Childhood Cancer in California 1988 to 1999 Volume I: Birth to Age 14

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Childhood Cancer in California 1988 to 1999 Volume I: Birth to Age 14

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Contents

Overview of Childhood Cancer

Each year in California, over 1,000 children are diagnosed with cancer. Childhood cases represent just over one percent of all new invasive primary cancers diagnosed among California's residents, compared to the 70 percent of cases diagnosed in residents over age 60. [1, 2] Since 1988, the overall incidence rate of childhood cancer in California has declined, with a statistically significant estimated annual percent change (EAPC -1.0 p=0.004). However, NCI estimates that from 1973 to 1999, the incidence rate for all childhood cancers combined increased by 26 percent in children under age 15, with the greatest increase occurring prior to 1990, and leveling off or declining since then. [3]

Childhood cancer, like adult cancer, is not one disease, but a spectrum of different malignancies, varying by histology, anatomic site, race, sex, age, and risk factors. Childhood malignancies differ from adult tumors by common sites of origin, cell type, prognosis, and responsiveness to therapy. Primary epithelial tumors, originating from the cells covering internal or external body surfaces, predominate in adults which include cancer of the colon, lung, and breast. By comparison, childhood tumors, especially malignancies diagnosed prior to late adolescence, are usually of mesenchymal origin (embryonic connective tissue) or derive from the hematopoietic (blood forming) or central nervous systems.[4-6]

Development of cancer in adults has been linked to dietary, lifestyle, and other environmental factors. In contrast, few definitive relationships have been identified for childhood malignancies. The few established environmental links to childhood malignancies include radiation, chemotherapeutic agents, and other medications. Other suspected and more frequently debated potential carcinogenic factors include electromagnetic fields (EMFs), pesticides, environmental tobacco smoke, and parental occupational exposures.[4-6]

Although underlying inherited disorders are rare in childhood cancer, certain genetic disorders or constitutional syndromes appear to increase risk for a limited number of tumor types. A large number of syndromes have been linked to a range of pediatric cancers. Examples include xeroderma pigmentosum with carcinoma and melanoma of the skin; neurofibromatosis with neuroblastoma, leukemia, rhabdomyosarcoma, neurosarcoma, brain, and Wilms' tumors; and Bloom syndrome with leukemia, lymphoma, colon, and squamous cell carcinoma.[4-6]

Recognition that genetic factors, prenatal, postnatal, and childhood exposures together influence the risk of developing malignancies highlights the importance of understanding all the types of risk factors so that better prevention and treatment strategies can be developed.

Technical Notes

Following a brief summary of the overall childhood cancer incidence in California, this report describes the major diagnostic categories of cancer diagnosed in the state's children during the 12-year period, 1988 to 1999. In this report, the terms children and childhood refer to the age range from birth through 14 years. The appendices include summarized tabulations of the frequencies of various types of cancer incidence by age, sex, and race/ethnicity.

Reporting of all newly diagnosed cancers in California has been legislatively mandated since 1985, with statewide population-based reporting fully implemented by January 1988. A "case" is defined as a primary cancer, as distinguished from cancer spread from another site or surrounding tissue. All reported cancers are invasive, e.g., have infiltrated the surrounding tissue or basement membrane. Data in this report cover the years 1988 through 1999, representing the time since population-based cancer reporting was initiated statewide, and reported to CCR as of August 2001. Only cases diagnosed among state residents are included in this report.

Malignancies in this report are classified according to the International Classification of Childhood Cancer (ICCC) scheme (Appendix A). The ICCC system classifies cancer into one of 12 major diagnostic groups. Each of these categories is further refined into 48 diagnostic subgroups based on tumor histology and anatomic site.[7] CCR generally does not collect information on benign tumors or tumors with uncertain malignancy. Therefore, ICCC categories that include such cases will be underrepresented in the CCR file to an unknown extent. [Recently, legislative authority for the collection of benign (in situ) brain tumors was granted to CCR with cases diagnosed as of January 1, 2001.] Detailed summary tables of cancer incidence by age, sex, and race/ethnicity are presented in Appendices B and C for the major ICCC categories.

Annual mid-year population estimates by age, race/ethnicity, and sex were obtained from the California Department of Finance (DOF) Demographic Research Unit.[8-10] Race/ethnicity is grouped into mutually exclusive categories of non-Hispanic white, non-Hispanic black, Hispanic, and Asian/Pacific Islander. Although cancer cases are reported with more detailed race classifications, aggregation into these broader categories matches the race/ethnic categories for DOF population estimates produced during periods between decennial censuses.

Average Annual Age-Specific Rate: Age-specific rates were calculated by dividing the number of cases over the six- or twelve-year period in the age group of interest by the sum of the mid-year population estimates over the same time period in the corresponding age group of interest (by sex, race/ethnicity). Age-specific rates are presented per 100,000 persons.[11]

Average Annual Age-Adjusted Rate: Age-adjusted rates are a weighted average of the age-specific rates, where rates represent the age distribution of a standard population. All rates in this report are age-adjusted by the direct method to the 2000 U.S. Standard Population and are calculated per 100,000 persons. Age-adjustment allows meaningful comparisons of cancer risk by controlling for differences in the age distribution of two populations under comparison.[11]

Estimated Annual Percent Change (EAPC): EAPC determines the degree a rate has increased or decreased over a time period (trend). EAPC was calculated by fitting a linear regression line to the natural logarithm of the rates by calendar year for the 12-year period 1988 to 1999. A trend was determined to be substantial if the slope of the regressed line is statistically different from zero ($p<0.05$).[11]

Childhood Cancer Incidence in California

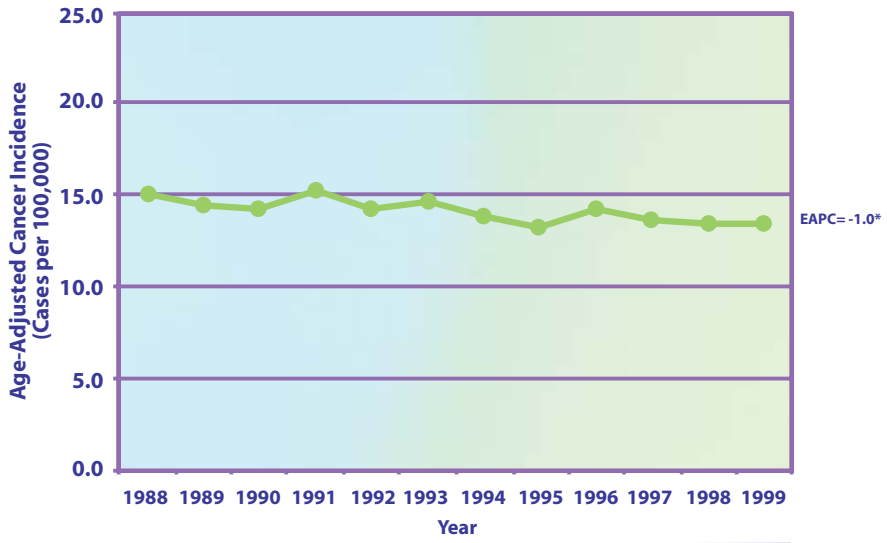
This report summarizes the status of cancer in California's children based on the 12,707 invasive, primary cancer cases diagnosed among residents under age 15 initially diagnosed from January 1, 1988, through December 31, 1999, and reported to CCR as of August 2001. In this 12-year period, on average, over 1,000 cases of invasive primary cancer were diagnosed annually among children under age 15. For the most recent six-year period, 1994 to 1999, the average annual age-adjusted rate was 13.59 new cases per 100,000 children under age 15. Diversity in both the specific types of, and incidence rates for, common childhood cancers vary by age, sex, and race/ethnicity.

General Trends

The overall incidence of childhood cancer in California has remained relatively steady since the onset of statewide cancer surveillance, actually averaging a one percent annual decline (p=0.004) since 1988, decreasing a total of 8.5 percent (Figure 1). Age-adjusted incidence for all cancer sites combined declined in both males (EAPC -0.8 p=0.02) and females (EAPC -1.1 p=0.002) under age 15. Similar downward trends occurred in age-specific incidence rates within each five-year age group, birth to 4 (EAPC -1.1 p=0.004), 5 to 9 (EAPC -1.0 p=0.06), and 10 to 14 years of age (EAPC -0.8 p=0.09) (Figure 2).

Figure 1

Trend in the Annual Age-Adjusted Cancer Incidence Among California Children Under Age 15, Both Sexes and All Races Combined (1988-1999)



*Statistically Significant Trend p<0.01

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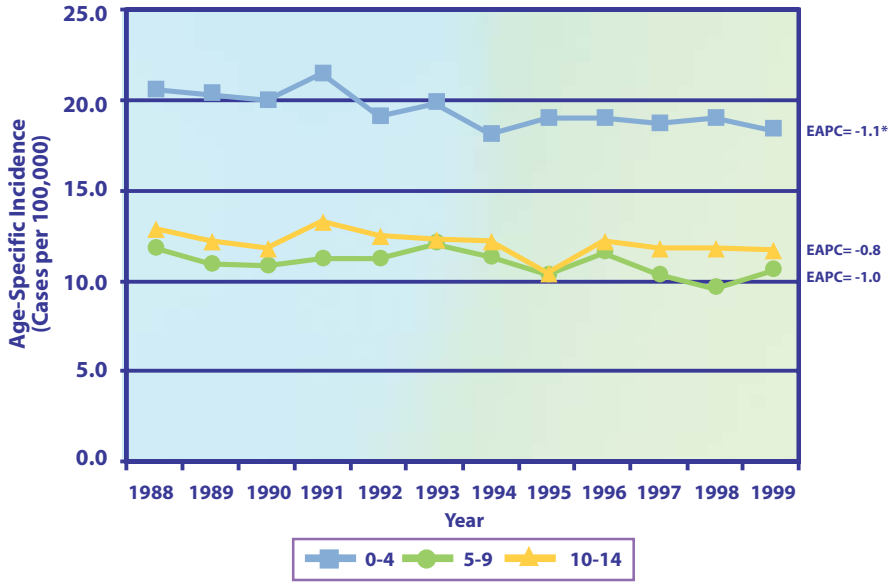
Figure 2

Trends in the Annual Age-Specific Cancer Incidence in California Children, Ages Birth to 14, Both Sexes and All Races Combined (1988-1999)



*Statistically Significant Trend p<0.01

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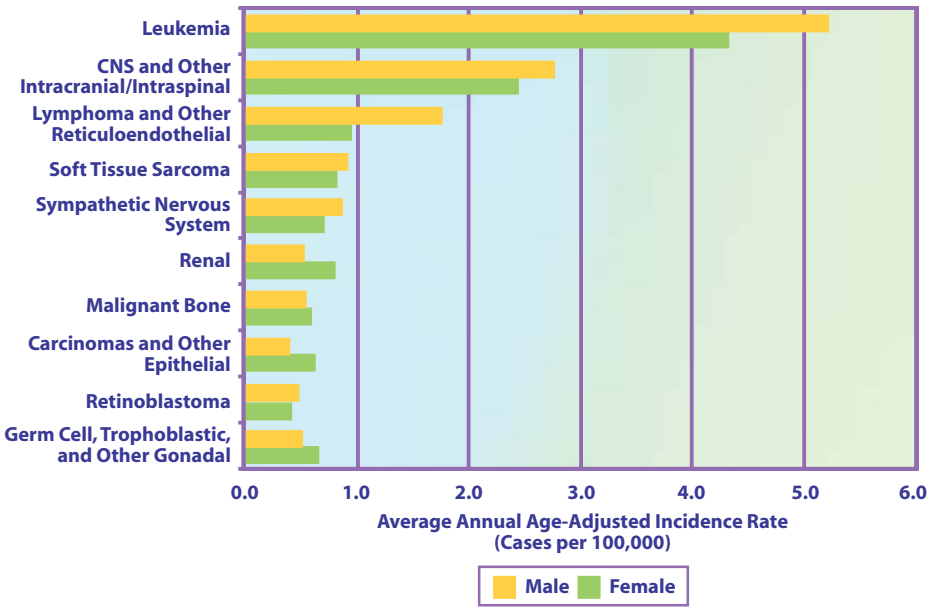
Figure 3

Ten Most Common Cancers in California Children, Ages Birth to 14, by ICCC Diagnostic Category and Sex, All Races Combined (1994-1999)



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Common Sites

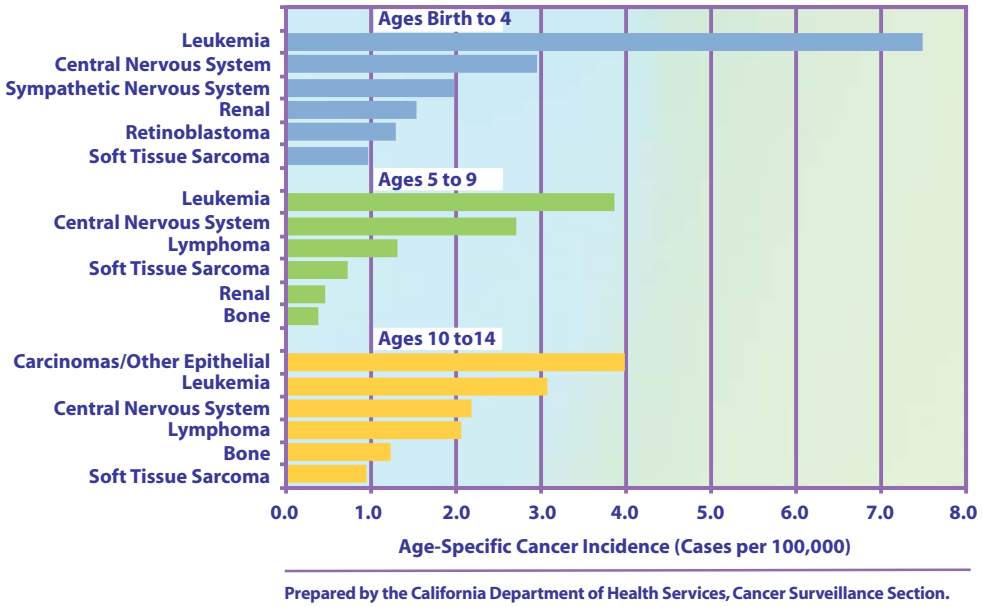
Figure 3 presents the ten most commonly diagnosed invasive cancers by ICCC diagnostic category among children under age 15. These ten cancer categories represent 98 percent of all primary childhood cancers diagnosed during the 12-year period, 1988 to 1999. In California, as throughout the U.S., the most common cancers diagnosed among children under age 15 were leukemias, lymphomas, and malignant tumors of the central nervous system (CNS), accounting for approximately 64 percent of all childhood cancers diagnosed. Other common types of childhood cancer include bone and soft tissue sarcomas, neuroblastoma (a tumor of the sympathetic nervous system), Wilms' tumor (a form of kidney cancer), germ cell tumors (a tumor derived from embryonic and related tissues), and retinoblastoma (a tumor of the eye).

Age

At 18.68 cases per 100,000 males and females, respectively, birth to 4 year-olds had the highest overall age-specific cancer incidence in California's population prior to adulthood. These age-specific incidence rates drop for 5 to 9 year-olds (10.63 cases per 100,000) and begin to rise in 10 to 14 year-olds (11.72 cases per 100,000). Overall rates steadily continue upward through late adolescence and adulthood.

Figure 4

Average Annual Age-Specific Incidence of Major Childhood Cancers in California, Ages Birth to 14, by ICCC Diagnostic Category and Age Group, Both Sexes and All Races Combined (1994-1999)



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The age-dependent variation in cancer frequencies becomes apparent in the age-specific incidence rates by ICCC category. Figure 4 illustrates both the classic peak in incidence within these youngest age groups for leukemia, and tumors of the CNS, eye (retinoblastoma), kidney (renal), and soft tissues; and the later age-related rise in the incidence of lymphomas, bone, and epithelial tumors.

Sex

For all cancer sites combined, cancer occurs slightly more frequently among males than females (Figure 5). In California, the annual age-adjusted overall cancer incidence by sex (all races combined) was 14.40 cases per 100,000 males versus 12.75 cases per 100,000 females. This gender difference was highest among the youngest children: ages birth to 4, 20.17 and 17.11 cases per 100,000; ages 5 to 9, 11.57 and 9.64 cases per 100,000 children, males and females, respectively. By later childhood, ages 10 to 14, age-specific rates between males and females were nearly equal, 11.73 and 11.71 cases per 100,000, respectively.

Also, within the majority of individual ICCC diagnostic categories, cancer incidence was higher among males than females. However, as will be discussed in the following sections, some specific cancer types (anatomic sites and/or histologies) have a female predominance, specifically, rates for renal, germ cell, and epithelial cancers where incidence was higher in California females than males (Figure 4).

Figure 5

Average Annual Age-Adjusted Incidence of Childhood Cancer in California, Ages Birth to 14, by Race/Ethnicity and Sex (1994-1999)

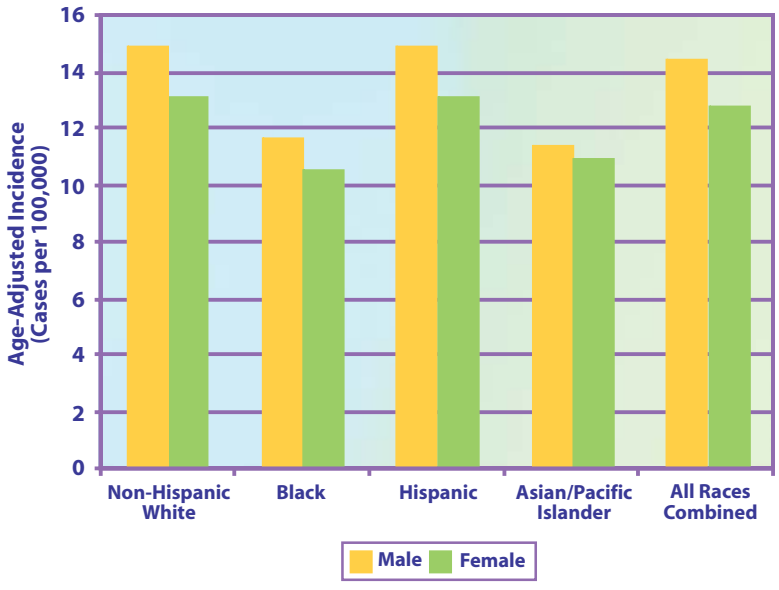

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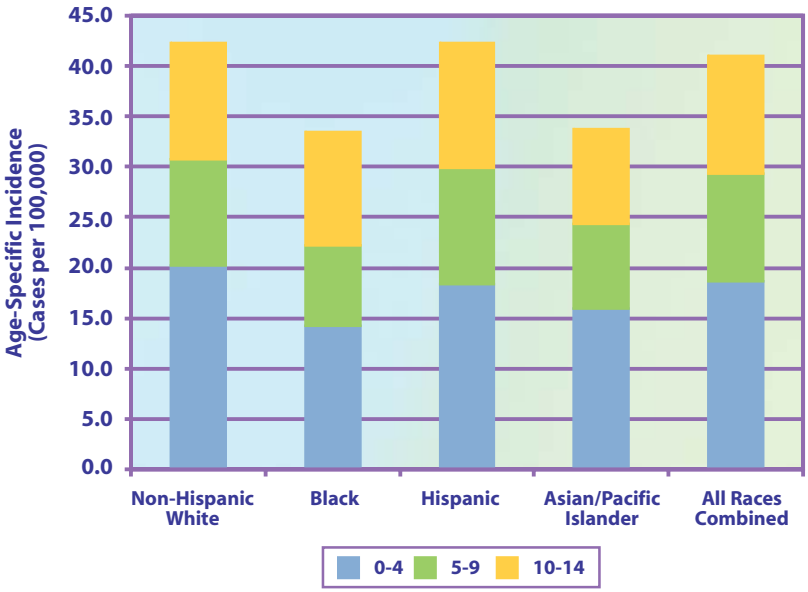
Figure 6.
Average Annual Age-Specific Incidence of Childhood Cancer by Race/Ethnicity in California, Ages Birth to 14, Both Sexes Combined (1994-1999)



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Race/Ethnicity

In California, the incidence of childhood cancer varies by race/ethnicity. Among males under age 15, Hispanics and non-Hispanic whites at 14.92 and 14.87 cases per 100,000, respectively, had the highest overall age-adjusted cancer incidence, followed by children identified as black (11.64 cases per 100,000) and Asian/Pacific Islander (11.40 cases per 100,000) (Figure 5). Although accounting for a relatively lower overall cancer incidence, females demonstrated a similar incidence pattern with Hispanics and non-Hispanic whites having the highest age-adjusted incidence rates at 13.12 and 13.06 cases per 100,000, respectively, followed by lower rates in Asian/Pacific Islanders (10.88 cases per 100,000) and blacks (10.55 cases per 100,000).

Although the overall, age-adjusted incidence for all cancer types combined was nearly equal between Hispanic and non-Hispanic white children (14.04 and 13.99 cases per 100,000), larger age-specific differences exist, with non-Hispanic white incidence higher in children under age 5 (20.21 versus

18.38 cases per 100,000), but Hispanic rates were greater in children ages 5 through 14 (11.53 and 12.41 cases per 100,000 5 to 9 and 10 to 14 year-olds), respectively (Figure 6). Age-specific incidence rates among children identified as non-Hispanic black or Asian/Pacific Islander were generally lower compared to those for non-Hispanic whites in all age groups (Table 1).

As detailed in Appendix C, several race-specific incidence rates were based on a small number of cases, especially rates for children classified as non-Hispanic black or Asian/Pacific Islander, and should be noted with caution due to the increased volatility in rates based on smaller case numbers.

Organization of Report

This report briefly summarizes the incidence of the major types of pediatric cancer diagnosed in California children under age 15. Individual sections are presented for the most commonly occurring cancers as categorized by ICCC scheme. Each section describes the California specific cancer incidence including variation by age, sex, and race/ethnicity.

Table 1

Average Annual Age-Specific Cancer Incidence for All Sites Combined in California Children, Ages Birth to 14, by Age Group, Sex and Race/Ethnicity (1994-1999)

		0-4 Years			5-9 Years			10-14 Years		
		Cases	ASIR	SE	Cases	ASIR	SE	Cases	ASIR	SE
All Races Combined	Male	1,748	20.17	0.48	959	11.57	0.37	840	11.73	0.40
	Female	1,416	17.11	0.45	762	9.64	0.35	800	11.71	0.41
	Total	3,164	18.68	0.33	1,721	10.63	0.26	1,640	11.72	0.29
Non-Hispanic White	Male	687	21.79	0.83	404	11.72	0.58	368	11.45	0.60
	Female	554	18.54	0.79	308	9.45	0.54	348	11.46	0.61
	Total	1,241	20.21	0.57	712	10.62	0.40	716	11.46	0.43
Black	Male	93	14.92	1.55	53	8.23	1.13	66	11.92	1.47
	Female	81	13.41	1.49	49	7.80	1.11	57	10.58	1.40
	Total	174	14.18	1.07	102	8.02	0.79	123	11.26	1.02
Hispanic	Male	787	20.10	0.72	415	12.69	0.62	310	12.23	0.69
	Female	625	16.60	0.66	324	10.33	0.57	307	12.61	0.72
	Total	1,412	18.38	0.49	739	11.53	0.42	617	12.41	0.50
Asian-Pacific Islander	Male	154	16.50	1.33	76	8.61	0.99	76	9.34	1.07
	Female	135	15.36	1.32	68	8.12	0.99	73	9.38	1.10
	Total	289	15.95	0.94	144	8.37	0.70	149	9.36	0.77

Cases=Number of new primary malignant cases initially diagnosed between January 1, 1994, and December 31, 1999, reported to CCR as of August 2001.
Age-specific incidence rate (ASIR)=Average annual age-specific incidence for the six-year period, 1994-1999, reported as cases per 100,000.
SE=Standard error for the ASIR or Age-adjusted incidence rate (AAIR).
Prepared by the California Department of Health Services, Cancer Surveillance Section.

Major Childhood Cancers

Leukemia (ICCC I)

Leukemia accounts for the largest number of childhood cancers diagnosed among children under age 15 across California, 36 percent of all cancer cases during the most recent six-year period, 1994 to 1999.

Each year approximately 390 children under 15 are diagnosed with any form of leukemia, with the major type being acute lymphocytic leukemia (ALL), 79 percent, and acute non-lymphocytic leukemia (ANLL), 15 percent.

Leukemia peaks between two and four years of age, accounting for 40 percent of cancer diagnosed in children under five, but 36 percent and 26 percent of all malignancies among children aged 5 to 9 and 10 to 14, respectively.

Hispanics have the highest age-adjusted rates (5.62 cases per 100,000), followed by rates in non-Hispanic whites (4.46 cases per 100,000) and Asian/Pacific Islanders (4 cases per 100,000), with the lowest rates reported among non-Hispanic blacks (2.91 cases per 100,000).

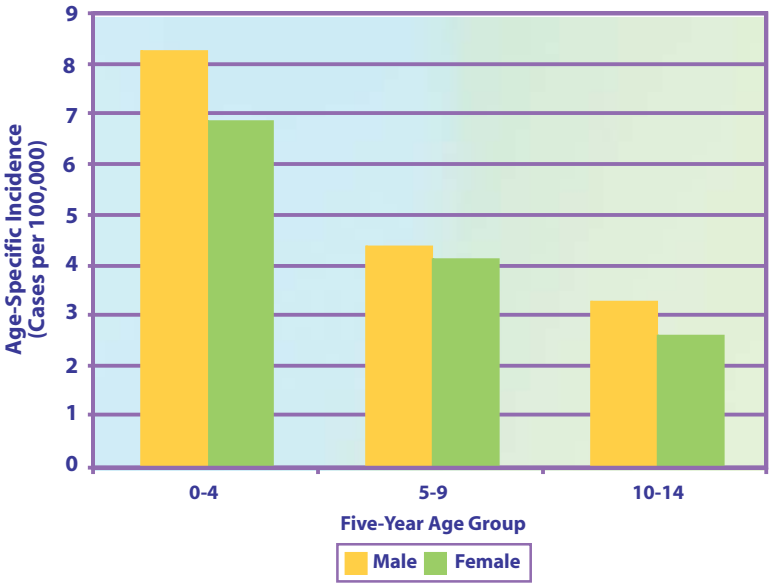
The overall incidence of childhood leukemia in California has remained relatively steady since the onset of statewide cancer surveillance, with a slight, nonsignificant decline since 1988 (EAPC -0.5 p=0.50). A similar negative trend occurred for the most common leukemia, ALL (EAPC -0.7 p=0.45).

Leukemia (ICCC I)

Leukemia, or malignancy of the blood-forming hematopoietic system, accounts for the largest number of childhood cancers diagnosed among children under age 15 across California. During the most recent six-year period, 1994 to 1999, 2,333 children under 15 were diagnosed with any form of leukemia, making up 36 percent of all malignancies diagnosed in this age group. However, the relative occurrence of leukemia does vary by age (Figure 7). Leukemia peaks between 2 and 4 years of age, accounting for 40 percent of cancer diagnosed in children under 5, but 37 percent and 26 percent of all malignancies among children aged 5 to 9 and 10 to 14, respectively.

Figure 7

Average Annual Age-Specific Incidence of Childhood Leukemia in California, Ages Birth to 14, by Sex, All Races Combined (1994-1999)



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The ICCC scheme divides leukemia into one of five diagnostic subcategories according to the type of white blood cell involved: lymphoid leukemia (LL), ANLL, chronic myeloid leukemia (CML), other specified leukemias, and unspecified leukemias. LL is almost entirely composed of ALL (over 99 percent of the reported cases) and is the most frequently occurring childhood malignancy. ANLL, or acute myelogenous leukemia, is the second most common childhood leukemia and the most common congenital leukemia (diagnosed in the first month of life). CML cases diagnosed in early childhood often vary histologically from later adolescent and adult cases.

Leukemia incidence varies substantially by age, sex, and race/ethnicity (Table 2, Figures 8 through 10). Overall, incidence was highest among the youngest age group birth to 4 years, 8.23 and 6.80 cases per 100,000, males and females, respectively, declining with age until late adolescence. Regardless of age, leukemia occurs more frequently in males relative to females (Figure 8).

Leukemia incidence also varied substantially between the four major race/ethnicity groups, with Hispanics having the highest age-adjusted rates (5.62 cases per 100,000), followed by rates in non-Hispanic whites (4.46 cases per 100,000) and Asian/Pacific Islanders (4.00 cases per 100,000), with the lowest rates reported among non-Hispanic blacks (2.91 cases per 100,000) (Figure 8). In the youngest age group, ages birth to 4, age-specific incidence was higher in Hispanic males (9.02 cases per 100,000), but not females (7.14 cases per 100,000), relative to non-Hispanic whites (7.86 and 7.36 cases per 100,000, males and females, respectively). However, in older children, ages 5 to 9 and 10 to 14, rates among both male and female Hispanics were higher than comparable non-Hispanic white rates (Table 2).

Table 2
Average Annual Age-Specific Leukemia Incidence in California Children, Ages Birth to 14, by Age Group, Sex, and Race/Ethnicity (1994-1999)

		0-4 Years			5-9 Years			10-14 Years		
		Cases	ASIR	SE	Cases	ASIR	SE	Cases	ASIR	SE
All Races Combined	Male	713	8.23	0.31	360	4.34	0.23	231	3.23	0.21
	Female	563	6.80	0.29	268	3.39	0.21	198	2.90	0.21
	Total	1,276	7.53	0.21	628	3.88	0.15	429	3.07	0.15
Non-Hispanic White	Male	248	7.86	0.50	134	3.89	0.34	89	2.77	0.29
	Female	220	7.36	0.50	89	2.73	0.29	73	2.40	0.28
	Total	468	7.62	0.35	223	3.33	0.22	162	2.59	0.20
Black	Male	31	4.97	0.89	11	--	--	16	2.89	0.72
	Female	17	2.81	0.68	15	2.39	0.62	15	2.78	0.72
	Total	48	3.91	0.56	26	2.04	0.40	31	2.84	0.51
Hispanic	Male	353	9.02	0.48	186	5.69	0.42	101	3.98	0.40
	Female	269	7.14	0.44	133	4.24	0.37	94	3.86	0.40
	Total	622	8.10	0.32	319	4.98	0.28	195	3.92	0.28
Asian-Pacific Islander	Male	71	7.61	0.90	26	2.95	0.58	24	2.95	0.60
	Female	50	5.69	0.80	28	3.35	0.63	13	--	--
	Total	121	6.68	0.61	54	3.14	0.43	37	2.32	0.38

Cases=Number of new primary malignant cases initially diagnosed between January 1, 1994, and December 31, 1999, reported to CCR as of August 2001.
Age-specific incidence rate (ASIR)=Average annual age-specific incidence for the six-year period, 1994-1999, reported as cases per 100,000. SE=Standard error for the ASIR.
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Figure 8

Average Annual Age-Specific Incidence of Leukemia in California Children, by Age and Race/Ethnicity, Ages Birth to 14, Both Sexes Combined (1994-1999)

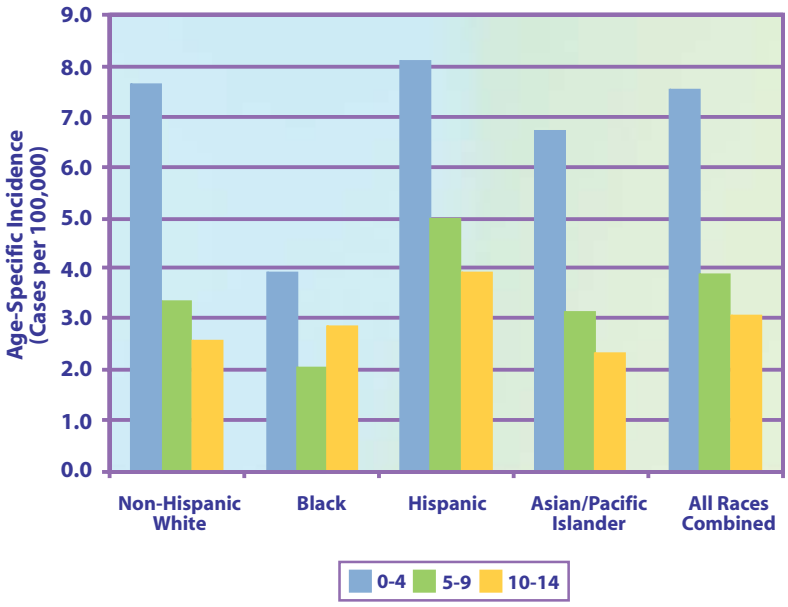

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Figure 9

Histological Distribution of Childhood Leukemia Incidence in California, Ages Birth to 14, by ICCC Category and Age, Both Sexes and All Races Combined (1994-1999)

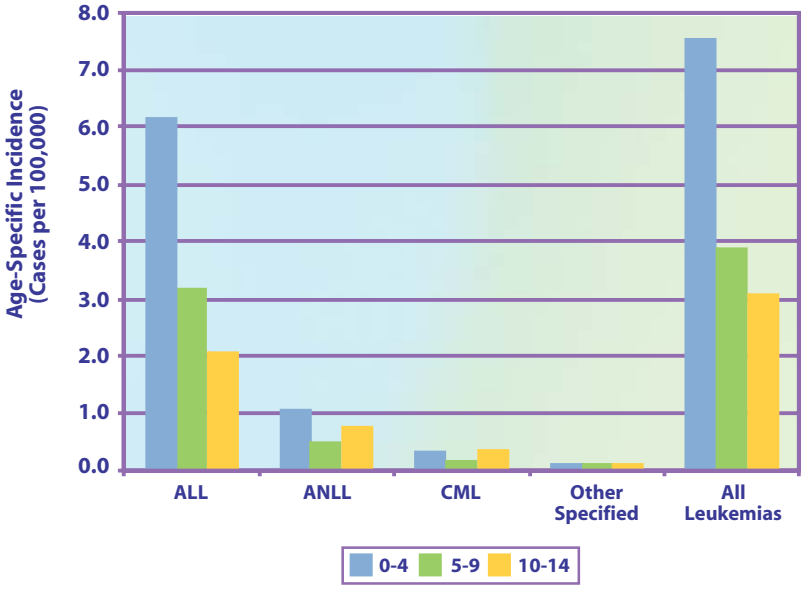

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Figure 10

Average Annual Age-Adjusted Incidence of Leukemia in California Children, by ICCC Category and Race/Ethnicity, Ages Birth to 14, Both Sexes Combined (1994-1999)

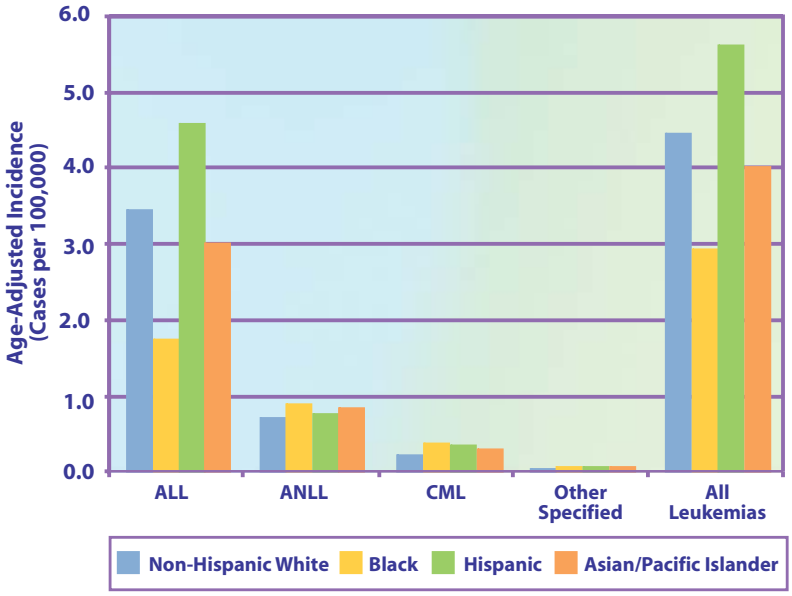

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Figure 11

Trends in Age-Specific Leukemia Incidence in California Children, Ages Birth to 14, All Races and Both Sexes Combined (1988-1999)

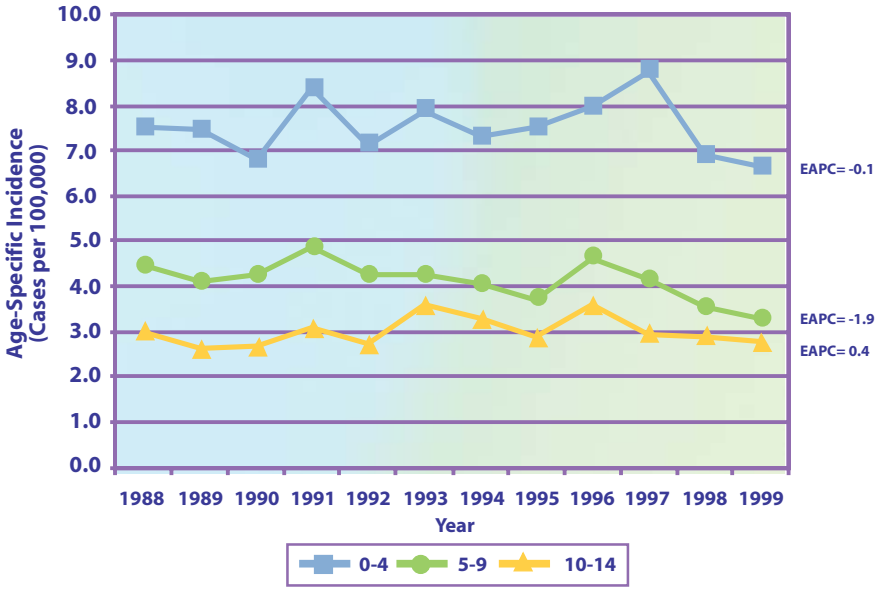

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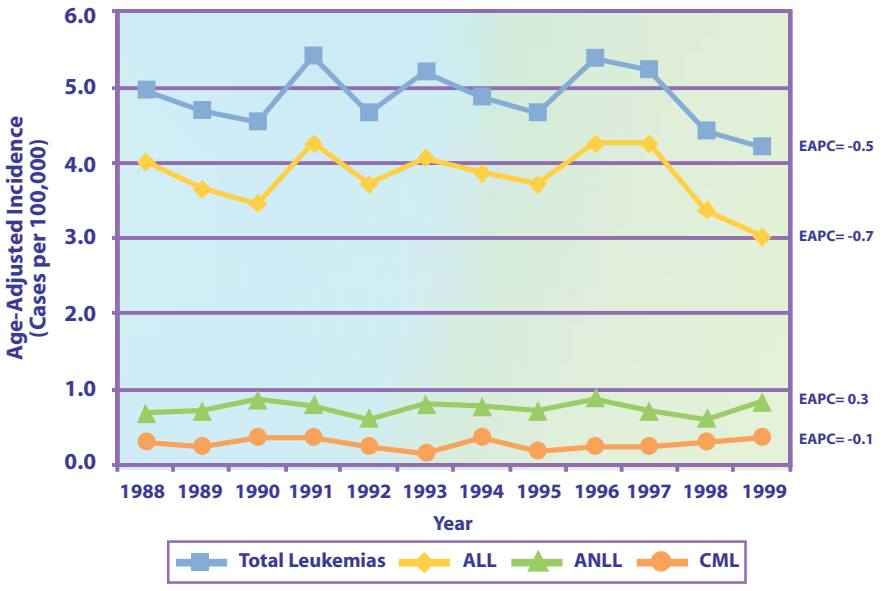
Figure 9 presents the age-specific incidence for all leukemia and by major ICCC diagnostic categories for each five-year age group. ALL accounted for the majority of leukemia cases in all age groups, but with the relative proportion declining with age. Incidence of ANLL and CML decreases after age four (initial childhood peak around age two), but begins to increase again in later adolescence. For the most common leukemia, ALL, age-adjusted incidence rates were higher among Hispanics (4.59 cases per 100,000), followed by rates in non-Hispanic whites (3.45 cases per 100,000), and Asian/Pacific Islanders (2.99 cases per 100,000) (Figure 10).

The overall incidence of childhood leukemia in California has remained relatively steady since the onset of statewide cancer surveillance, with a slight, nonsignificant decline since 1988 (EAPC -0.5 p=0.50) (Figure 11). Similar slightly downward trends occurred in age-specific incidence rates for children under age ten, and a relatively steady incidence among children 10 to 14 years of age, with no statistically significant estimated trend in annual age-specific incidence for any age group. Similarly, no statistically significant trends were observed in age-adjusted incidence rates for all leukemia or by major subtype (Figure 12).

Figure 12

Trends in Childhood Leukemia Incidence by ICCC Category, Ages Birth to 14, in California, All Races and Both Sexes Combined (1988-1999)



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Lymphoma and Other Reticuloendothelial Neoplasms (ICCC II)

Lymphomas account for nearly nine percent of all childhood cancers diagnosed among children under age 15 in California during 1994 to 1999.

Each year approximately 100 children under 15 are diagnosed with any form of lymphoma, with the predominate types being Hodgkin's Disease, 0.52 cases per 100,000, and non-Hodgkin's lymphomas (NHL), 0.56 cases per 100,000 (age-adjusted incidence).

For Hodgkin's disease, Hispanics have the highest age-adjusted rates (0.62 cases per 100,000), followed by non-Hispanic whites (0.49 cases per 100,000). By comparison, NHL incidence was higher in blacks (0.80 cases per 100,000) and non-Hispanic whites (0.60 cases per 100,000).

In California children under age 15, the age-adjusted incidence rate for all lymphomas, as well as Hodgkin's disease and non-Hodgkin's lymphomas separately, decreased slightly since 1988 (overall EAPC -1.4 p=0.06).

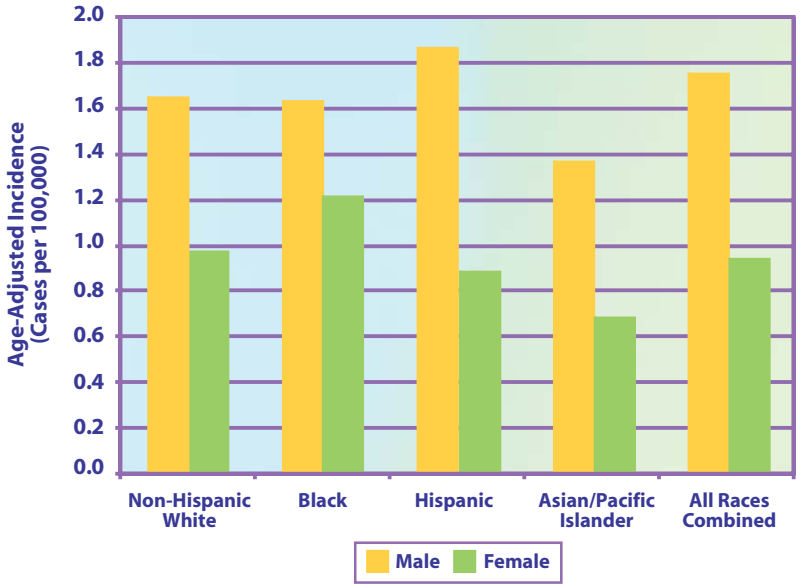
Lymphoma and Other Reticuloendothelial Neoplasms (ICCC II)

Lymphomas, malignancies of the lymphoid cells, constitute the third most common malignancy in children, after leukemia and malignant brain tumors. Childhood lymphomas differ from the common adult lymphomas (low and intermediate grade), and are divided into two general types, Hodgkin's disease and NHL. Childhood NHLs include lymphoblastic lymphoma, small noncleaved cell lymphoma (Burkitt's and Burkitt's-like lymphoma), and large cell lymphoma (anaplastic and diffuse large B-cell).

From 1988 to 1999, 1,196 cases of lymphoma were diagnosed in California children under age 15, representing an age-adjusted incidence rate of 1.35 cases per 100,000 for the most recent six-year period, 1994 to 1999. Lymphoma incidence increases with age, with the majority occurring in older children (after age nine), then increasing throughout adolescence. Regardless of age, lymphoma occurs more frequently in males relative to females (Figures 13), with the sex difference greatest in children under age ten, for both Hodgkin's disease and NHL.

Figure 13

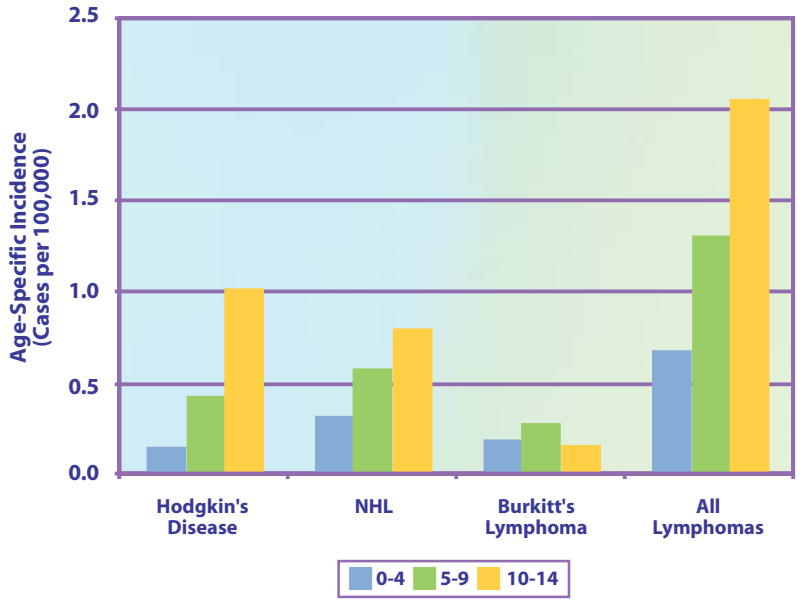
Average Annual Age-Adjusted Incidence of Childhood Lymphoma in California Children, Ages Birth to 14, by Sex and Race/Ethnicity (1994-1999)



Prepared by the California Department of Health Services, Cancer Surveillance Section.

Figure 14

Histological Distribution of Childhood Lymphoma Incidence in California, Ages Birth to 14, by ICCC Category and Age, Both Sexes and All Races Combined (1994-1999)



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During the most recent five-year period, 1994 to 1999, age-adjusted incidence varied by race/ethnicity, with Hodgkin's disease higher in Hispanics (0.62 cases per 100,000) compared to non-Hispanic whites (0.49 cases per 100,000), or blacks (0.46 cases per 100,000). In contrast, NHL incidence was higher among blacks and non-Hispanic whites (0.80 and 0.60 cases per 100,000) relative to rates among Hispanics or Asian/Pacific Islanders. However, several rates were based on a limited number of cases (<6 per year) (Table 3).

Table 3
Average Annual Age-Adjusted Lymphoma Incidence in California Children, Ages Birth to 14, by Sex and Race/Ethnicity (1994-1999)

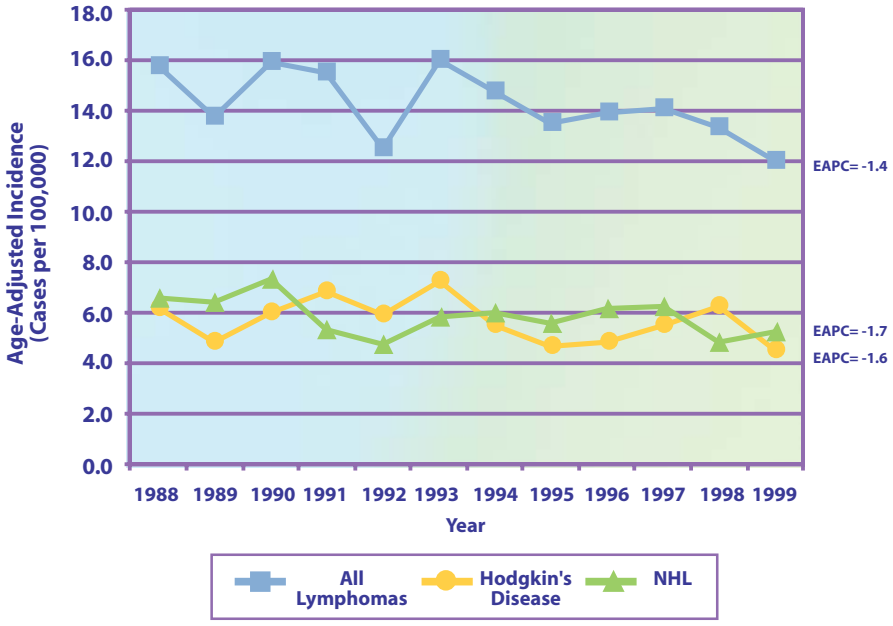
		Hodgkin's Disease 0-14 Years			Non-Hodgkin's 0-14 Years			Burkitt's Lymphoma 0-14 Years		
		Cases	AAIR	SE	Cases	AAIR	SE	Cases	AAIR	SE
All Races Combined	Male	139	0.61	0.05	177	0.76	0.06	73	0.30	0.04
	Female	87	0.42	0.04	80	0.36	0.04	24	0.10	0.02
	Total	226	0.52	0.03	257	0.56	0.04	97	0.20	0.02
Non-Hispanic White	Male	50	0.52	0.07	78	0.80	0.09	29	0.29	0.05
	Female	41	0.46	0.07	37	0.40	0.07	10	--	--
	Total	91	0.49	0.05	115	0.60	0.06	39	0.20	0.03
Black	Male	6	--	--	19	1.06	0.24	<5	--	--
	Female	9	--	--	9	--	--	<5	--	--
	Total	15	0.46	0.12	28	0.80	0.15	<5	--	--
Hispanic	Male	72	0.82	0.10	59	0.65	0.09	30	0.29	0.05
	Female	33	0.41	0.07	25	0.28	0.06	12	--	--
	Total	105	0.62	0.06	84	0.47	0.05	42	0.22	0.03
Asian-Pacific Islander	Male	8	--	--	16	0.63	0.16	10	--	--
	Female	<5	--	--	8	--	--	<5	--	--
	Total	9	--	--	24	0.49	0.10	12	--	--

Cases=Number of new primary malignant cases initially diagnosed between January 1, 1994, and December 31, 1999, reported to CCR as of August 2001.
Age-adjusted incidence rate (AAIR)=Average annual age-adjusted incidence for the six-year period, 1994-1999, as cases per 100,000, adjusted to the 2000 U.S. Standard.
SE=Standard error for the AAIR.
Prepared by the California Department of Health Services, Cancer Surveillance Section.

In children under age 15, the age-adjusted incidence rate for lymphomas decreased slightly (not statistically significant) since 1988 (EAPC -1.4 p=0.06). This decline occurred for all lymphomas combined, and both Hodgkin's disease and NHL separately (Figure 15).

Figure 15

Trends in Age-Adjusted Incidence of Hodgkin's Disease and NHL in California Children, Ages Birth to 14, All Races and Both Sexes Combined (1988-1999)



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Central Nervous System and Miscellaneous Intracranial and Intraspinal Neoplasms (ICCC III)

Malignant tumors of the CNS represented 20 percent of all childhood malignancies diagnosed in California children under age 15, averaging over 200 new cases annually.

CNS tumors remain the second most common malignancy of childhood, with gliomas, particularly astrocytoma, accounting for the majority of cases, 51 percent.

Age-adjusted incidence was higher in males than females, 2.77 and 2.44 cases per 100,000, respectively; and, in younger (< 5 years) than older children (6 to 14 years).

Overall incidence of invasive CNS tumors was highest in non-Hispanic whites and blacks, but relative age-adjusted incidence varied by tumor subtype.

In California children under age 15, the AAIR for all CNS tumors combined, and the majority of diagnostic subtypes, decreased since 1988 (overall EAPC -1.3 p=0.10); however, a slight, statistically nonsignificant, increase occurred in other gliomas (excludes astrocytoma).

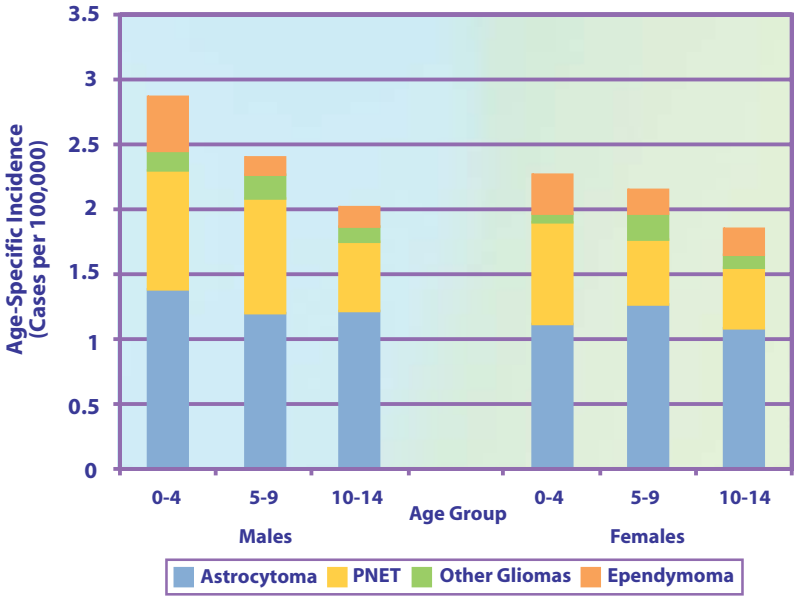
Central Nervous System and Miscellaneous Intracranial and Intraspinal Neoplasms (ICCC III)

CNS tumors are the second most common malignancy in children under age 15 accounting for almost 20 percent of all diagnoses. The majority of CNS tumors occur within the skull; however, a small number, three to six percent, appear in the spinal cord. Although the pathological difference between malignant and nonmalignant brain tumors (included in ICCC scheme) often does not correspond with clinical ramifications, CCR surveillance was legally restricted to malignant tumors up until cases diagnosed through December 31, 2000. Therefore, the description of all current California data includes only malignant CNS tumors.

For the 12-year period, 1988 through 1999, 2,478 cases of primary malignant tumors of the CNS were diagnosed in children under age 15. The most common glioma, astrocytomas, account for 46 percent of all CNS tumors, followed by primitive neuroectodermal tumors at 27 percent (PNET), other gliomas five percent, and ependymomas nine percent. Between 1994 and 1999, the overall average annual age-adjusted incidence was 2.61 cases per 100,000 children under age 15, with rates generally higher among males and in younger children (Figure 16). Age-related declines were greatest for PNET and ependymomas, with age-specific rates for astrocytomas and other gliomas remaining more stable across age groups.

Figure 16

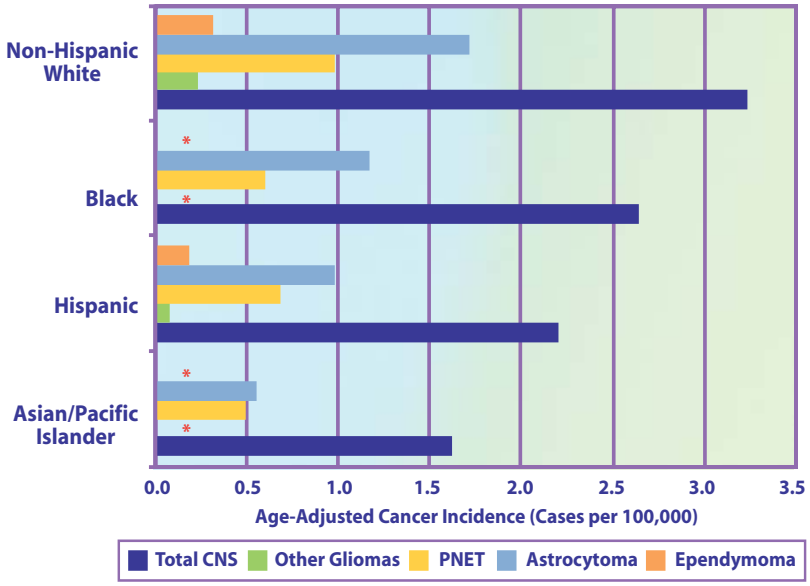
Average Annual Age-Specific Incidence of Malignant CNS Tumors in California Children by ICCC Category, Age and Sex, All Races Combined (1994-1999)



Prepared by the California Department of Health Services, Cancer Surveillance Section.

Figure 17

Average Annual Age-Adjusted Incidence of Malignant CNS Tumors by ICCC Category in California Children, Ages Birth to 14, by Race/Ethnicity, Both Sexes Combined (1994-1999)



* < 15 Cases in six-year period.
Prepared by the California Department of Health Services, Cancer Surveillance Section.

Table 4

Average Annual Age-Adjusted Incidence of Malignant CNS Tumors in California Children, Ages Birth to 14, by Sex and Race/Ethnicity (1994-1999)

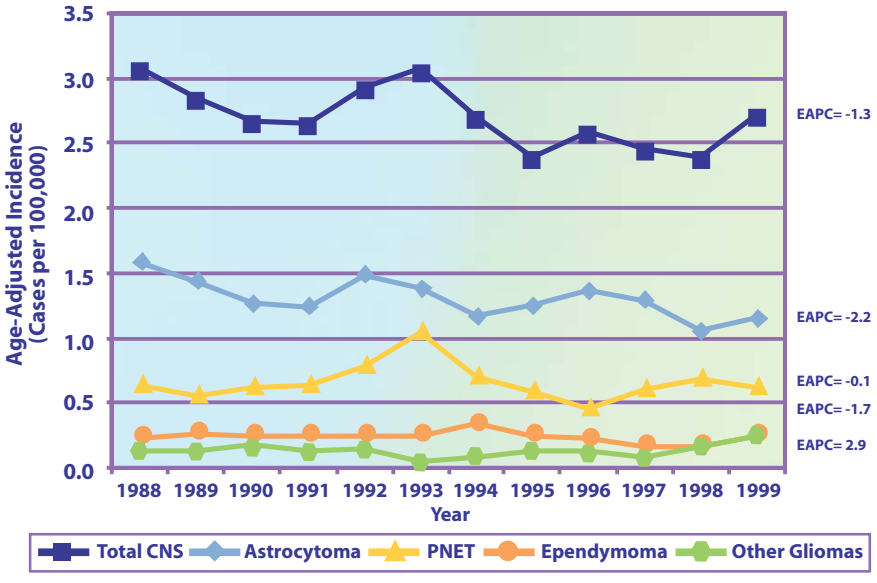
		Ependymoma 0-14 Years			Astrocytoma 0-14 Years			Primitive Neuroectodermal 0-14 Years			Other Gliomas 10-14 Years		
		Cases	AAIR	SE	Cases	AAIR	SE	Cases	AAIR	SE	Cases	AAIR	SE
All Races Combined	Male	58	0.23	0.03	307	1.27	0.07	189	0.77	0.06	36	0.15	0.02
	Female	52	0.22	0.03	267	1.16	0.07	135	0.58	0.05	29	0.13	0.02
	Total	110	0.23	0.02	574	1.21	0.05	324	0.67	0.04	65	0.14	0.02
Non-Hispanic White	Male	30	0.31	0.06	168	1.71	0.13	96	0.97	0.10	23	0.23	0.05
	Female	28	0.30	0.06	143	1.54	0.13	57	0.62	0.08	9	--	--
	Total	58	0.30	0.04	311	1.63	0.09	153	0.80	0.06	32	0.17	0.03
Black	Male	<5	--	--	21	1.16	0.25	11	--	--	<5	--	--
	Female	<5	--	--	15	0.86	0.22	10	--	--	<5	--	--
	Total	8	--	--	36	1.01	0.17	21	0.58	0.13	8	--	--
Hispanic	Male	18	0.18	0.04	95	0.97	0.10	68	0.68	0.08	7	--	--
	Female	10	--	--	91	0.96	0.10	60	0.60	0.08	14	--	--
	Total	28	0.14	0.03	186	0.96	0.07	128	0.64	0.06	21	0.11	0.02
Asian-Pacific Islander	Male	6	--	--	14	--	--	13	--	--	<5	--	--
	Female	7	--	--	15	0.61	0.16	7	--	--	<5	--	--
	Total	13	--	--	29	0.58	0.11	20	0.39	0.09	<5	--	--

Cases=Number of new primary malignant cases initially diagnosed between January 1, 1994 and December 31, 1999, reported to CCR as of August 2001.
Age-adjusted incidence rate (AAIR)=Average annual age-adjusted incidence for the six-year period, 1994-1999, reported as cases per 100,000, adjusted to the 2000 U.S. Standard.
SE=Standard error for the AAIR.
Prepared by the California Department of Health Services, Cancer Surveillance Section.

Age-adjusted incidence rates for all CNS tumors combined were higher among non-Hispanic whites and blacks (3.22 and 2.63 cases per 100,000, respectively); and lower among Hispanics (2.20 cases per 100,000) and Asian/Pacific Islanders (1.62 cases per 100,000) (Figure 17). Race-specific incidence varied by subtype with rates for gliomas, both astrocytomas and other gliomas, highest in non-Hispanic whites; for PNET in non-Hispanic whites and Hispanics; and for ependymoma in non-Hispanic whites and Asian/Pacific Islanders (Table 4).

In children under age 15, the AAIR for all CNS tumors decreased slightly since 1988 (EAPC -1.3 p=0.10). Similar declines were seen among both males (EAPC -1.1 p=0.33) and females (EAPC -1.6 p=0.01). This relative decline also occurred for the individual major ICCC categories, astrocytomas, medulloblastomas/primitive neuroectodermal tumors, and ependymomas, but not other gliomas, which increased since 1998; however, no trend in age-adjusted incidence was statistically significant (Figure 18).

Figure 18
Trends in the Incidence of Malignant CNS Tumors in California Children by ICCC Category, Ages Birth to 14, in California, Both Sexes and All Races Combined (1988-1999)



Prepared by the California Department of Health Services, Cancer Surveillance Section.

Sympathetic Nervous System (ICCC IV)

Neuroblastoma and other sympathetic nervous system tumors accounted for six percent of all childhood cancers diagnosed in California children. In the most recent six-year period, 1994 to 1999, 404 cases were diagnosed, or nearly 70 cases per year, with the vast majority over 90 percent being neuroblastoma. This malignancy is the major extracranial malignancy diagnosed in young children less than five years of age. Neuroblastoma most commonly occurs in the adrenal glands, followed by malignancies of connective or soft tissue, the retroperitonium, and the mediastinum.

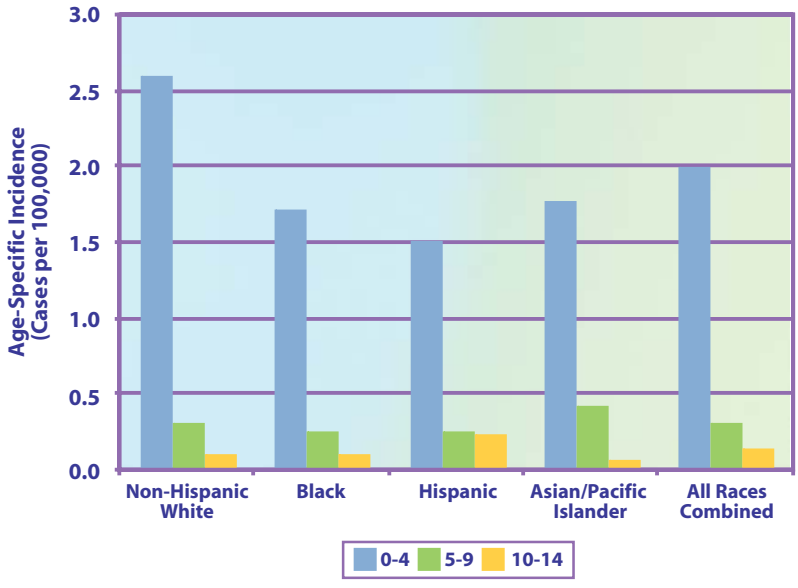
In the most recent six-year period, 1994 to 1999, the age-adjusted incidence for sympathetic nervous system tumors was 0.79 cases per 100,000, with age-adjusted incidence higher among males (0.87 per 100,000) than females (0.70 per 100,000).

Figure 19 illustrates the age-specific incidence of sympathetic nervous system tumors by race/ethnicity. The highest age-specific rates were among children under five, reflecting the young median age at diagnosis (one year), 1.98 cases per 100,000, with rates in males higher than females (2.24 and 1.72 cases per 100,000). Age-specific rates were highest among non-Hispanic whites (2.59 per 100,000 children under five) and Asian/Pacific Islanders (1.77 per 100,000 children under five).

Over the 12-year period, 1988 to 1999, there has been a substantial decline in the age-adjusted incidence of sympathetic nervous system tumors in California children (EAPC -2.0 p=0.04).

Figure 19

Average Age-Specific Incidence of Sympathetic Nervous System Tumors in California Children, Ages Birth to 9, by Age and Race/Ethnicity, Both Sexes Combined (1994-1999)



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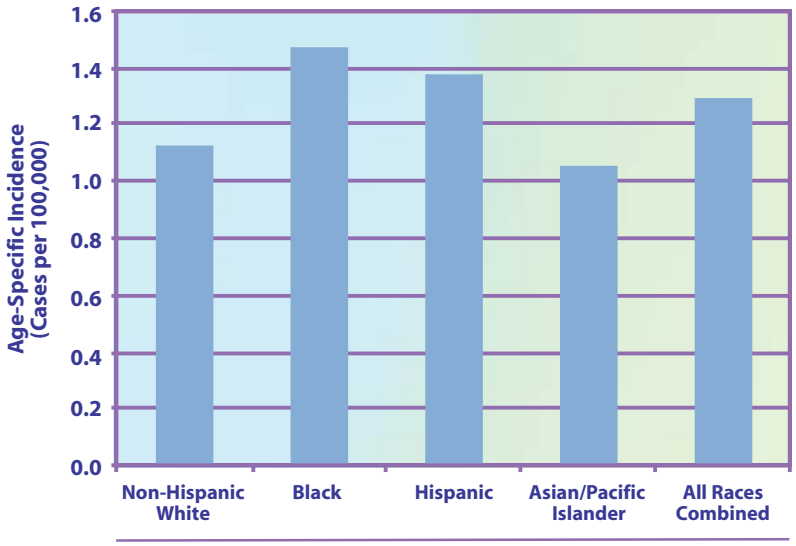
Retinoblastoma (ICCC V)

Retinoblastoma is a malignancy of the eye retina, but occasionally occurs in the pineal gland, with cases arising from embryonic neural tissue. Alteration of both copies of a specific retinoblastoma gene (Rb) induces this malignancy, mutant Rb genes may be inherited or arise sporadically from a non-inheritable cell. Cases may be unilateral (affect one eye) or bilateral (affect both eyes), with bilateral cases more often diagnosed at a younger age.

Retinoblastoma accounts for less than four percent of all childhood malignancies in California children (age-adjusted incidence 0.44 cases per 100,000), but nearly seven percent of malignancies in children under age five. On average, 40 cases of retinoblastoma are reported annually, with over 80 percent diagnosed prior to age three (mean age 1.2 years).

Figure 20 illustrates age-specific incidence by sex and race/ethnicity for children under age five. Overall, males had a higher incidence relative to females (1.41 and 1.17 cases per 100,000, respectively). The highest age-specific rates occurred in Hispanics and blacks (1.37 and 1.47 cases per 100,000), with fewer than five cases reported annually among Asian/Pacific Islanders.

Figure 20
Average Annual Age-Specific Incidence of Retinoblastoma in California Children, Ages Birth to 4, by Race/Ethnicity, Both Sexes Combined (1994-1999)



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Renal Tumors (ICCC VI)

Malignancies of the kidney, or renal tumors, account for five percent of all malignant cancers diagnosed in children under age 15, with Wilms' tumor (or nephroblastoma) representing the most common type, (99 percent of all cases). California averages over 55 new cases of renal tumors each year, representing an age-adjusted incidence of 0.66 cases per 100,000 children under age 15.

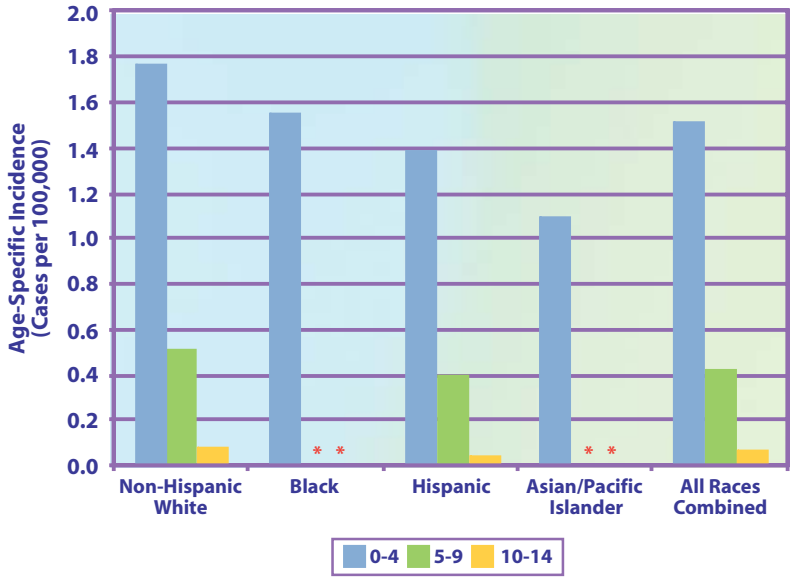
The incidence of renal tumors varies by sex, with rates higher in females than males, 0.81 versus 0.52 cases per 100,000. However, males often present at an earlier in age. Additionally, renal cancer incidence also varies substantially by age, with the majority of cases, 76 percent, diagnosed prior to age five, representing an age-specific incidence of 1.51 cases per 100,000.

In California, non-Hispanic whites and blacks, at 0.77 cases per 100,000, have the highest incidence rates, followed by rates in Hispanics (0.60 cases per 100,000) and Asian/Pacific Islanders (0.40 cases per 100,000) (Figure 21).

Since 1988, the age-adjusted childhood incidence rates for renal tumors have declined substantially in California children under age 15 (EAPC -2.5 p=0.003).

Figure 21

Average Annual Age-Specific Incidence of Wilms' Tumor, Rhaboid, and Clear Cell Carcinoma in California Children, Ages Birth to 14, by Age and Race/Ethnicity, Both Sexes Combined (1994-1999)



* <15 cases in six-year period.
Prepared by the California Department of Health Services, Cancer Surveillance Section.

Hepatic Tumors (ICCC VII)

Primary malignancies of the liver are extremely rare in children, with fewer than 15 cases diagnosed annually in California (age-adjusted incidence 0.16 per 100,000 children under age 15). The majority of cases, 80 percent, occur in children under age five, usually as hepatoblastoma, with both the overall rate and proportion of hepatoblastoma declining with increasing age. In these youngest children, the age-specific incidence was 0.38 cases per 100,000 with no difference by sex. Hispanics and non-Hispanic whites have the highest overall incidence (0.19 and 0.13 cases per 100,000). Since 1988, the incidence in hepatic tumors has declined substantially in California (EAPC -5.0 percent p=0.01).

Malignant Bone Tumors (ICCC VIII)

Malignant bone tumors rarely occur in children under age 15, accounting for only four percent of all reported malignancies. Osteosarcoma and Ewing's sarcoma are the most common childhood bone malignancies, (66 percent and 28 percent of all cases). Although any bone may be affected, the majority of Ewing's and osteosarcoma cases involve bones of the lower extremities or pelvic girdle. In California, an average of 40 children were diagnosed annually with bone tumors, representing an age-adjusted incidence of 0.57 cases per 100,000.

Age-specific rates for bone tumors vary substantially, with 10 to 14 year olds having the highest incidence among children under 15 at 1.21 cases per 100,000 (Figure 22). In California, the overall incidence was similar between males and females in children under 15 (0.55 and 0.59 cases per 100,000).

AAIR were highest among non-Hispanic whites and Hispanics (0.65 and 0.54 cases per 100,000), with fewer than four cases reported annually in blacks or Asian/Pacific Islanders. For osteosarcoma, age-adjusted incidence was higher among Hispanics relative to non-Hispanics, with the opposite true for Ewing's sarcoma.

In the 12-year period 1988 to 1999, the AAIR for malignant bone tumors decreased, but was not statistically significant, in California children under age 15 (EAPC -2.1 p=0.09).

Figure 22

Average Annual Age-Specific Incidence of Malignant Bone Tumors in California Children, Ages Birth to 14, by ICCC Category and Age, Both Sexes and All Races Combined (1994-1999)

Prepared by the California Department of Health Services, Cancer Surveillance Section

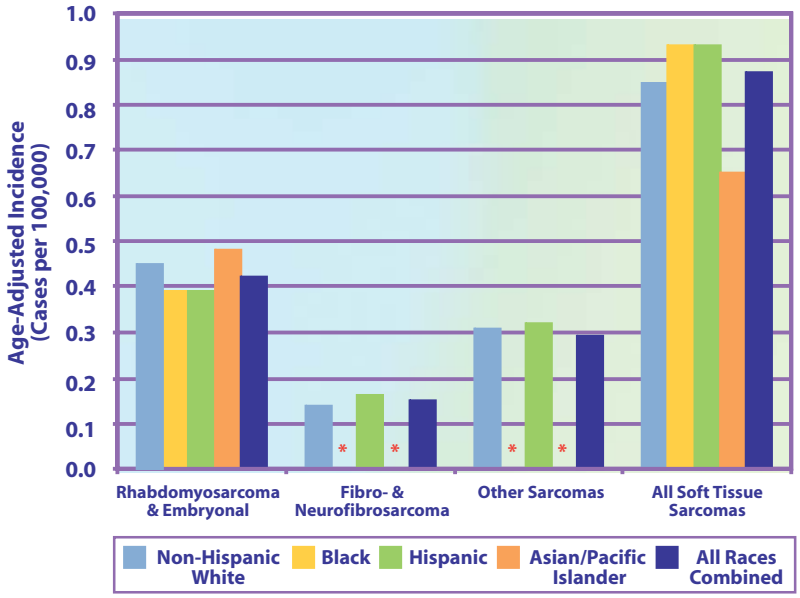
Soft Tissue Sarcomas (ICCC IX)

Childhood soft tissue sarcomas tend to initiate in connective tissue, such as that found in muscle, tendon, or fibrous tissues. In California, these soft tissue tumors accounted for six percent of all childhood cancers (under age 15). Rhabdomyosarcoma is the most common soft tissue sarcoma (Figure 23), with embryonal rhabdomyosarcoma incidence higher in the youngest children, under age five, and alveolar rhabdomyosarcoma more predominant through adolescence.

In California, the overall age-adjusted incidence for all soft tissue sarcomas was 0.87 cases per 100,000, higher in males than females (0.91 and 0.83 cases per 100,000). However, this gender difference migrates with increasing age, peaking in the youngest age group, under age five (1.05 and 0.89 cases per 100,000, males and females, respectively), declining in 5 to 9 year-olds (0.82 and 0.61 cases per 100,000, males and females), and reversing in 10 to 14 year-olds (0.88 and 0.98 cases per 100,000, males and females).

Figure 23

Histological Distribution of Soft Tissue Sarcoma by Incidence in California Children, Ages Birth to 14, by ICCC Category and Race/Ethnicity, Both Sexes Combined (1994-1999)



* <15 cases in six-year period.
Prepared by the California Department of Health Services, Cancer Surveillance Section.

The age-adjusted incidence of soft tissue sarcomas was slightly higher in Hispanics and blacks (0.93 cases per 100,000), followed by rates in non-Hispanic whites (0.85 cases per 100,000) and Asian/Pacific Islanders (0.65 cases per 100,000).

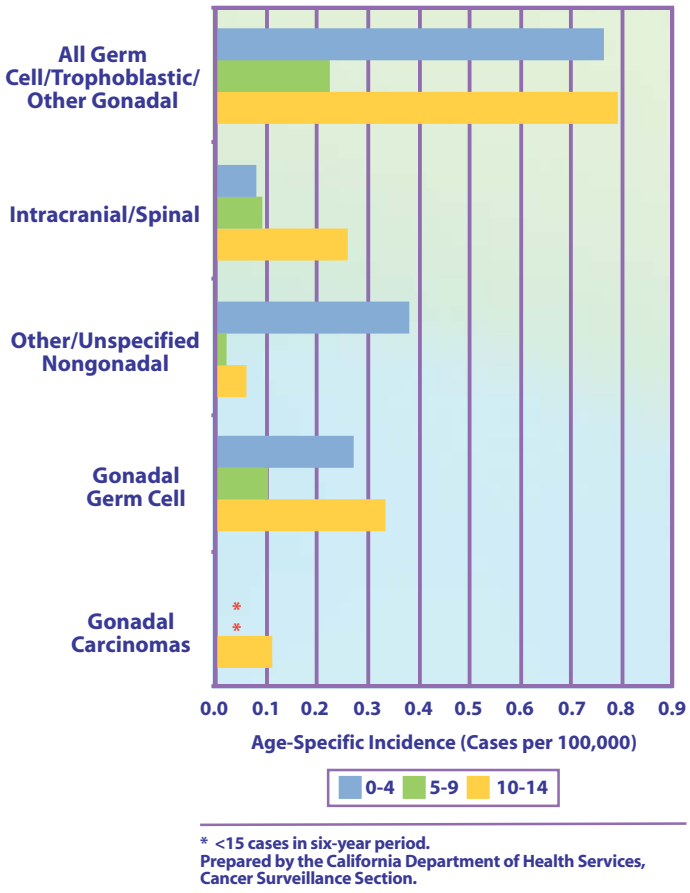
The incidence of soft tissue sarcomas in California has remained relatively stable in children under 15, with only a slight, not statistically significant, decline since 1988 (EAPC -0.9 p=0.37).

Germ Cell, Trophoblastic, and Other Gonadal Neoplasms (ICCC X)

Germ cell, trophoblastic, and other gonadal neoplasms (GCTOG) consist of a heterogeneous group of tumors accounting for four percent of all cancers diagnosed in children under age 15. In this age group, under one-half of these tumors arise in the gonads (testicles or ovaries), with the remainder, or non-gonadal tumors, initiating in embryonic-related cells of the central nervous system, retroperitoneum, or other soft tissues.

Figure 24

Average Annual Age-Specific Incidence of Germ Cell, Trophoblastic, and Other Gonadal Neoplasma in California Children, Ages Birth to 14, by ICCC Category and Age, Both Sexes and All Races Combined (1994-1999)



* <15 cases in six-year period.
Prepared by the California Department of Health Services, Cancer Surveillance Section.

In California, the average annual age-adjusted incidence for all GCTOG malignancies was 0.58 cases per 100,000 children under age 15. Overall age-adjusted incidence was higher in females (0.66 cases per 100,000) than males (0.51 cases per 100,000). However, rates varied substantially by diagnostic subgroup. Asian/ Pacific Islander and Hispanic children had the highest overall age-adjusted incidence of germ cell and related malignancies, 1.09 and 0.69 cases per 100,0000, respectively.

Age-specific incidence of gonadal germ cell malignancies was highest in males under age five (0.48 cases per 100,000) and females ages 10 to 14 (0.56 cases per 100,000). GCTOG tumors of CNS occurred most frequently in males ages 10 to 14 (0.38 cases per 100,000), while other non-gonadal GCTOG tumors were primarily diagnosed in females under age five (0.51 cases per 100,000).

Since 1988, the age-adjusted incidence of all germ cell, trophoblastic, and other gonadal malignancies combined has declined significantly in California, estimated annual percent change -2.5 percent (p=0.004).

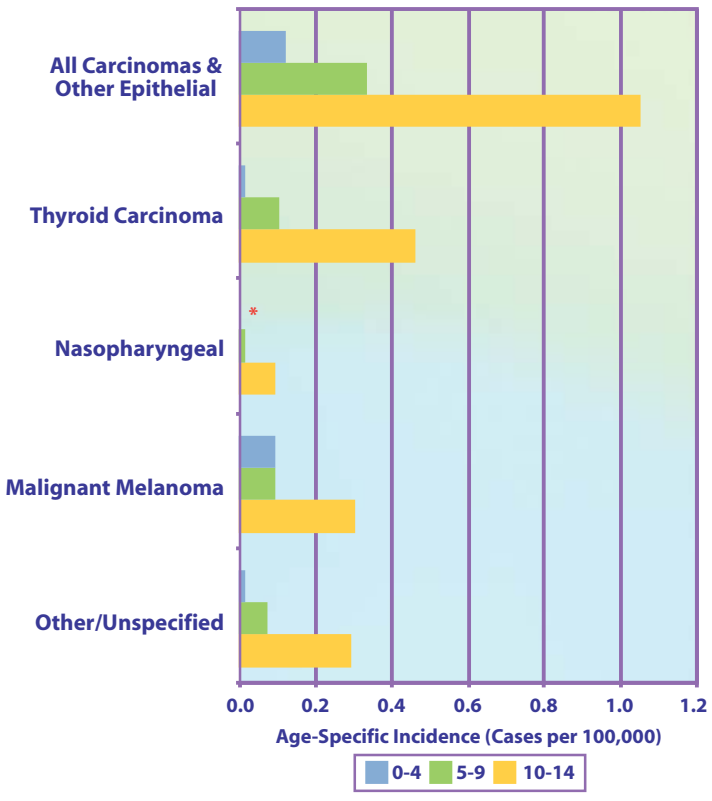
Carcinomas and Other Epithelial Cancers (ICCC XI)

Carcinomas, or malignancies that initiate in epithelial tissues, although the most common type of adult tumors (such as malignancies of the breast, prostate, lung and colon), account for significantly fewer childhood tumors, (less than four percent of all malignancies in children).

Melanomas (33 percent) and carcinomas of the thyroid (32 percent) accounted for the majority of childhood malignancies in this ICCC category, with fewer than five cases reported annually for adrenocortical, nasopharyngeal, or other skin carcinomas. However, other and unspecified carcinomas comprised a substantial proportion, 24 percent, of the cases in this diagnostic category.

Figure 25

Average Annual Age-Specific Incidence of Carcinomas and Other Epithelial Cancers in California Children, Ages Birth to 14, by ICCC Category and Age, Both Sexes and All Races Combined (1994-1999)



* <15 cases in six-year period.
Prepared by the California Department of Health Services, Cancer Surveillance Section.

In California, approximately 40 children were diagnosed annually with carcinomas, representing an AAIR of 0.51 cases per 100,000, with incidence higher in females (0.62 per 100,000) versus males (0.40 cases per 100,000). Non-Hispanic white and Hispanic children had the highest AAIR (0.61 and 0.41 cases per 100,000, respectively), with few cases diagnosed in black or Asian/Pacific Islanders under age 15.

Age-specific rates increase with age, with children ages 10 to 14 having the highest incidence, 1.05 cases per 100,000, particularly among females (1.26 cases per 100,000) (Figure 25). In this age group, malignant melanoma incidence was similar in males and females (0.31 and 0.29 cases per 100,000), compared to higher age-specific incidence in females for thyroid carcinoma (0.53 cases per 100,000) and other or unspecified carcinomas (0.31 cases per 100,000).

In the 12-year period, 1988 to 1999, no statistically significant change in the overall age-adjusted incidence of carcinomas and other epithelial cancers has occurred in California children (EAPC -0.9 p=0.46).

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Internet Resources

American Cancer Society
http://www.cancer.org
California Cancer Registry
http://www.ccrcal.org
Cancer Information Service - 1-800-4-CANCER
http://cis.nci.nih.gov/contact/faqform.html
Childhood Brain Tumor Foundation
http://www.childhoodbraintumor.org/
Leukemia Research Foundation
http://www.leukemia-research.org
National Brain Tumor Foundation
http://www.braintumor.org
National Cancer Institute Information
http://cis.nci.nih.gov/resources/resources.html
National Cancer Institute - PDQ(r)
http://www.cancer.gov/cancer_information/pdq/
National Cancer Institute - Cancer information
http://cancer.gov/cancerinformation
National Cancer Institute - Surveillance, Epidemiology, and End Results (SEER)
http://seer.cancer.gov
National Children's Leukemia Foundation
http://www.leukemiafoundation.org
National Childhood Cancer Foundation
http://www.nccf.org
Children's Oncology Group
http://www.pog.ufl.edu

Appendix A

International Classification of Childhood Cancer (ICCC)[1]

I. Leukemia
- a. Lymphoid leukemia
- b. Acute non-lymphocytic leukemia
- c. Chronic myeloid leukemia
- d. Other specified leukemia
- e. Unspecified leukemia

II. Lymphomas and Other Reticuloendothelial Neoplasms
- a. Hodgkin's disease
- b. Non-Hodgkin's disease
- c. Burkitt's lymphoma
- d. Other reticuloendothelial neoplasms
- e. Unspecified lymphomas

III. Central Nervous System and Miscellaneous Intracranial and Intraspinal Neoplasms
- a. Ependymoma
- b. Astrocytoma
- c. Primitive neuroectodermal tumors
- d. Other gliomas
- e. Miscellaneous intracranial and intraspinal neoplasms
- f. Unspecified intracranial and intraspinal neoplasms

IV. Sympathetic Nervous System Tumors
- a. Neuroblastoma and ganglioneuroblastoma
- b. Other sympathetic nervous system tumors

V. Retinoblastoma

VI. Renal Tumors
- a. Wilms' tumor, rhabdoid, and clear cell sarcoma
- b. Renal carcinoma
- c. Unspecified malignant renal tumors

VII. Hepatic Tumors
- a. Hepatoblastoma
- b. Hepatic carcinoma
- c. Unspecified malignant hepatic tumors

VIII. Malignant Bone Tumors
- a. Osteosarcoma
- b. Chondrosarcoma
- c. Ewing's sarcoma
- d. Other specified malignant bone tumors
- e. Unspecified malignant bone tumors

IX. Soft-Tissue Sarcomas
- a. Rhabdomyosarcoma and embryonal sarcoma
- b. Fibrosarcoma, neurofibrosarcoma, and other neurofibromatous neoplasms
- c. Kaposi's sarcoma
- d. Other specified soft-tissue sarcomas
- e. Unspecified soft-tissue sarcomas

X. Germ Cell, Trophoblastic, and Other Gonadal Neoplasms
- a. Intracranial and intraspinal germ cell tumors
- b. Other and unspecified non-gonadal germ cell tumors
- c. Gonadal germ cell tumors
- d. Gonadal carcinomas
- e. Other and unspecified malignant gonadal tumors

XI. Carcinomas and Other Malignant Epithelial Neoplasms
- a. Adrenocortical carcinoma
- b. Thyroid carcinoma
- c. Nasopharyngeal carcinoma
- d. Malignant melanoma
- e. Skin carcinoma
- f. Other and unspecified carcinomas

XII. Other and Unspecified Malignant Neoplasms
- a. Other specified malignant tumors
- b. Other unspecified malignant tumors

1. Kramarova E and Stiller CA. The International Classification of Childhood Cancer. *Int J Cancer* 1996;68:759-765.

Appendix B

Childhood Cancer Six-Year Case Counts and Average Annual Age-Specific Incidence Rates by Selected ICCC Category/Subcategory, Sex and Age Group (0-4, 5-9, 10-14), All Races Combined, in California, 1994-1999

ICCC Category / Cancer Type	Sex	1994-1999 0-4 Years Cases	ASIR	SE	1994-1999 5-9 Years Cases	ASIR	SE	1994-1999 10-14 Years Cases	ASIR	SE
All Cancers Combined	Male	1,748	20.17	0.48	959	11.57	0.37	840	11.73	0.40
	Female	1,416	17.11	0.45	762	9.64	0.35	800	11.71	0.41
	Total	3,164	18.68	0.33	1,721	10.63	0.26	1,640	11.72	0.29
I. Leukemia	Male	713	8.23	0.31	360	4.34	0.23	231	3.23	0.21
	Female	563	6.80	0.29	268	3.39	0.21	198	2.90	0.21
	Total	1,276	7.53	0.21	628	3.88	0.15	429	3.07	0.15
I.a. Acute Lymphocytic	Male	586	6.76	0.28	294	3.55	0.21	159	2.22	0.18
	Female	455	5.50	0.26	220	2.78	0.19	128	1.87	0.17
	Total	1,041	6.14	0.19	514	3.17	0.14	287	2.05	0.12
I.b. Acute Non-Lymphocytic	Male	94	1.08	0.11	46	0.56	0.08	50	0.70	0.10
	Female	80	0.97	0.11	33	0.42	0.07	55	0.81	0.11
	Total	174	1.03	0.08	79	0.49	0.05	105	0.75	0.07
I.c. Chronic Myeloid	Male	29	0.33	0.06	14	--	--	25	0.35	0.07
	Female	29	0.35	0.07	11	--	--	24	0.35	0.07
	Total	58	0.34	0.04	25	0.15	0.03	49	0.35	0.05
I.d. Other Specified	Male	8	--	--	9	--	--	10	--	--
	Female	10	--	--	8	--	--	5	--	--
	Total	18	0.11	0.03	17	0.11	0.03	15	0.11	0.03
I.e. Unspecified	Male	7	--	--	6	--	--	<5	--	--
	Female	11	--	--	<5	--	--	<5	--	--
	Total	18	0.11	0.03	7	--	--	<5	--	--
II. Lymphoma and Other Reticuloendothelial	Male	79	0.91	0.10	152	1.83	0.15	176	2.46	0.19
	Female	35	0.42	0.07	59	0.75	0.10	111	1.63	0.15
	Total	114	0.67	0.06	211	1.30	0.09	287	2.05	0.12
II.a. Hodgkin's Disease	Male	11	--	--	51	0.62	0.09	77	1.08	0.12
	Female	5	--	--	17	0.22	0.05	65	0.95	0.12
	Total	16	0.09	0.02	68	0.42	0.05	142	1.02	0.09
II.b. Non-Hogkin's Disease	Male	44	0.55	0.08	63	0.91	0.11	57	0.92	0.12
	Female	17	0.21	0.05	27	0.34	0.07	36	0.53	0.09
	Total	54	0.32	0.04	93	0.57	0.06	110	0.79	0.07
II.c. Burkitt's Lymphoma	Male	26	0.30	0.06	31	0.37	0.07	16	0.22	0.06
	Female	6	--	--	12	--	--	6	--	--
	Total	32	0.19	0.03	43	0.27	0.04	22	0.16	0.03
II.d. Miscellaneous Lymphoreticular	Male	<5	--	--	<5	--	--	<5	--	--
	Female	<5	--	--	<5	--	--	<5	--	--
	Total	7	--	--	<5	--	--	<5	--	--
II.e. Unspecified	Male	<5	--	--	<5	--	--	8	--	--
	Female	<5	--	--	<5	--	--	<5	--	--
	Total	5	--	--	6	--	--	12	--	--

Data presented for major ICCC categories and selected subcategories.
Rates based on fewer than 15 cases over this six-year period are not shown.
ASIR=average annual age-specific incidence rates per 100,000 for the six-year period, 1994-1999. SE=Standard error.
Prepared by the California Department of Health Services, Cancer Surveillance Section.

Appendix B

Childhood Cancer Six-Year Case Counts and Average Annual Age-Specific Incidence Rates by Selected ICCC Category/Subcategory, Sex and Age Group (0-4, 5-9, 10-14), All Races Combined, in California, 1994-1999

ICCC Category / Cancer Type	Sex	1994-1999 0-4 Years Cases	ASIR	SE	1994-1999 5-9 Years Cases	ASIR	SE	1994-1999 10-14 Years Cases	ASIR	SE
III. Central Nervous System	Male	280	3.23	0.19	234	2.82	0.18	164	2.29	0.18
	Female	224	2.71	0.18	204	2.58	0.18	139	2.04	0.17
	Total	504	2.97	0.13	438	2.71	0.13	303	2.17	0.12
III.a. Ependymoma	Male	36	0.42	0.07	12	--	--	10	--	--
	Female	24	0.29	0.06	14	--	--	14	--	--
	Total	60	0.35	0.05	26	0.16	0.03	24	0.17	0.04
III.b. Astrocytoma	Male	120	1.38	0.13	100	1.21	0.12	87	1.22	0.13
	Female	93	1.12	0.12	100	1.27	0.13	74	1.08	0.13
	Total	213	1.26	0.09	200	1.24	0.09	161	1.15	0.09
III.c. Primitive Neuroectodermal	Male	80	0.92	0.10	72	0.87	0.10	37	0.52	0.08
	Female	64	0.77	0.10	39	0.49	0.08	32	0.47	0.08
	Total	144	0.85	0.07	111	0.69	0.07	69	0.49	0.06
III.d. Other Gliomas	Male	12	--	--	15	0.18	0.05	9	--	--
	Female	7	--	--	16	0.20	0.05	6	--	--
	Total	19	0.11	0.03	31	0.19	0.03	15	0.11	0.03
III.e. Miscellaneous Specified	Male	7	--	--	<5	--	--	<5	--	--
	Female	6	--	--	<5	--	--	<5	--	--
	Total	13	--	--	7	--	--	5	--	--
III.f. Unspecified	Male	12	--	--	<5	--	--	<5	--	--
	Female	8	--	--	<5	--	--	<5	--	--
	Total	20	0.12	0.03	<5	--	--	<5	--	--
IV. Sympathetic Nervous System	Male	194	2.24	0.16	27	0.33	0.06	9	--	--
	Female	142	1.72	0.14	22	0.28	0.06	10	--	--
	Total	336	1.98	0.11	49	0.30	0.04	19	0.14	0.03
IV.a. Neuroblastoma and Ganglioneuroblastoma	Male	191	2.20	0.16	26	0.31	0.06	<5	--	--
	Female	140	1.69	0.14	21	0.27	0.06	7	--	--
	Total	331	1.95	0.11	47	0.29	0.04	10	--	--
V. Retinoblastoma	Male	122	1.41	0.13	<5	--	--	<5	--	--
	Female	97	1.17	0.12	7	--	--	<5	--	--
	Total	219	1.29	0.09	12	--	--	<5	--	--
VI. Renal	Male	106	1.22	0.12	28	0.34	0.06	<5	--	--
	Female	150	1.81	0.15	43	0.54	0.08	8	--	--
	Total	256	1.51	0.09	71	0.44	0.05	11	--	--
VI.a. Wilm's Tumor, Rhabdoid and Clear Cell	Male	106	1.22	0.12	28	0.34	0.06	<5	--	--
	Female	150	1.81	0.15	40	0.51	0.08	7	--	--
	Total	256	1.51	0.09	68	0.42	0.05	9	--	--
VI.b. Renal Carcinoma	Male	<5	--	--	<5	--	--	<5	--	--
	Female	<5	--	--	<5	--	--	<5	--	--
	Total	<5	--	--	<5	--	--	<5	--	--
VI.c. Unspecified	Male	<5	--	--	<5	--	--	<5	--	--
	Female	<5	--	--	<5	--	--	<5	--	--
	Total	<5	--	--	<5	--	--	<5	--	--

Data presented for major ICCC categories and selected subcategories.
Rates based on fewer than 15 cases over this six-year period are not shown.
ASIR=average annual age-specific incidence rates per 100,000 for the six-year period, 1994-1999. SE=Standard error.
Prepared by the California Department of Health Services, Cancer Surveillance Section

Appendix B

Childhood Cancer Six-Year Case Counts and Average Annual Age-Specific Incidence Rates by Selected ICCC Category/Subcategory, Sex and Age Group (0-4, 5-9, 10-14), All Races Combined, in California, 1994-1999

ICCC Category	Cancer Type	Sex	1994-1999 0-4 Years Cases	ASIR	SE	1994-1999 5-9 Years Cases	ASIR	SE	1994-1999 10-14 Years Cases	ASIR	SE
VII.	Hepatic Tumors	Male	32	0.37	0.07	<5	--	--	6	--	--
		Female	32	0.39	0.07	<5	--	--	7	--	--
		Total	64	0.38	0.05	<5	--	--	13	--	--
VII.a.	Hepatoblastoma	Male	32	0.37	0.07	<5	--	--	<5	--	--
		Female	31	0.37	0.07	<5	--	--	<5	--	--
		Total	63	0.37	0.05	<5	--	--	<5	--	--
VIII.	Malignant Bone	Male	14	--	--	30	0.36	0.07	79	1.10	0.12
		Female	<5	--	--	30	0.38	0.07	90	1.32	0.14
		Total	18	0.11	0.03	60	0.37	0.05	169	1.21	0.09
VIII.a.	Osteosarcoma	Male	<5	--	--	19	0.23	0.05	54	0.75	0.10
		Female	<5	--	--	22	0.28	0.06	63	0.92	0.12
		Total	<5	--	--	41	0.25	0.04	117	0.84	0.08
VIII.b.	Chondrosarcoma	Male	<5	--	--	<5	--	--	<5	--	--
		Female	<5	--	--	<5	--	--	<5	--	--
		Total	<5	--	--	<5	--	--	6	--	--
VIII.c.	Ewing's Sarcoma	Male	9	--	--	9	--	--	20	0.28	0.06
		Female	<5	--	--	6	--	--	22	0.32	0.07
		Total	11	--	--	15	0.09	0.02	42	0.30	0.05
VIII.d.	Other specified	Male	<5	--	--	<5	--	--	<5	--	--
		Female	<5	--	--	<5	--	--	<5	--	--
		Total	5	--	--	<5	--	--	<5	--	--
VIII.e.	Unspecified	Male	<5	--	--	<5	--	--	<5	--	--
		Female	<5	--	--	<5	--	--	<5	--	--
		Total	<5	--	--	<5	--	--	<5	--	--
IX.	Soft Tissue Sarcoma	Male	91	1.05	0.11	68	0.82	0.10	63	0.88	0.11
		Female	74	0.89	0.10	48	0.61	0.09	67	0.98	0.12
		Total	165	0.97	0.08	116	0.72	0.07	130	0.93	0.08
IX.a.	Rhabdomyosarcoma and Embryonal	Male	64	0.74	0.09	41	0.49	0.08	19	0.27	0.06
		Female	41	0.50	0.08	25	0.32	0.06	17	0.25	0.06
		Total	105	0.62	0.06	66	0.41	0.05	36	0.26	0.04
IX.b.	Fibrosarcoma and Neurofibrosarcoma	Male	9	--	--	7	--	--	12	0.17	0.05
		Female	9	--	--	11	--	--	20	0.29	0.07
		Total	18	0.11	0.03	18	0.11	0.03	32	0.23	0.04
IX.c.	Kaposi's Sarcoma	Male	<5	--	--	<5	--	--	<5	--	--
		Female	<5	--	--	<5	--	--	<5	--	--
		Total	<5	--	--	<5	--	--	<5	--	--
IX.d.	Other Specified	Male	15	0.17	0.04	15	0.18	0.05	20	0.28	0.06
		Female	20	0.24	0.05	9	--	--	23	0.34	0.07
		Total	35	0.21	0.03	24	0.15	0.03	43	0.31	0.05
IX.e.	Unspecified	Male	<5	--	--	5	--	--	12	--	--
		Female	<5	--	--	<5	--	--	7	--	--
		Total	6	--	--	8	--	--	19	0.14	0.03

Data presented for major ICCC categories and selected subcategories.
Rates based on fewer than 15 cases over this six-year period are not shown.
ASIR=average annual age-specific incidence rates per 100,000 for the six-year period, 1994-1999. SE=Standard error.
Prepared by the California Department of Health Services, Cancer Surveillance Section

Appendix B

Childhood Cancer Six-Year Case Counts and Average Annual Age-Specific Incidence Rates by Selected ICCC Category/Subcategory, Sex and Age Group (0-4, 5-9, 10-14), All Races Combined, in California, 1994-1999

ICCC Category	Cancer Type	Sex	1994-1999 0-4 Years Cases	ASIR	SE	1994-1999 5-9 Years Cases	ASIR	SE	1994-1999 10-14 Years Cases	ASIR	SE
X.	Germ Cell, Trophoblastic, and Other Gonadal	Male	72	0.83	0.10	11	--	--	41	0.57	0.09
		Female	56	0.68	0.09	24	0.30	0.06	69	1.01	0.12
		Total	128	0.76	0.07	35	0.22	0.04	110	0.79	0.07
X.a.	Intracranial and Intraspinal Germ Cell	Male	6	--	--	7	--	--	27	0.38	0.07
		Female	8	--	--	7	--	--	9	--	--
		Total	14	--	--	14	--	--	36	0.26	0.04
X.b.	Other/Unspecified Non-Gonadal	Male	23	0.27	0.06	<5	--	--	6	--	--
		Female	42	0.51	0.08	<5	--	--	<5	--	--
		Total	65	0.38	0.05	<5	--	--	8	--	--
X.c.	Gonadal Germ Cell Tumors	Male	42	0.48	0.07	<5	--	--	8	--	--
		Female	<5	--	--	14	--	--	38	0.56	0.09
		Total	46	0.27	0.04	16	0.10	0.02	46	0.33	0.05
X.d.	Gonadal Carcinomas	Male	<5	--	--	<5	--	--	<5	--	--
		Female	<5	--	--	<5	--	--	15	0.22	0.06
		Total	<5	--	--	<5	--	--	15	0.11	0.03
X.e.	Other and Unspecified Gonadal Neoplasms	Male	<5	--	--	<5	--	--	<5	--	--
		Female	<5	--	--	<5	--	--	<5	--	--
		Total	<5	--	--	<5	--	--	5	--	--
XI.	Epithelial and Other Carcinomas	Male	10	--	--	19	0.23	0.05	61	0.85	0.11
		Female	10	--	--	35	0.44	0.07	86	1.26	0.14
		Total	20	0.12	0.03	54	0.33	0.05	147	1.05	0.09
XI.b.	Thyroid Carcinoma	Male	<5	--	--	6	--	--	11	--	--
		Female	<5	--	--	17	0.22	0.05	36	0.53	0.09
		Total	<5	--	--	23	0.14	0.03	47	0.34	0.05
XI.c.	Nasopharyngeal Carcinoma	Male	<5	--	--	<5	--	--	5	--	--
		Female	<5	--	--	<5	--	--	7	--	--
		Total	<5	--	--	<5	--	--	12	--	--
XI.d.	Malignant Melanoma	Male	8	--	--	6	--	--	22	0.31	0.07
		Female	8	--	--	9	--	--	20	0.29	0.07
		Total	16	0.09	0.02	15	0.09	0.02	42	0.30	0.05
XI.f.	Other/Unspecified Carcinoma	Male	<5	--	--	5	--	--	19	0.27	0.06
		Female	<5	--	--	7	--	--	21	0.31	0.07
		Total	<5	--	--	12	--	--	40	0.29	0.05
XII.	Other and Unspecified Malignancies	Male	<5	--	--	<5	--	--	<5	--	--
		Female	<5	--	--	<5	--	--	<5	--	--
		Total	5	--	--	5	--	--	5	--	--

Data presented for major ICCC categories and selected subcategories.
Rates based on fewer than 15 cases over this six-year period are not shown.
ASIR=average annual age-specific incidence rates per 100,000 for the six-year period, 1994-1999. SE=Standard error.
Prepared by the California Department of Health Services, Cancer Surveillance Section.

Appendix C

Childhood Cancer Six-Year Case Counts and Average Annual Age-Adjusted Incidence Rates (Ages 0-14), 1994-1999, with Twelve-Year Trends, by Major ICCC Category, Sex and Race/Ethnicity in California, 1988-1999

ICCC Category / Cancer Type	Sex	Non-Hispanic White 1994-1999 0-14 Years Cases	AAIR	SE	Black 1994-1999 0-14 Years Cases	AAIR	SE	Hispanic 1994-1999 0-14 Years Cases	AAIR	SE
All Cancers Combined	Male	1,459	14.87	0.39	212	11.64	0.80	1,512	14.92	0.39
	Female	1,210	13.06	0.38	187	10.55	0.77	1,256	13.12	0.38
	Total	2,669	13.99	0.27	399	11.10	0.56	2,768	14.04	0.27
I. Leukemia	Male	471	4.79	0.22	58	3.16	0.42	640	6.18	0.25
	Female	382	4.11	0.21	47	2.66	0.39	496	5.05	0.23
	Total	853	4.46	0.15	105	2.91	0.29	1,136	5.62	0.17
I.a. Acute Lymphocytic	Male	368	3.74	0.19	36	1.94	0.32	530	5.08	0.22
	Female	294	3.16	0.18	27	1.52	0.29	406	4.08	0.21
	Total	662	3.45	0.13	63	1.74	0.22	936	4.59	0.15
II. Lymphoma and Other Reticuloendothelial	Male	161	1.65	0.13	29	1.63	0.30	169	1.86	0.15
	Female	89	0.97	0.10	20	1.21	0.27	75	0.88	0.10
	Total	250	1.32	0.08	49	1.43	0.20	244	1.38	0.09
III. Central Nervous System	Male	344	3.49	0.19	50	2.74	0.39	229	2.31	0.16
	Female	272	2.93	0.18	45	2.51	0.38	204	2.09	0.15
	Total	616	3.22	0.13	95	2.63	0.27	433	2.20	0.11
IV. Sympathetic Nervous System	Male	102	1.04	0.10	12	--	--	85	0.74	0.08
	Female	84	0.90	0.10	13	--	--	58	0.55	0.07
	Total	186	0.97	0.07	25	0.66	0.13	143	0.65	0.05
V. Retinoblastoma	Male	40	0.41	0.06	9	--	--	65	0.55	0.07
	Female	33	0.35	0.06	9	--	--	47	0.41	0.06
	Total	73	0.38	0.04	18	0.47	0.11	112	0.48	0.05
VI. Renal	Male	67	0.68	0.08	7	--	--	56	0.49	0.07
	Female	82	0.88	0.10	22	1.20	0.26	79	0.72	0.08
	Total	149	0.77	0.06	29	0.77	0.14	135	0.60	0.05
VII. Hepatic Tumors	Male	9	--	--	<5	--	--	21	0.18	0.04
	Female	15	0.16	0.04	<5	--	--	20	0.19	0.04
	Total	24	0.13	0.03	<5	--	--	41	0.19	0.03
VIII. Malignant Bone	Male	65	0.67	0.08	9	--	--	39	0.45	0.07
	Female	56	0.62	0.08	5	--	--	49	0.64	0.09
	Total	121	0.65	0.06	14	--	--	88	0.54	0.06
IX. Soft Tissue Sarcoma	Male	95	0.97	0.10	19	1.06	0.24	88	0.91	0.10
	Female	66	0.72	0.09	14	--	--	89	0.95	0.10
	Total	161	0.85	0.07	33	0.93	0.16	177	0.93	0.07
X. Germ Cell, Trophoblastic and Other Gonadal	Male	37	0.38	0.06	6	--	--	61	0.64	0.08
	Female	43	0.47	0.07	6	--	--	62	0.75	0.10
	Total	80	0.42	0.05	12	--	--	123	0.69	0.06
XI. Epithelial and Other Carcinomas	Male	49	0.51	0.07	8	--	--	22	0.27	0.06
	Female	65	0.71	0.09	<5	--	--	44	0.56	0.08
	Total	114	0.61	0.06	12	--	--	66	0.41	0.05
XII. Other and Unspecified Malignancies	Male	<5	--	--	<5	--	--	<5	--	--
	Female	<5	--	--	<5	--	--	<5	--	--
	Total	5	--	--	<5	--	--	6	--	--

Rates based on fewer than 15 cases over this six-year period are not shown.
AAIR=average annual incidence rates per 100,000 for the six-year period, 1994-1999, age-adjusted to the 2000 U.S. Standard Population. SE=Standard error.
Prepared by the California Department of Health Services, Cancer Surveillance Section.

Appendix C

Childhood Cancer Six-Year Case Counts and Average Annual Age-Adjusted Incidence Rates (Ages 0-14), 1994-1999, with Twelve-Year Trends, by Major ICCC Category, Sex and Race/Ethnicity in California, 1988-1999

ICCC Category			Asian/Pacific Islander 1994-1999 0-14 Years			All Races Combined 1994-1999 0-14 Years			1988-1999 12-Year Trend in AAIR	
	Cancer Type	Sex	Cases	AAIR	SE	Cases	AAIR	SE	EAPC*	p
All Cancers Combined		Male	306	11.40	0.65	3,547	14.40	0.24	-0.8*	0.02
		Female	276	10.88	0.66	2,978	12.75	0.23	-1.1*	0.002
		Total	582	11.15	0.46	6,525	13.59	0.17	-1.0*	0.004
I.	Leukemia	Male	121	4.45	0.41	1,304	5.21	0.15	-0.3	0.67
		Female	91	3.53	0.37	1,029	4.32	0.14	-0.8	0.45
		Total	212	4.00	0.28	2,333	4.78	0.10	-0.5	0.50
I.a.	Acute Lymphocytic	Male	93	3.39	0.35	1,039	4.13	0.13	-0.8	0.35
		Female	66	2.57	0.32	803	3.35	0.12	-0.6	0.63
		Total	159	2.99	0.24	1,842	3.75	0.09	-0.7	0.45
II.	Lymphoma and Other Reticuloendothelial	Male	35	1.37	0.23	407	1.75	0.09	-2.0	0.05
		Female	17	0.68	0.17	205	0.94	0.07	-0.2	0.87
		Total	52	1.03	0.14	612	1.35	0.06	-1.4	0.06
III.	Central Nervous System	Male	43	1.63	0.25	678	2.77	0.11	-1.1	0.33
		Female	40	1.61	0.26	567	2.44	0.10	-1.6*	0.01
		Total	83	1.62	0.18	1,245	2.61	0.07	-1.3	0.10
IV.	Sympathetic Nervous System	Male	26	0.92	0.18	230	0.87	0.06	-1.8	0.07
		Female	14	--	--	174	0.70	0.05	-2.4	0.21
		Total	40	0.73	0.12	404	0.79	0.04	-2.0*	0.04
V.	Retinoblastoma	Male	11	--	--	128	0.48	0.04	1.8	0.50
		Female	10	--	--	104	0.41	0.04	0.5	0.73
		Total	21	0.38	0.08	232	0.44	0.03	1.3	0.43
VI.	Renal	Male	5	--	--	137	0.52	0.04	-3.0	0.11
		Female	17	0.63	0.15	201	0.81	0.06	-2.3	0.16
		Total	22	0.40	0.08	338	0.66	0.04	-2.5*	0.003
VII.	Hepatic Tumors	Male	7	--	--	40	0.16	0.02	-7.9*	0.003
		Female	6	--	--	41	0.17	0.03	-1.7	0.54
		Total	13	--	--	81	0.16	0.02	-5.0*	0.01
VIII.	Malignant Bone	Male	9	--	--	123	0.55	0.05	-2.9	0.20
		Female	12	--	--	124	0.59	0.05	-1.7	0.26
		Total	21	0.43	0.09	247	0.57	0.04	-2.1	0.09
IX.	Soft Tissue Sarcoma	Male	18	0.68	0.16	222	0.91	0.06	-0.6	0.66
		Female	15	0.60	0.16	189	0.83	0.06	-1.4	0.29
		Total	33	0.65	0.11	411	0.87	0.04	-0.9	0.37
X.	Germ-Cell, Trophoblastic, and Other Gonadal	Male	19	0.69	0.16	124	0.51	0.05	-1.6	0.31
		Female	37	1.50	0.25	149	0.66	0.05	-3.4*	0.01
		Total	56	1.09	0.15	273	0.58	0.04	-2.5*	0.004
XI.	Epithelial and Other Carcinomas	Male	7	--	--	90	0.40	0.04	-1.1	0.62
		Female	11	--	--	131	0.62	0.05	-0.7	0.58
		Total	18	0.37	0.09	221	0.51	0.03	-0.9	0.46
XII.	Other and Unspecified Malignancies	Male	<5	--	--	7	--	--	--	--
		Female	<5	--	--	8	--	--	--	--
		Total	<5	--	--	15	0.03	0.01	--	--

Rates based on fewer than 15 cases over this six-year period are not shown.
AAIR=average annual incidence rates per 100,000 for the six-year period, 1994-1999, age-adjusted to the 2000 U.S. Standard Population. SE=Standard error.
EAPC*=Estimated annual percent change over twelve-year period, 1988-1999. EAPCs considered statistically significant if P values < 0.05. EAPCs were calculated but not presented for categories with fewer than 25 cases over the twelve-year period.
Prepared by the California Department of Health Services, Cancer Surveillance Section.

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