (−0.6 to 0.4)	11 668	34.5	0.5 (−0.1 to 1.0)	7432	21.2	1.4 (0.7 to 2.1)[e]	6032	16.7	1.1 (0.4 to 1.8)[e]
I(b) Acute myeloid leukemias	1154	17.3	0.1 (−1.0 to 1.1)	3802	11.3	−0.2 (−0.8 to 0.4)	1381	4.1	−0.4 (−1.3 to 0.5)	2246	6.4	−0.2 (−1.2 to 0.7)	3045	8.4	−0.3 (−1.4 to 0.8)
I(c) Chronic myeloproliferative diseases	328	4.9	0.1 (−4.6 to 5.0)	630	1.9	−0.2 (−3.8 to 3.5)	359	1.1	−3.9 (−8.0 to 0.3)	722	2.1	0.2 (−1.7 to 2.1)	1729	4.8	1.0 (0.2 to 1.8)[e]
I(d) Myelodysplastic syndrome and other myeloproliferative diseases	436	6.5	0.2 (−2.9 to 3.5)	932	2.8	−1.8 (−2.7 to −0.9)[e]	250	0.7	−1.5 (−4.4 to 1.4)	295	0.8	−1.0 (−3.8 to 2.0)	408	1.1	0.5 (−1.9 to 3.0)
I(e) Unspecified and other specified leukemias	216	3.2	−1.6 (−3.5 to 0.4)	761	2.3	2.4 (0.9 to 3.9)[e]	429	1.3	6.7 (4.2 to 9.3)[e]	432	1.2	5.4 (3.0 to 7.9)[e]	467	1.3	3.3 (1.5 to 5.1)[e]
II Lymphomas and reticuloendothelial neoplasms	1105	16.5	7.2 (4.4 to 10.1)[e]	4707	14.0	2.5 (−1.1 to 6.2)	5793	17.1	1.6 (0.0 to 3.3)	9474	27.0	1.8 (1.2 to 2.4)[e]	18 334	50.7	0.4 (0.1 to 0.8)[e]
II(a) Hodgkin lymphomas	_[f]	_[g]	_[g]	255	0.8	_[g]	1324	3.9	−0.7 (−2.0 to 0.6)	4251	12.1	0.3 (−0.4 to 1.0)	11 489	31.8	−0.1 (−0.4 to 0.1)
II(b) Non-Hodgkin lymphomas (except Burkitt lymphoma)	179	2.7	_[g]	1426	4.2	0.7 (−0.4 to 1.8)	2357	7.0	1.5 (0.5 to 2.5)[e]	3424	9.8	1.5 (0.5 to 2.5)[e]	5393	14.9	0.9 (0.0 to 1.8)[e]
II(c) Burkitt lymphoma	7	0.1	_[g]	563	1.7	−0.6 (−2.1 to 0.9)	1034	3.1	−1.0 (−2.1 to 0.2)	949	2.7	0.2 (−1.2 to 1.5)	784	2.2	−0.3 (−1.5 to 0.8)
II(d) Miscellaneous lymphoreticular neoplasms	904	13.5	8.8 (4.6 to 13.2)[e]	2416	7.2	7.0 (−1.0 to 15.6)	1007	3.0	13.9 (0.9 to 28.6)[e]	756	2.2	_[g]	422	1.2	_[g]
II(e) Unspecified lymphomas	12	0.2	_[g]	47	0.1	_[g]	71	0.2	_[g]	94	0.3	_[g]	246	0.7	0.9 (−1.9 to 3.7)
III CNS and miscellaneous intracranial and intraspinal neoplasms	2271	34.0	−1.2 (−2.4 to 0.1)	14 015	41.7	−2.2 (−3.8 to −0.5)[e]	11 471	33.9	−2.0 (−3.3 to −0.7)[e]	9356	26.6	−0.8 (−2.7 to 1.0)	7788	21.6	−1.3 (−4.0 to 1.3)

ICCC group	Age <1 y			Age 0 to 4 y			Age 5–9 y			Age 10–14 y			Age 15–19 y		
	No.	Rate	AAPC[d] (95% CI)	No.	Rate	AAPC[d] (95% CI)	No.	Rate	AAPC[d] (95% CI)	No.	Rate	AAPC[d] (95% CI)	No.	Rate	AAPC[d] (95% CI)
III(a) Ependymomas and choroid plexus tumor	323	4.8	−1.0 (−3.7 to 1.7)	1729	5.2	0.4 (−1.1 to 2.0)	730	2.2	−0.7 (−2.6 to 1.3)	583	1.7	1.2 (−0.7 to 3.1)	576	1.6	−2.2 (−3.8 to −0.6)[e]
III(b) Astrocytomas	878	13.1	−1.5 (−3.6 to 0.6)	6631	19.7	−2.3 (−4.1 to −0.5)[e]	5694	16.8	−0.5 (−2.0 to 1.1)	5234	14.9	−0.1 (−1.7 to 1.5)	4456	12.3	0.0 (−1.0 to 1.0)
III(c) Intracranial and intraspinal embryonal tumors	741	11.1	−1.4 (−3.5 to 0.6)	3485	10.4	−2.5 (−5.6 to 0.7)	2330	6.9	−3.4 (−6.7 to 0.1)	1352	3.9	−3.6 (−9.2 to 2.4)	809	2.2	−3.0 (−5.3 to −0.6)[e]
III(d) Other gliomas	183	2.7	_[g]	1696	5.1	0.2 (−2.7 to 3.2)	2355	7.0	−2.5 (−7.0 to 2.3)	1831	5.2	1.2 (−0.2 to 2.5)	1566	4.3	0.8 (−0.9 to 2.4)
III(e) Other specified intracranial/intraspinal neoplasms	58	0.9	_[g]	255	0.8	0.1 (−2.9 to 3.1)	214	0.6	−1.5 (−4.2 to 1.2)	204	0.6	_[g]	235	0.7	−2.4 (−11.6 to 7.8)
III(f) Unspecified intracranial and intraspinal neoplasms	88	1.3	_[g]	219	0.7	0.9 (−2.4 to 4.3)	148	0.4	_[g]	152	0.4	0.2 (−3.3 to 3.8)	146	0.4	_[g]
IV Neuroblastoma and other peripheral nervous cell tumors	3961	59.3	0.1 (−0.6 to 0.8)	9758	29.1	0.0 (−0.5 to 0.5)	1352	4.0	1.5 (−1.0 to 4.0)	478	1.4	0.6 (−1.4 to 2.6)	319	0.9	3.0 (0.9 to 5.2)[e]
IV(a) Neuroblastoma and ganglioneuroblastoma	3949	59.1	0.1 (−0.6 to 0.8)	9713	29.0	0.0 (−0.5 to 0.6)	1317	3.9	2.4 (1.2 to 3.7)[e]	376	1.1	0.4 (−2.0 to 2.8)	169	0.5	_[g]
IV(b) Other peripheral nervous cell tumors	12	0.2	_[g]	45	0.1	_[g]	35	0.1	_[g]	102	0.3	_[g]	150	0.4	_[g]
V Retinoblastoma	1992	29.8	0.6 (−0.4 to 1.6)	4242	12.7	−0.3 (−1.4 to 0.7)	150	0.4	_[g]	25	0.1	_[g]	7	0.0	_[g]
VI Renal tumors	1057	15.8	−0.5 (−1.9 to 0.9)	6394	19.0	−0.9 (−1.8 to 0.0)	1958	5.8	1.4 (0.3 to 2.5)[e]	511	1.5	1.8 (0.2 to 3.5)[e]	643	1.8	1.3 (−0.5 to 3.0)
VI(a) Nephroblastoma and other nonepithelial renal tumors	1042	15.6	−0.7 (−2.0 to 0.7)	6342	18.9	−0.9 (−1.8 to 0.0)[e]	1841	5.4	1.7 (0.5 to2.8)[e]	276	0.8	2.0 (−0.8 to 4.9)	124	0.3	_[g]
VI(b) Renal carcinomas	8	0.1	_[g]	29	0.1	_[g]	106	0.3	_[g]	229	0.7	1.4 (−0.9 to 3.8)	511	1.4	2.2 (−0.2 to 4.6)
VI(c) Unspecified malignant renal tumors	7	0.1	_[g]	23	0.1	_[g]	11	0.0	_[g]	6	0.0	_[g]	8	0.0	_[g]
VII Hepatic tumors	864	12.9	1.7 (0.1 to 3.4)[e]	2379	7.1	1.7 (0.6 to 2.7)[e]	259	0.8	3.3 (1.3 to 5.3)[e]	288	0.8	0.4 (−2.5 to 3.4)	456	1.3	0.3 (−1.8 to 2.4)
VII(a) Hepatoblastoma	839	12.6	1.9 (0.3 to 3.6)[e]	2292	6.8	1.8 (0.7 to 2.9)[e]	150	0.4	_[g]	66	0.2	_[g]	14	0.0	_[g]

ICCC group	Age <1 y			Age 0 to 4 y			Age 5–9 y			Age 10–14 y			Age 15–19 y		
	No.	Rate	AAPC[d] (95% CI)	No.	Rate	AAPC[d] (95% CI)	No.	Rate	AAPC[d] (95% CI)	No.	Rate	AAPC[d] (95% CI)	No.	Rate	AAPC[d] (95% CI)
VII(b) Hepatic carcinomas	15	0.2	_[g]	72	0.2	_[g]	101	0.3	_[g]	214	0.6	_[g]	435	1.2	0.1 (−1.9 to 2.2)
VII(c) Unspecified malignant hepatic tumors	10	0.2	_[g]	15	0.0	_[g]	8	0.0	_[g]	8	0.0	_[g]	7	0.0	_[g]
VIII Malignant bone tumors	59	0.9	_[g]	511	1.5	0.6 (−1.5 to 2.8)	1939	5.7	1.0 (0.0 to 2.1)	4735	13.5	1.1 (0.5 to 1.6)[e]	5028	13.9	−0.4 (−1.0 to 0.2)
VIII(a) Osteosarcomas	_[f]	_[g]	_[g]	98	0.3	_[g]	1010	3.0	0.5 (−0.6 to 1.7)	2838	8.1	1.2 (0.4 to 2.1)[e]	2846	7.9	−1.1 (−1.9 to −0.2)[e]
VIII(b) Chondrosarcomas	_[f]	_[g]	_[g]	9	0.0	_[g]	31	0.1	_[g]	144	0.4	_[g]	279	0.8	−0.3 (−3.5 to 2.9)
VIII(c) Ewing tumor and related sarcomas of bone	36	0.5	_[g]	319	1.0	0.9 (−1.9 to 3.7)	752	2.2	1.4 (−0.6 to 3.4)	1465	4.2	0.8 (0.1 to 1.4)[e]	1495	4.1	0.5 (−0.7 to 1.8)
VIII(d) Other specified malignant bone tumors	8	0.1	_[g]	52	0.2	_[g]	105	0.3	_[g]	201	0.6	_[g]	293	0.8	−0.5 (−2.9 to 2.0)
VIII(e) Unspecified malignant bone tumors	10	0.2	_[g]	33	0.1	_[g]	41	0.1	_[g]	87	0.3	_[g]	115	0.3	_[g]
IX Soft tissue and other extraosseous sarcomas	1187	17.8	0.3 (−0.9 to 1.6)	4123	12.3	0.5 (−0.2 to 1.2)	2786	8.2	−0.1 (−0.9 to 0.7)	4052	11.5	0.2 (−0.4 to 0.9)	5496	15.2	−0.3 (−1.0 to 0.5)
IX(a) Rhabdomyosarcomas	370	5.5	0.3 (−1.5 to 2.2)	2417	7.2	0.3 (−0.6 to 1.3)	1477	4.4	−0.6 (−1.7 to 0.5)	1257	3.6	0.1 (−1.2 to 1.5)	1230	3.4	−0.6 (−2.0 to 0.9)
IX(b) Fibrosarcomas, peripheral nerve and other fibrous	329	4.9	0.0 (−3.0 to 3.1)	469	1.4	0.2 (−2.1 to 2.5)	194	0.6	−1.2 (−4.1 to 1.9)	397	1.1	−1.6 (−3.5 to 0.3)	634	1.8	−1.2 (−3.4 to 1.0)
IX(d) Other specified soft tissue sarcomas[h]	356	5.3	0 (−2.3 to 2.2)	933	2.8	0.9 (−0.7 to 2.6)	830	2.5	0.2 (−1.4 to 1.9)	1868	5.3	0.1 (−0.8 to 1.0)	2913	8.1	−0.4 (−1.3 to 0.6)
IX(e) Unspecified soft tissue sarcomas	132	2.0	_[g]	304	0.9	0.3 (−3.4 to 4.3)	285	0.8	1.9 (−0.5 to 4.4)	530	1.5	2.4 (0.6 to 4.3)[e]	719	2.0	1.7 (0.0 to 3.3)
X Germ cell tumors, trophoblastic tumors, and neoplasms of gonads	1299	19.4	−0.3 (−1.7 to 1.2)	2181	6.5	−0.1 (−1.0 to 0.8)	852	2.5	1.2 (−0.4 to 2.9)	2609	7.4	0.7 (−0.2 to 1.6)	9907	27.4	−0.3 (−1.5 to 0.9)
X(a) Intracranial and intraspinal germ cell tumors	135	2.0	_[g]	206	0.6	1.2 (−3.1 to 5.7)	393	1.2	1.7 (−1.1 to 4.5)	927	2.6	1.2 (−0.2 to 2.5)	853	2.4	0.8 (−0.4 to 2.0)
X(b) Extracranial and extragonadal germ cell tumors	869	13.0	0.2 (−1.3 to 1.7)	1276	3.8	−0.1 (−1.2 to 1.0)	41	0.1	_[g]	117	0.3	_[g]	566	1.6	−0.2 (−2.4 to 2.0)

ICCC group	Age <1 y			Age 0 to 4 y			Age 5–9 y			Age 10–14 y			Age 15–19 y		
	No.	Rate	AAPC[d] (95% CI)	No.	Rate	AAPC[d] (95% CI)	No.	Rate	AAPC[d] (95% CI)	No.	Rate	AAPC[d] (95% CI)	No.	Rate	AAPC[d] (95% CI)
X(c) Malignant gonadal germ cell tumors	281	4.2	−1.6 (−6.5 to 3.4)	669	2.0	−1.0 (−3.4 to 1.4)	361	1.1	0.5 (−1.7 to 2.7)	1359	3.9	0.5 (−0.6 to 1.6)	7683	21.3	−0.3 (−1.1 to 0.5)
X(d) Gonadal carcinomas	_f	_g	_g	6	0.0	_g	13	0.0	_g	92	0.3	_g	498	1.4	1.0 (−1.2 to 3.3)
X(e) Other and unspecified malignant gonadal tumors	12	0.2	_g	24	0.1	_g	44	0.1	_g	114	0.3	_g	307	0.9	0.5 (−1.7 to 2.7)
XI Other malignant epithelial neoplasms and melanomas	306	4.6	5.9 (2.5 to 9.5)[e]	792	2.4	2.3 (0.5 to 4.1)[e]	1468	4.3	1.3 (−0.3 to 2.8)	5903	16.8	3.6 (2.4 to 4.8)[e]	19 619	54.3	2.4 (1.2 to 3.7)[e]
XI(a) Adrenocortical carcinomas	31	0.5	_g	127	0.4	_g	27	0.1	_g	48	0.1	_g	86	0.2	_g
XI(b) Thyroid carcinomas	18	0.3	_g	88	0.3	_g	459	1.4	1.1 (−1.6 to 3.9)	2537	7.2	3.8 (2.9 to 4.7)[e]	9375	25.9	4.5 (3.8 to 5.2)[e]
XI(c) Nasopharyngeal carcinomas	_f	_g	_g	_f	_g	_g	27	0.1	_g	232	0.7	_g	485	1.3	−1.1 (−3.5 to 1.3)
XI(d) Malignant melanomas	167	2.5	_g	443	1.3	2.2 (0.0 to 4.5)[e]	497	1.5	−0.8 (−8.7 to 7.8)	1071	3.1	−3.4 (−4.9 to −1.9)[e]	4236	11.7	−5.4 (−6.2 to −4.6)[e]
XI(e) Skin carcinomas	_f	_g	_g	_f	_g	_g	11	0.0	_g	39	0.1	_g	65	0.2	_g
XI(f) Other and unspecified carcinomas	88	1.3	_g	131	0.4	_g	447	1.3	4.5 (2.0 to 7.1)[e]	1976	5.6	7.1 (3.9 to 10.4)[e]	5372	14.9	5.0 (2.7 to 7.3)[e]
XII Other and unspecified malignant neoplasms	154	2.3	_g	441	1.3	2.7 (0.4 to 5.2)[e]	106	0.3	_g	179	0.5	_g	442	1.2	−1.4 (−3.9 to 1.2)
XII(a) Other specified malignant tumors	78	1.2	_g	291	0.9	4.0 (1.2 to 6.8)[e]	35	0.1	_g	74	0.2	_g	179	0.5	_g
XII(b) Other unspecified malignant tumors	76	1.1	_g	150	0.5	_g	71	0.2	_g	105	0.3	_g	263	0.7	−1.9 (−4.8 to 1.0)
Not classified by ICCC or in situ	54	0.8	_g	254	0.8	_g	234	0.7	_g	167	0.5	_g	193	0.5	_g

[a]Rates are per 1 million people. Rates for ages <1 year, 5–9 years, 10–14 years, and 15–19 years are age specific, and the rates for ages 0 to 4 years are age adjusted to the 2000 US standard population (19 age groups—US Census P25–1130). Source: US Cancer Statistics. AAPC = average annual percent change; CI = confidence interval; CNS = central nervous system; ICCC = International Classification of Childhood Cancer.

[b]Cases included all malignant cancers.

[c]Incidence data are compiled from cancer registries that meet the data quality criteria for all years, 2003–2019 (covering 99.1% of the US population). Registry-specific data quality information is available at https://www.cdc.gov/cancer/uscs/technical_notes/criteria/index.htm. Characteristic values with other, missing, or blank results are not included in this table.

[d] Trends were measured with AAPC, and rates and were considered to increase or decrease if $P < .05$ (2-sided); otherwise, trends were considered stable. AAPC was not calculated if case count was <6 cases in any 1 year.

[e] Trends were significant at $P < .05$.

[f] Cell suppressed because there were <6 cases.

[g] Statistic could not be calculated because of the low number of cases.

[h] Includes IX(c) Kaposi sarcoma because of US Cancer Statistics complementary cell-suppression rules.