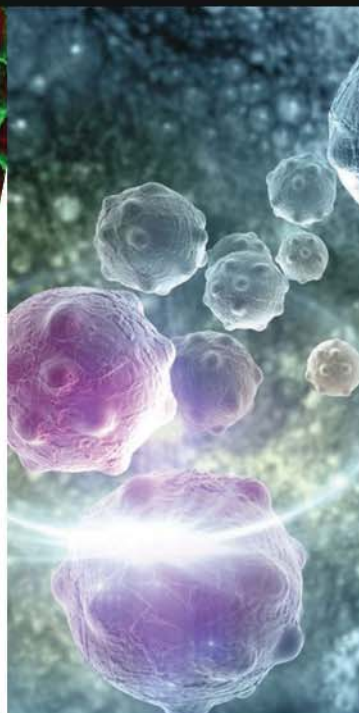
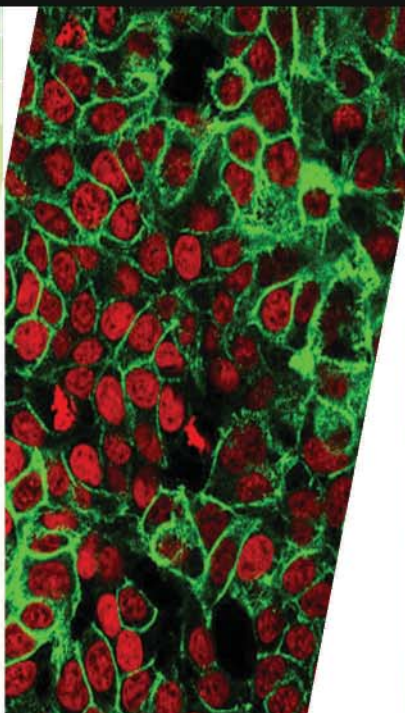


Cancer in California 1988-2013





This report was prepared by the CalCARES Program, Institute for Population Health Improvement, UC Davis Health System, for the Chronic Disease Surveillance and Research Branch, California Department of Public Health, pursuant to CDPH Grant Number 11-10828.

Chronic Disease Surveillance and Research Branch
California Department of Public Health
1631 Alhambra Boulevard, Suite 200
Sacramento, CA 95816
(916) 731-2500
<http://www.cdph.ca.gov> or <http://www.ccrca.org>

The CalCARES Program partners with the California Department of Public Health to manage the operations of the state-mandated California Cancer Registry program.

Suggested Citation:

Maguire FB, Giddings BM, Chen Y, Zhao QY, Morris CR, Parikh-Patel A, Kizer KW, Kwong SL, Snipes KP. Cancer in California, 1988-2013. Sacramento, CA: California Department of Public Health, Chronic Disease Surveillance and Research Branch, June 2016.

Copyright Information:

All material in this report is in the public domain and may be reproduced or copied without permission; citation as to source, however, is appreciated.

This and other California Cancer Registry and CalCARES publications are available at:

<http://www.cdph.ca.gov>

<http://www.ccrca.org>

and

<http://www.ucdmc.ucdavis.edu/iphi>

Production and design by Magdalena Burgos.

Prepared by

Fran B. Maguire, M.P.H.

CalCARES Program
Institute for Population Health Improvement
UC Davis Health System

Brenda M. Giddings, M.A.

CalCARES Program
Institute for Population Health Improvement
UC Davis Health System

Yi Chen

CalCARES Program
Institute for Population Health Improvement
UC Davis Health System

Quincy Y. Zhao

CalCARES Program
Institute for Population Health Improvement
UC Davis Health System

Cyllene R. Morris, D.V.M., Ph.D.

Research Program Director
CalCARES Program
Institute for Population Health Improvement
UC Davis Health System

Arti Parikh-Patel, Ph.D., M.P.H.

Program Director
CalCARES Program
Institute for Population Health Improvement
UC Davis Health System

Kenneth W. Kizer, M.D., M.P.H.

Distinguished Professor, UC Davis School of Medicine and
Betty Irene Moore School of Nursing;
Principal Investigator, CalCARES Program;
and
Director, Institute for Population Health Improvement
UC Davis Health System

Sandy L. Kwong, M.P.H.

Chronic Disease Surveillance and Research Branch
California Department of Public Health

Kurt P. Snipes, M.S., Ph.D., Chief

Chronic Disease Surveillance and Research Branch
California Department of Public Health



Edmund G. Brown Jr. Governor
State of California

Diana S. Dooley, Secretary
California Health and Human Services Agency

**Karen L. Smith, MD, MPH, Director &
State Public Health Officer**
California Department of Public Health

ACKNOWLEDGEMENTS AND DISCLAIMER

The collection of cancer incidence data used in this study was supported by the California Department of Public Health pursuant to California Health and Safety Code Section 103885; Centers for Disease Control and Prevention's (CDC) National Program of Cancer Registries, under cooperative agreement 5NU58DP003862-04/DP003862; the National Cancer Institute's Surveillance, Epidemiology and End Results Program under contract HHSN261201000140C awarded to the Cancer Prevention Institute of California, contract HHSN261201000035C awarded to the University of Southern California, and contract HHSN261201000034C awarded to the Public Health Institute. The ideas and opinions expressed herein are those of the author(s) and do not necessarily reflect the opinions of the State of California, Department of Public Health, the National Cancer Institute, and the Centers for Disease Control and Prevention or their Contractors and Subcontractors.

Inquiries regarding the content of this report should be directed to:

California Cancer Reporting and Epidemiologic Surveillance (CalCARES) Program
c/o Institute for Population Health Improvement
1631 Alhambra Boulevard, Suite 200
Sacramento, CA 95816
(916) 731-2500
<http://www.cdph.ca.gov> or <http://www.ccrca.org>

Content

California Cancer Rates in 2013	2
Overview	2
Leading Cancer Sites – by Sex	3
Leading Cancer Sites – by Sex and Race/Ethnicity	6
Cancer Incidence and Mortality Trends (2003-2012)	9
Five-Year Relative Survival by Stage at Diagnosis (2004-2008)	12
Childhood (Ages 0-14 years) and Adolescent (Ages 15-19 years) Cancers	14
Incidence Rates and Number of Cases (2009-2013) by ICCC Group	14
Incidence Trends by Sex, Cancer Type and Age Group (1988-2012)	17
Five-Year Relative Survival (2004-2008) by ICCC Group	21
Technical Notes	22



CALIFORNIA CANCER RATES IN 2013

Overview

Age-adjusted cancer incidence in California is 14 percent lower in 2013 than in 1988.

A total of 158,592 new cases of cancer were diagnosed among California residents in 2013. The overall age-adjusted cancer incidence (new cases) rate in California was 398.0 cases per 100,000 persons in 2013, compared to 463.0 in 1988 when statewide cancer reporting began, or 14 percent lower in 2013 than in 1988. This means that there were approximately 25,000 fewer new cancer cases in California in 2013 than there would have been if the incidence rate had remained the same as in 1988.¹

The age-adjusted cancer incidence rate among California females dropped from 416.4 cases per 100,000 females in 1988, to 377.2 in 2013, a decline of 9.4 percent.

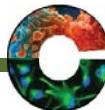
The age-adjusted cancer incidence rate among males is complicated by changes in prostate screening procedures. The age-adjusted incidence rate of cancer among males increased from 545.0 cases per 100,000 in 1989, to 628.6 in 1992 (due in part to the introduction and widespread use of the prostate specific antigen [PSA] test in the late 1980s), and then decreased in subsequent years to 430.9 per 100,000 in 2013, the lowest since 1988. The overall change between 1988 and 2013 was a decline of 21 percent.

The overall cancer mortality (death) rate has decreased by 28.7 percent since 1988.

Cancer of all types remained the second leading cause of death in California in 2013, accounting for 57,503 deaths. Encouragingly, the overall cancer mortality (death) rate has decreased by 28.7 percent since 1988, falling from 205.4 cancer-related deaths per 100,000 persons in 1988, to 146.5 in 2013 - a drop of 32.8 percent for males and 26.6 percent for females. This means that there were approximately 23,000 fewer deaths from cancer in 2013 than there would have been if the mortality rate had stayed the same as in 1988.¹

While cancer-related mortality rates have declined for all four major racial/ethnic groups in the state since 1988, the risk of being diagnosed with or dying from cancer continues to vary by race/ethnicity. In 2013, African American males had the highest overall cancer incidence rate (489.1 cases per 100,000 males) and mortality rate (228.8 deaths per 100,000 males), followed by non-Hispanic white males (473.3 cases and 185.3 deaths per 100,000 persons). Non-Hispanic white females had the highest overall cancer incidence rate (421.2 cases per 100,000 females), while African American females had the highest mortality rate (165.8 deaths per 100,000 females).

1. This calculation assumes the population age distribution in California has remained constant since 1988.



Leading Cancer Sites - By Sex

Tables 1-4 show the ten most common types of cancer incidence and mortality among Californians in 2013. These ten cancers accounted for 78.3 percent of all new cancer diagnoses and 75.1 percent of cancer-related deaths. Breast cancer remained the most common cancer among females, accounting for 32.1 percent of new cancers (25,632 cases) in 2013. Prostate cancer was the most common cancer among males, accounting for 23.7 percent of new cancers (18,655 cases) in California males in 2013.

For both males and females, cancer of the lung and bronchus was the second most common cancer and the leading cause of cancer-related deaths, accounting for nearly one of every five cancer-related deaths for males (21.8 percent) and females (21.4 percent). A total of 16,636 Californians were diagnosed with cancer of the lung and bronchus in 2013, and 12,408 died from the disease.

Colorectal cancer, the third most commonly occurring cancer among both males and females in 2013, was also the third leading cause of cancer-related deaths. Colorectal cancer accounted for 9.3 and 8.4 percent of newly diagnosed cancers in California males (7,289 new cases) and females (6,744 new cases), respectively, and 8.9 and 9.1 percent of cancer-related deaths in males (2,645 deaths) and females (2,512 deaths), respectively.

Breast cancer remained the most common cancer diagnosed among females, accounting for 32.1 percent of new cancers (25,632 cases) in 2013.



Among Males in California
prostate cancer was the most commonly diagnosed cancer in 2013...

TABLE 1

Ten Most Common Types of Cancer Incidence Among California Males, 2013

Rank	Cancer Site	Count	Rate
1	Prostate	18,655	98.0
2	Lung and Bronchus	8,371	48.4
3	Colorectal	7,289	39.9
4	Urinary Bladder	5,115	30.2
5	Melanoma	5,359	29.8
6	Non-Hodgkin Lymphoma	4,050	22.6
7	Kidney and Renal Pelvis	3,689	19.7
8	Oral Cavity and Pharynx	3,047	15.9
9	Leukemia	2,830	15.9
10	Liver and Intrahepatic Bile Duct	2,874	14.6

Rates are per 100,000 and age-adjusted to the 2000 US Standard Population.
Source: California Cancer Registry, California Department of Public Health

... while cancer of the lung and bronchus was the leading cause of cancer-related death.

TABLE 2

Ten Most Common Types of Cancer Mortality Among California Males, 2013

Rank	Cancer Site	Count	Rate
1	Lung and Bronchus	6,482	38.1
2	Prostate	3,111	19.5
3	Colorectal	2,645	15.2
4	Pancreas	2,057	11.8
5	Liver and Intrahepatic Bile Duct	2,164	11.5
6	Leukemia	1,390	8.4
7	Non-Hodgkin Lymphoma	1,181	7.0
8	Urinary Bladder	1,120	6.9
9	Esophagus	979	5.6
10	Brain and Other Nervous System	967	5.3

Rates are per 100,000 and age-adjusted to the 2000 US Standard Population.
Source: California Cancer Registry, California Department of Public Health

TABLE 3

Ten Most Common Types of Cancer Incidence Among California Females, 2013

Rank	Cancer Site	Count	Rate
1	Breast	25,632	121.5
2	Lung and Bronchus	8,265	38.6
3	Colorectal	6,744	31.3
4	Uterus	5,302	24.2
5	Thyroid	3,860	19.4
6	Melanoma	3,324	15.9
7	Non-Hodgkin Lymphoma	3,089	14.6
8	Ovary	2,418	11.4
9	Pancreas	2,214	10.2
10	Kidney and Renal Pelvis	1,989	9.3

Rates are per 100,000 and age-adjusted to the 2000 US Standard Population.
Source: California Cancer Registry, California Department of Public Health

Among Females in California breast cancer remained the most commonly cancer diagnosed in 2013...

TABLE 4

Ten Most Common Types of Cancer Mortality Among California Females, 2013

Rank	Cancer Site	Count	Rate
1	Lung and Bronchus	5,926	27.5
2	Breast	4,361	20
3	Colorectal	2,512	11.3
4	Pancreas	2,039	9.2
5	Ovary	1,556	7.2
6	Leukemia	1,063	4.9
7	Liver and Intrahepatic Bile Duct	1,001	4.6
8	Uterus	992	4.5
9	Non-Hodgkin Lymphoma	881	4
10	Brain and Other Nervous System	741	3.5

Rates are per 100,000 and age-adjusted to the 2000 US Standard Population.
Source: California Cancer Registry, California Department of Public Health

... while cancer of the lung and bronchus was the leading cause of cancer-related death.



Leading Cancer Sites – by Sex and Race/Ethnicity

Tables 5 and 6 show the ten most commonly diagnosed cancers in California from 2009-2013 among males and females in 15 race/ethnicity groups: African American, American Indian/Alaska Native, Chinese, Filipino, Hawaiian, Hispanic, Japanese, Kampuchean, Korean, Laotian/Hmong, Pacific Islander, South Asian, Thai, Vietnamese, and non-Hispanic white.

Prostate cancer was the most commonly diagnosed cancer in most of the racial/ethnic groups for males.

Prostate cancer was the most commonly diagnosed cancer in most of the racial/ethnic groups for males, with lung and bronchus and colorectal cancers ranking second or third. Exceptions included: Kampuchean males, for whom colorectal cancer was the most common cancer, followed by liver and intrahepatic bile duct (IBD) and lung and bronchus cancer; Korean males, for whom colorectal cancer was the most common cancer, followed by prostate and lung and bronchus cancers; Laotian/Hmong males, for whom lung and bronchus cancer was most common, followed by liver and IBD and colorectal cancers; Thai males, for whom liver and IBD cancer was the second most common; and Vietnamese males, for whom lung and bronchus cancer was most common, followed by liver and IBD and prostate cancers.

Breast cancer was the most commonly diagnosed cancer among each of the fifteen racial/ethnic groups for females.

Breast cancer was the most commonly diagnosed cancer among each of the fifteen racial/ethnic groups for females, with lung and bronchus cancer and colorectal cancer ranking second or third for most of the race/ethnicity groups. Exceptions included: uterus cancer, which was the second most common cancer among Pacific Islander and Hawaiian females and the third most common cancer among Filipino, Hispanic, and South Asian females; and thyroid cancer which was the second most common cancer among South Asian females.

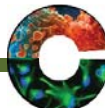


TABLE 5
Ten Most Common Newly Diagnosed Types of Cancer among Males by Race/Ethnicity - California, 2009-2013

Male										
Rank										
	1	2	3	4	5	6	7	8	9	10
African American	Prostate (9,980)	Lung and Bronchus (3,506)	Colorectal (2,769)	Kidney and Renal Pelvis (1,305)	Liver and IBD [†] (1,043)	Urinary Bladder (989)	Non-Hodgkin Lymphoma (916)	Pancreas (799)	Oral Cavity and Pharynx (735)	Melanoma (731)
American Indian/ Alaska Native	Prostate (412)	Lung and Bronchus (237)	Colorectal (193)	Liver and IBD [†] (132)	Kidney and Renal Pelvis (129)	Non-Hodgkin Lymphoma (98)	Oral Cavity and Pharynx (86)	Urinary Bladder (84)	Leukemia (61)	Pancreas (52)
Chinese	Prostate (2,210)	Lung and Bronchus (1,607)	Colorectal (1,446)	Liver and IBD [†] (775)	Non-Hodgkin Lymphoma (554)	Urinary Bladder (525)	Stomach (472)	Oral Cavity and Pharynx (459)	Pancreas (343)	Kidney and Renal Pelvis (322)
Filipino	Prostate (2,507)	Lung and Bronchus (1,476)	Colorectal (1,155)	Non-Hodgkin Lymphoma (479)	Liver and IBD [†] (455)	Kidney and Renal Pelvis (450)	Urinary Bladder (285)	Leukemia (278)	Thyroid (271)	Pancreas (265)
Hawaiian	Prostate (123)	Lung and Bronchus (78)	Colorectal (68)	Non-Hodgkin Lymphoma (30)	Urinary Bladder (22)	Pancreas (21)	Kidney and Renal Pelvis (21)	Oral Cavity and Pharynx (20)	Liver and IBD [†] (20)	Leukemia (14)
Hispanic	Prostate (17,938)	Colorectal (7,413)	Lung and Bronchus (4,924)	Kidney and Renal Pelvis (4,061)	Non-Hodgkin Lymphoma (3,987)	Liver and IBD [†] (3,881)	Leukemia (3,054)	Urinary Bladder (2,720)	Stomach (2,408)	Testis (2,117)
Japanese	Prostate (743)	Colorectal (511)	Lung and Bronchus (413)	Urinary Bladder (245)	Stomach (205)	Non-Hodgkin Lymphoma (191)	Pancreas (151)	Kidney and Renal Pelvis (126)	Liver and IBD [†] (118)	Oral Cavity and Pharynx (97)
Kampuchean	Colorectal (74)	Liver and IBD [†] (70)	Lung and Bronchus (64)	Prostate (37)	Oral Cavity and Pharynx (24)	Non-Hodgkin Lymphoma (22)	Leukemia (16)	Pancreas (15)	Other Biliary (9)	Kidney and Renal Pelvis (9)
Korean	Colorectal (494)	Lung and Bronchus (433)	Prostate (431)	Stomach (377)	Liver and IBD [†] (287)	Urinary Bladder (208)	Kidney and Renal Pelvis (130)	Pancreas (123)	Non-Hodgkin Lymphoma (115)	Thyroid (95)
Laotian/ Hmong	Lung and Bronchus (89)	Liver and IBD [†] (83)	Colorectal (62)	Stomach (37)	Prostate (31)	Non-Hodgkin Lymphoma (29)	Oral Cavity and Pharynx (28)	Pancreas (19)	Leukemia (19)	Other Biliary (11)
Pacific Islander [^]	Prostate (202)	Lung and Bronchus (112)	Colorectal (79)	Liver and IBD [†] (48)	Oral Cavity and Pharynx (41)	Non-Hodgkin Lymphoma (39)	Kidney and Renal Pelvis (36)	Urinary Bladder (34)	Leukemia (32)	Stomach (26)
South Asian [‡]	Prostate (754)	Colorectal (276)	Lung and Bronchus (223)	Non-Hodgkin Lymphoma (204)	Urinary Bladder (167)	Leukemia (155)	Oral Cavity and Pharynx (133)	Kidney and Renal Pelvis (121)	Liver and IBD [†] (90)	Brain and ONS [§] (82)
Thai	Prostate (75)	Liver and IBD [†] (39)	Colorectal (37)	Lung and Bronchus (32)	Non-Hodgkin Lymphoma (23)	Stomach (11)	Urinary Bladder (9)	Kidney and Renal Pelvis (9)	Oral Cavity and Pharynx (9)	Thyroid (7) Leukemia (7)
Vietnamese	Lung and Bronchus (797)	Liver and IBD [†] (684)	Prostate (624)	Colorectal (593)	Non-Hodgkin Lymphoma (224)	Stomach (192)	Oral Cavity and Pharynx (182)	Leukemia (147)	Kidney and Renal Pelvis (139)	Pancreas (132)
Non-Hispanic White	Prostate (63,482)	Lung and Bronchus (29,325)	Colorectal (21,765)	Melanoma of the Skin (21,317)	Urinary Bladder (19,594)	Non-Hodgkin Lymphoma (12,070)	Kidney and Renal Pelvis (10,334)	Oral Cavity and Pharynx (9,879)	Leukemia (8,484)	Pancreas (6,986)

[^] Pacific Islander includes the following: Micronesian, Chamorran, Guamanian, Polynesian, Tahitian, Samoan, Tongan, Melanesian, Fiji Islander, New Guinean, and Pacific Islander not specified.

[‡] South Asian includes the following: Asian Indian and Pakistani.

[†] IBD: Intrahepatic Bile Duct

[§] ONS: Other Nervous System

Source: California Cancer Registry, California Department of Public Health

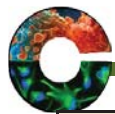


TABLE 6

Ten Most Common Newly Diagnosed Types of Cancer among Females by Race/Ethnicity - California, 2009-2013

Female

Rank

	1	2	3	4	5	6	7	8	9	10
African American	Breast (7,933)	Lung and Bronchus (3,038)	Colorectal (2,740)	Uterus (1,610)	Pancreas (844)	Thyroid (765)	Kidney and Renal Pelvis (759)	Non-Hodgkin Lymphoma (753)	Myeloma (656)	Ovary (612)
American Indian/ Alaska Native	Breast (626)	Lung and Bronchus (217)	Colorectal (193)	Uterus (168)	Non-Hodgkin Lymphoma (79)	Thyroid (79)	Kidney and Renal Pelvis (69)	Leukemia (67)	Cervix Uteri (67)	Ovary (64)
Chinese	Breast (3,735)	Colorectal (1,317)	Lung and Bronchus (1,265)	Uterus (713)	Thyroid (622)	Non-Hodgkin Lymphoma (444)	Ovary (387)	Stomach (379)	Pancreas (337)	Liver and IBD [†] (327)
Filipino	Breast (4,915)	Colorectal (1,181)	Uterus (1,163)	Lung and Bronchus (1,050)	Thyroid (1,026)	Non-Hodgkin Lymphoma (516)	Ovary (413)	Pancreas (375)	Cervix (293)	Leukemia (272)
Hawaiian	Breast (193)	Uterus (59)	Lung and Bronchus (49)	Colorectal (46)	Thyroid (26)	Ovary (20)	Non-Hodgkin Lymphoma (16)	Cervix (15)	Leukemia (15)	Stomach (13)
Hispanic	Breast (22,422)	Colorectal (6,309)	Uterus (5,272)	Thyroid (5,053)	Lung and Bronchus (4,479)	Non-Hodgkin Lymphoma (3,466)	Kidney and Renal Pelvis (2,783)	Ovary (2,732)	Cervix (2,646)	Leukemia (2,400)
Japanese	Breast (1,528)	Colorectal (591)	Lung and Bronchus (493)	Uterus (237)	Pancreas (217)	Non-Hodgkin Lymphoma (187)	Stomach (181)	Thyroid (143)	Liver and IBD [†] (113)	Urinary Bladder (104)
Kampuchean	Breast (92)	Lung and Bronchus (51)	Colorectal (46)	Thyroid (27)	Liver and IBD [†] (27)	Cervix (27)	Uterus (21)	Ovary (18)	Stomach (16)	Pancreas (11)
Korean	Breast (981)	Colorectal (474)	Lung and Bronchus (300)	Thyroid (281)	Stomach (255)	Pancreas (145)	Uterus (144)	Liver and IBD [†] (130)	Ovary (129)	Non-Hodgkin Lymphoma (108)
Laotian/ Hmong	Breast (83)	Colorectal (58)	Lung and Bronchus (38)	Uterus (35)	Thyroid (29)	Liver and IBD [†] (28)	Oral Cavity and Pharynx (24)	Cervix (20)	Non-Hodgkin Lymphoma (19)	Pancreas (14)
Pacific Islander [*]	Breast (403)	Uterus (203)	Lung and Bronchus (93)	Colorectal (90)	Thyroid (73)	Cervix (49)	Ovary (45)	Stomach (30)	Leukemia (30)	Non-Hodgkin Lymphoma (26)
South Asian	Breast (1,186)	Thyroid (244)	Uterus (214)	Colorectal (184)	Ovary (146)	Non-Hodgkin Lymphoma (128)	Lung and Bronchus (117)	Leukemia (97)	Brain and ONS [§] (67)	Oral Cavity and Pharynx (64)
Thai	Breast (164)	Colorectal (60)	Lung and Bronchus (46)	Uterus (31)	Thyroid (26)	Liver and IBD [†] (16)	Non-Hodgkin Lymphoma (16)	Cervix (15)	Ovary (14)	Pancreas (14)
Vietnamese	Breast (1,263)	Colorectal (510)	Lung and Bronchus (465)	Thyroid (300)	Uterus (235)	Liver and IBD [†] (206)	Non-Hodgkin Lymphoma (166)	Stomach (160)	Ovary (151)	Cervix (132)
Non-Hispanic White	Breast (75,768)	Lung and Bronchus (29,727)	Colorectal (20,399)	Uterus (14,874)	Melanoma of the Skin (13,063)	Non-Hodgkin Lymphoma (9,225)	Thyroid (8,828)	Ovary (7,107)	Pancreas (6,352)	Urinary Bladder (5,760)

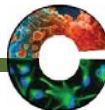
^{*} Pacific Islander includes the following: Micronesian, Chamorroan, Guamanian, Polynesian, Tahitian, Samoan, Tongan, Melanesian, Fiji Islander, New Guinean, and Pacific Islander not specified.

[†] South Asian includes the following: Asian Indian and Pakistani.

[‡] IBD: Intrahepatic Bile Duct

[§] ONS: Other Nervous System

Source: California Cancer Registry, California Department of Public Health



Cancer Incidence and Mortality Trends in California, 2003-2012

Figures 1-2 depict the trends in cancer incidence and mortality rates for the most common cancers by sex (for all races combined) over the most recent 10-year period (2003 to 2012). Looking at cancer trends over the most recent 10-year period allows any new or emerging trends to become evident. A bar to the right of zero (i.e., a positive percentage) means that the rate, on average, increased, while a bar to the left (i.e., a negative percentage) means that the rate decreased. An asterisk indicates that the change was statistically significant.

Although cancer remains a major cause of illness and death in California, the incidence and mortality rates for many of the common types of cancer declined among both males and females from 2003-2012. While not all of the reasons for these declines are known, they may be due, in part, to lower rates of smoking and the decline of smoking-related cancers (e.g., cancers of the lung and bronchus, larynx, stomach, cervix uteri, and urinary bladder).

For males, six common cancers showed statistically significant declines in incidence rates since 2003. These include: lung and bronchus, prostate, colorectal, larynx, urinary bladder, and stomach cancers. All, except for urinary bladder cancer, also had statistically significant declines in mortality. The incidence rates of seven common cancers increased significantly in males since 2003: thyroid, liver and IBD, melanoma, myeloma, kidney and renal pelvis, testis, and oral cavity and pharynx. Of these, only cancer of the liver and IBD showed a statistically significant increase in mortality during the time period while melanoma of the skin and kidney and renal pelvis cancer had statistically significant declines in mortality.

Cancer Incidence Trends

Males:

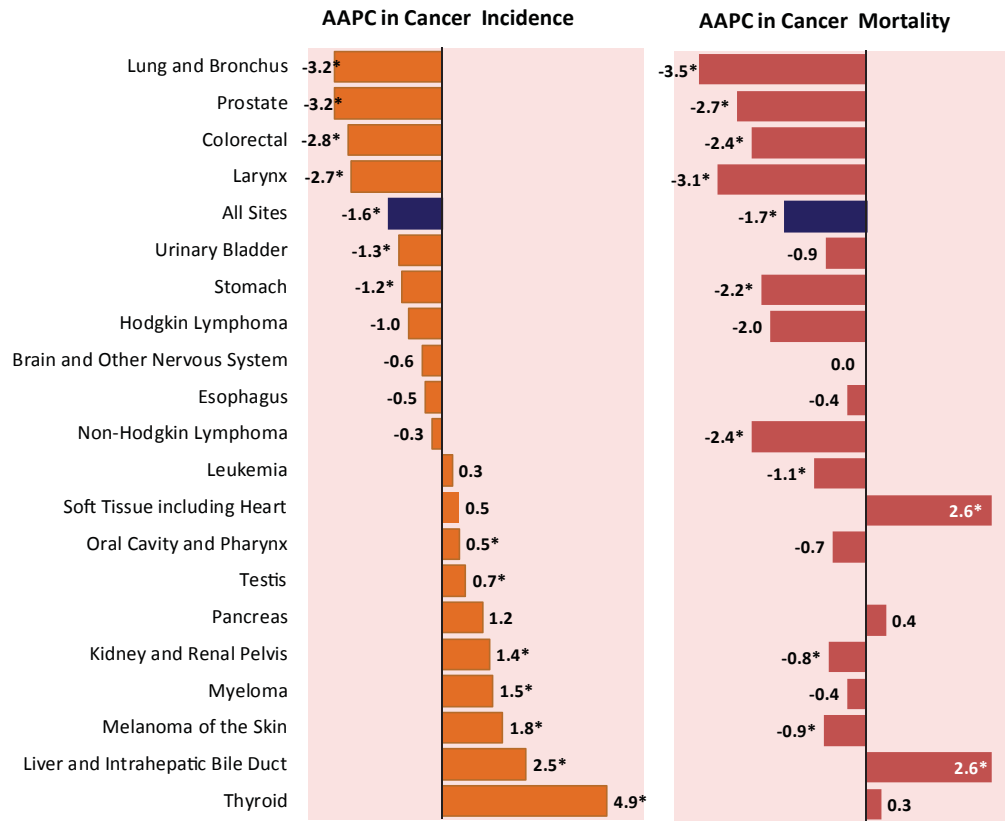
Six common cancers showed statistically significant declines in incidence rates and seven showed statistically significance increases since 2003 in California.



Male Incidence and Mortality Trends

Figure 1: Male

Male Average Annual Percent Change (AAPC) in Cancer Incidence and Mortality Trends, California 2003-2012

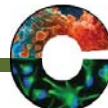


*AAPC is significantly different from zero at p<0.05.
 Rates are per 100,000 and age-adjusted to the 2000 U.S. Standard Population.
 For testicular cancer mortality, the AAPC could not be calculated due to small counts.
 Source: California Cancer Registry, California Department of Public Health

Although cancer of the soft tissue including heart, leukemia, and non-Hodgkin lymphoma did not have statistically significant changes in incidence in males, they did have significant changes in mortality with a significant increase for soft tissue including heart cancer and significant decreases for leukemia and non-Hodgkin lymphoma.

Females:
 Six common cancers showed statistically significant declines in incidence rates and four showed significant increases since 2003 in California.

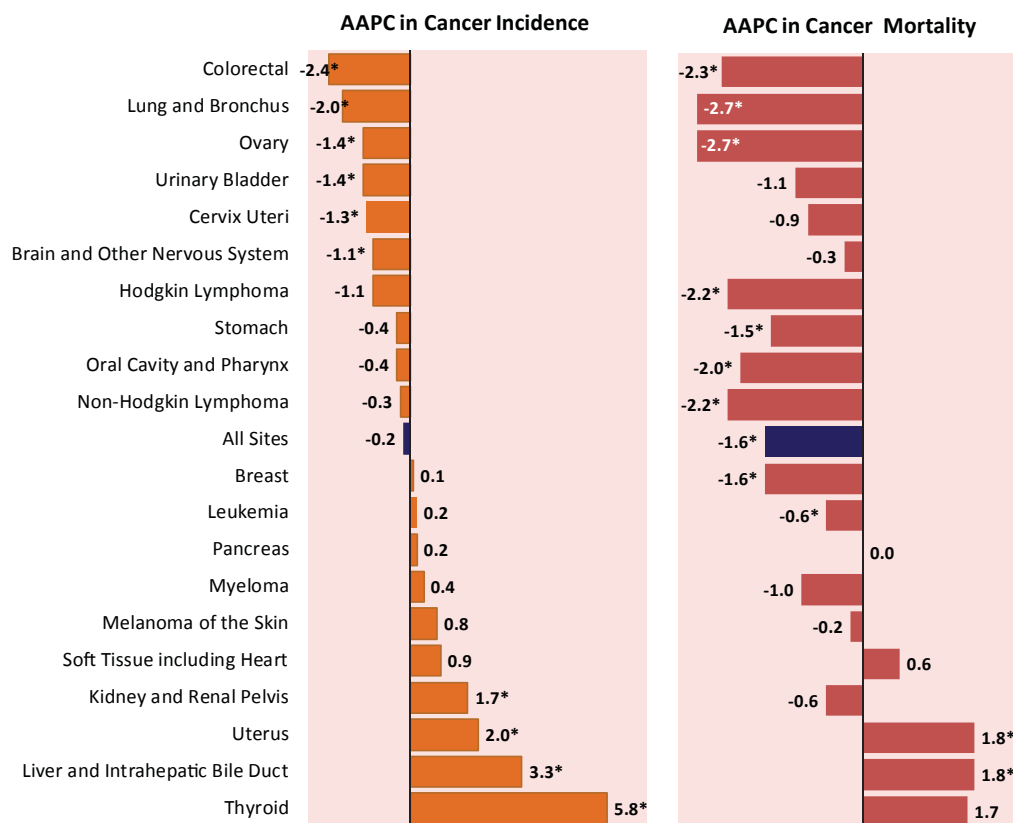
For females, six common cancers showed statistically significant declines in incidence rates since 2003. These include: colorectal, lung and bronchus, ovary, urinary bladder, cervix uteri, and brain and other nervous system. Three of these cancers (colorectal, lung and bronchus, and ovarian) also showed statistically significant declines in mortality. Significant declines in mortality were also seen in the following cancers despite no significant changes in incidence: Hodgkin lymphoma, stomach, oral cavity and pharynx, non-Hodgkin lymphoma, breast, and leukemia. The incidence rates of four common cancers increased significantly in females since 2003: thyroid, liver and IBD, uterus, and kidney and renal pelvis. Of these, cancers of the liver



and IBD and uterus both showed statistically significant increases in mortality over the time period. In most cases, an increase in the mortality rate is due to a corresponding increase in the incidence rate of the cancer type.

Female Incidence and Mortality Trends

Figure 2: Female
Female Average Annual Percent Change (AAPC) in Cancer Incidence and Mortality Trends, California 2003-2012



*AAPC is significantly different from zero at p<0.05.
Rates are per 100,000 and age-adjusted to the 2000 U.S. Standard Population.
Source: California Cancer Registry, California Department of Public Health

For more details about these cancer trends and those of other cancer sites, please see “Trends in Cancer Incidence and Mortality in California, 1988-2010” (now available at the UC Davis Institute for Population Health Improvement [IPHI] website: https://www.ucdmc.ucdavis.edu/iphi/resources/TrendsReport_web.pdf).



Over the past several decades in California, five-year relative survival has improved for many types of cancer.

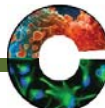
Five-Year Relative Survival By Stage at Diagnosis, 2004-2008

Cancer survival is typically expressed as a rate or percentage of all the persons diagnosed with cancer during a particular time period who survive for a defined number of years after diagnosis. Five-year relative survival estimates the probability that an individual will not die from a given cancer during the five years after diagnosis, after adjustment for the expected mortality from other causes. Over the past several decades in California, five-year relative survival has improved for many types of cancer.

One of the strongest predictors of survival is the stage at which the cancer is diagnosed. Stage refers to the degree that the cancer has spread when diagnosed. The following terms are used to describe the different stages at diagnosis in this report:

- Localized:** The tumor has broken through the first layer of cells (the basement membrane), but is still confined to the organ in which it is growing.
- Regional:** The tumor has spread to lymph nodes or adjacent tissues.
- Distant:** The tumor has spread to other parts of the body (metastasized).

Table 7 presents data on five-year relative survival for the most common types of cancer incidence and mortality for Californians diagnosed between 2004 and 2008. Five-year relative survival is broken out for each cancer type by stage at diagnosis as well as for all stages combined. The percentages listed in the table represent the probability that an individual will not die from a given cancer during the five years after diagnosis.



Cancer Type	All Stages	Localized	Regional	Distant
Breast (Female)	91.2%	99.3%	85.9%	28.7%
Brain and Other Nervous System	33.7%	36.9%	21.9% [^]	
Cervix Uteri	70.2%	92.5%	59.9%	18.4%
Colorectal	67.6%	92.0%	71.9%	13.8%
Uterus	83.4%	96.2%	69.7%	18.7%
Esophagus	17.7%	38.3%	21.2%	3.9%
Kidney and Renal Pelvis	73.5%	92.2%	65.4%	12.3%
Leukemia	58.1%	N/A – All leukemias are staged as distant disease; thus survival cannot be calculated for other stages.		58.1%
Liver and Intrahepatic Bile Duct	19.8%	31.3%	12.0%	3.4%
Lung and Bronchus	18.0%	57.1%	28.5%	4.6%
Melanoma	92.0%	98.7%	63.5%	17.2%
Non-Hodgkin Lymphoma	69.9%	83.0%	72.9%	62.0%
Oral Cavity and Pharynx	66.5%	85.1%	64.6%	39.5%
Ovary	49.4%	91.7%	76.5%	30.6%
Pancreas	7.6%	29.0%	10.4%	2.5%
Prostate	99.7%	100.0%	100.0%	30.6%
Stomach	30.6%	67.2%	31.7%	4.9%
Testis	94.4%	98.9%	95.9%	70.6%
Thyroid	97.7%	99.9%	97.8%	57.4%
Urinary Bladder	59.7%	71.5%	39.4%	5.7%

* Follow-up is through December 2013. Cancers that were unstaged at time of diagnosis are excluded.
[^] For Brain and Other Nervous System cancers, regional and distant stages were combined.
 Source: California Cancer Registry, California Department of Public Health

Percentages listed in Table 7 represent the probability that an individual will not die from a given cancer during the five-years after diagnosis.



Childhood (Ages 0-14 Years) and Adolescent (Ages 15-19 Years) Cancers

Children and adolescents diagnosed with cancer in California between 2004 and 2008 had a five-year relative survival of nearly 80 percent.

In each year from 2009 to 2013, nearly 2,000 children and adolescents were diagnosed with cancer in California. These cases represent just over 1 percent of all new cancers diagnosed among California residents during this time period. Although incidence rates for childhood and adolescent cancers have increased since 1988, progress in the treatment of these cancers has resulted in improved five-year relative survival. Overall, children and adolescents diagnosed with cancer in California between 2004 and 2008 had a five-year relative survival of over 80 percent.

Incidence and Number of Cases (2009-2013) by ICCC Group

Childhood and adolescent cancers are categorized differently than adult cancers; they are categorized according to the International Classification of Childhood Cancer (ICCC). The classification of childhood cancer is based on the form and structure of the tumor (commonly referred to as tumor morphology) and primary site, with an emphasis on morphology. Adult cancers are also based on morphology and primary site but the emphasis is on primary site (e.g., breast, lung, etc.). The ICCC is broken down into the following twelve site groups²:

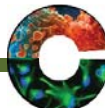
- I. Leukemias, myeloproliferative diseases, and myelodysplastic diseases
- II. Lymphomas and reticuloendothelial neoplasms
- III. CNS (central nervous system) and miscellaneous intracranial and intraspinal neoplasms
- IV. Neuroblastoma and other peripheral nervous cell tumors
- V. Retinoblastoma
- VI. Renal tumors
- VII. Hepatic tumors
- VIII. Malignant bone tumors
- IX. Soft tissue and other extraosseous sarcomas
- X. Germ cell tumors, trophoblastic tumors, and neoplasms of gonads
- XI. Other malignant epithelial neoplasms and malignant melanomas
- XII. Other and unspecified malignant neoplasms

Leukemias were the most commonly diagnosed cancer among children (ages 0-14 years) between 2009 and 2013.

Leukemias were the most commonly diagnosed cancer group among children (ages 0-14 years) between 2009 and 2013 (Figure 3).³ They represented 36 percent of the total cancers diagnosed among children. CNS and miscellaneous intracranial and intraspinal neoplasms were the second most diagnosed cancer group, constituting 22 percent of all childhood cancers in California. For additional data about childhood

2. For additional information about the ICCC variable definitions, please see the following link: <http://seer.cancer.gov/iccc/iccc-who2008.html>

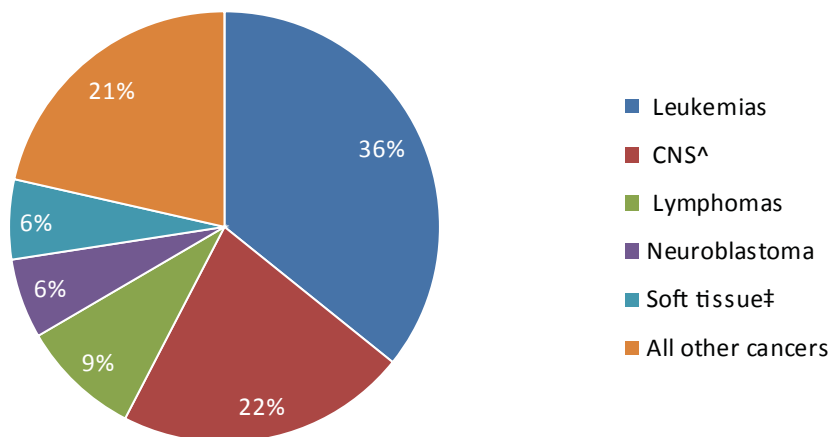
3. Due to the small number of cases per year, incidence rates and counts for childhood and adolescent cancers are typically calculated over the most recent 5-year period. This provides more stable results and the best current picture of the disease.



cancer incidence rates and case counts (2009-2013) for each cancer group, see Table 8. For adolescents (ages 15-19), other malignant epithelial neoplasms and melanomas were the most commonly diagnosed cancer group followed by CNS and miscellaneous intracranial and intraspinal neoplasms (Figure 4). For additional data about adolescent cancer incidence rates and case counts (2009-2013)

Figure 3: Cancer Types, Ages 0-14 Years

Distribution of Cancer Types among Children Ages 0-14 Years in California, 2009-2013[§]



[§]Includes myelodysplastic syndromes and Group III benign brain/CNS tumors.

[^]CNS includes miscellaneous intracranial and intraspinal neoplasms.

[‡]Soft tissue includes other extraosseous sarcomas.

Source: California Cancer Registry, California Department of Public Health

TABLE 8		
Childhood Cancer (0-14 Years) Average Incidence Rates and Counts in California, Both Sexes, 2009-2013		
Cancer Type	Rate	Count
All cancers combined (including benign brain/CNS tumors)	168.7	6,455
All cancers combined (excluding benign brain/CNS tumors)	160.7	6,152
Leukemias, myeloproliferative & myelodysplastic diseases	60.2	2,310
CNS and miscellaneous intracranial and intraspinal neoplasms	37.0	1,409
Lymphomas and reticuloendothelial neoplasms	15.3	579
Soft tissue and other extraosseous sarcomas	10.1	385
Neuroblastoma and other peripheral nervous cell tumors	10.0	387
Renal tumors	7.7	300
Other malignant epithelial neoplasms and melanomas	7.6	287
Malignant bone tumors	6.4	242
Germ cell, trophoblastic tumors, neoplasms of gonads	6.4	243
Retinoblastoma	4.3	169
Hepatic tumors	3.1	119
Other and unspecified malignant neoplasms	0.6	25

Rates are per 1,000,000 and age-adjusted to the 2000 US Std Population
 Source: California Cancer Registry, California Department of Public Health

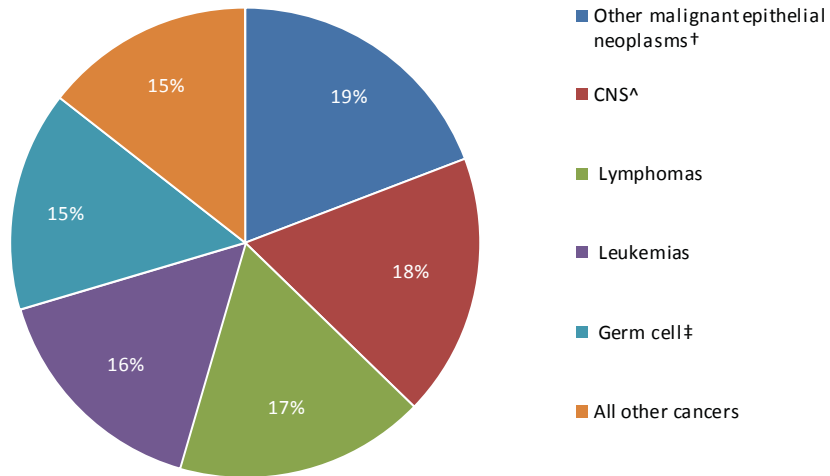


for each cancer group, see Table 9. Of note, childhood and adolescent cancer incidence rates are presented as rates per 1,000,000 persons, while adult cancer incidence rates (as presented earlier in this report) are per 100,000 persons.

For children ages 15-19 years, the most commonly diagnosed types of cancer between 2009 and 2013 were other malignant epithelial neoplasms and melanomas, representing 19 percent of all adolescent cancer diagnoses.

Figure 4: Cancer Types, Ages 15-19 Years

Distribution of Cancer Types among Adolescents Ages 15-19 Years in California, 2009-2013[§]



[§]Includes myelodysplastic syndromes and Group III benign brain/CNS tumors.

[†]Includes melanomas.

[^]CNS includes miscellaneous intracranial and intraspinal neoplasms.

[‡]Germ cell includes trophoblastic tumors and neoplasms of gonads.

Source: California Cancer Registry, California Department of Public Health

TABLE 9

Adolescent Cancer (15-19 Years) Average Incidence Rates and Counts in California, Both Sexes, 2009-2013
(including myelodysplastic syndromes and benign brain/CNS tumors)

Cancer Type	Rate	Count
All cancers combined (including benign brain/CNS tumors)	240.4	3,305
All cancers combined (excluding benign brain/CNS tumors)	215.5	2,962
Other malignant epithelial neoplasms and melanomas	46.1	634
CNS and miscellaneous intracranial and intraspinal neoplasms	43.4	597
Lymphomas and reticuloendothelial neoplasms	41.5	571
Leukemias, myeloproliferative & myelodysplastic diseases	38.2	525
Germ cell, trophoblastic tumors, neoplasms of gonads	36.4	501
Soft tissue and other extraosseous sarcomas	16.9	233
Malignant bone tumors	13.3	183
Renal tumors	2.1	29
Hepatic tumors	0.9	12
Neuroblastoma and other peripheral nervous cell tumors	0.7	10
Other and unspecified malignant neoplasms	0.7	10
Retinoblastoma	0	0

Rates are per 1,000,000 and age-adjusted to the 2000 US Standard Population.
Source: California Cancer Registry, California Department of Public Health

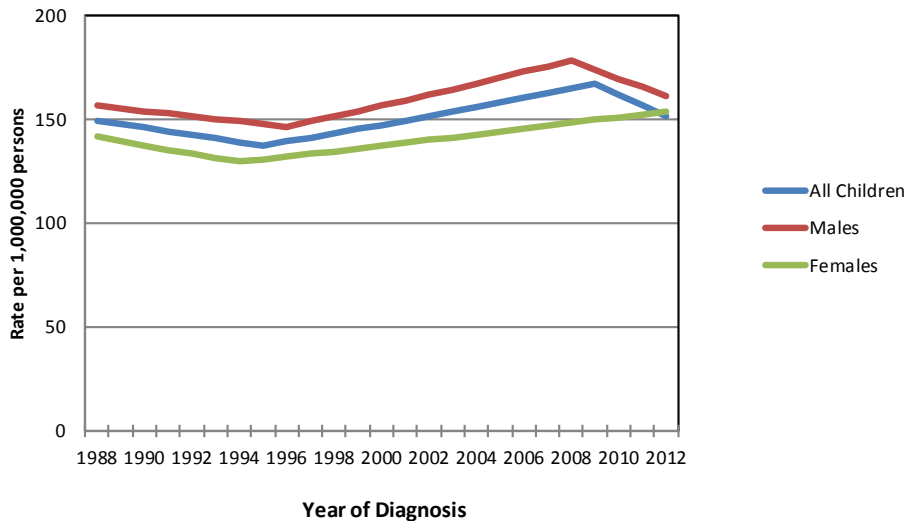
Incidence Trends by Sex, Cancer Type, and Age Group, 1988-2012

Overall, incidence rates for childhood and adolescent cancers have increased since 1988. The cancer incidence trend for all children in California (ages 0-14 years) seemed to decrease from 1988 to 1995 and then increased at a statistically significant rate through 2009 (Figure 5 and Table 10). This pattern was similar for boys but the trend for girls increased at a significant rate from 1994 to 2012. The trend seemed to decrease from 2008 to 2012 for boys and from 2009 to 2012 for all children but the annual percent change (APC) was not significant. Continued monitoring of these trends will indicate whether the decreasing trend observed among boys continues or whether the rates were unusually low in 2012.

Incidence rates for childhood and adolescent cancers have increased since 1988.

Figure 5: Incidence Trends by Sex, Ages 0-14 Years

Age-Adjusted Cancer Incidence Trends Among Children Ages 0-14 years in California by Sex, 1988-2012[§]



[§]Excludes myelodysplastic syndromes and Group III benign brain/CNS tumors.
Source: California Cancer Registry, California Department of Public Health

TABLE 10		
Age-Adjusted Cancer Incidence Trends Among Children Ages 0-14 Years in California by Sex, 1988-2012 [§]		
Sex	Period	APC
All Children	1988-1995	-1.2
	1995-2009	1.4*
	2009-2012	-3.1
Male	1988-1996	-0.8
	1996-2008	1.7*
	2008-2012	-2.5
Female	1988-1994	-1.5
	1994-2012	1.0*

[§]Excludes myelodysplastic syndromes and Group III benign brain/CNS tumors.
*APC is statistically significantly different (p < 0.05). APC=Average Annual Percent Change
Source: California Cancer Registry, California Department of Public Health

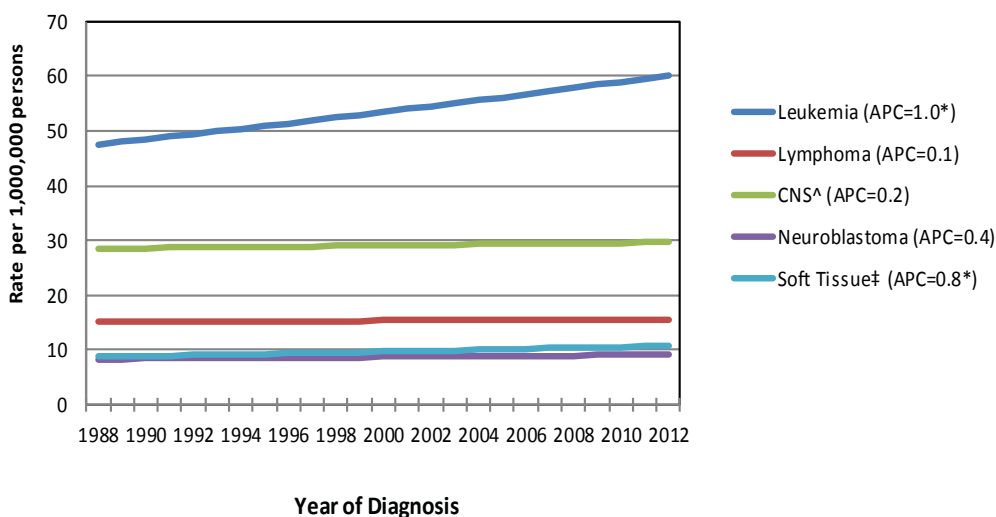
The cancer incidence trends for the most commonly diagnosed cancer types in children show that while incidence rates for lymphomas, CNS and miscellaneous intracranial and intraspinal neoplasms, and neuroblastoma remained relatively stable from 1988-2012, incidence rates for leukemias, the most commonly diagnosed cancer type among children, increased at a statistically significant rate. It is also notable that incidence rates for soft tissue and other extraosseous sarcomas increased at a statistically significant rate during this same period, although overall incidence rates for these cancers are much lower than for leukemias (Figure 6).

From 1988 through 2012, the cancer incidence rates for all adolescents in California (ages 15-19 years) increased slightly, at a statistically significant rate (Figure 7). The incidence rates for male and female adolescents followed a similar pattern.

The cancer incidence trends for the most commonly diagnosed cancer types in adolescents show that incidence rates for leukemias, germ cell tumors, trophoblastic tumors, neoplasms of gonads, and other malignant epithelial neoplasms and melanomas increased at a statistically significant rate from 1988-2012. Incidence rates for lymphomas and central nervous system cancers remained relatively stable among adolescents during this time period (Figure 8).

Figure 6: Incidence Trends by Cancer Type, Ages 0-14 Years

Age-Adjusted Cancer Incidence Trends for the Most Commonly Diagnosed Cancer Types among Children Ages 0-14 years in California, 1988-2012[§]



[§]Excludes myelodysplastic syndromes and Group III benign brain/CNS tumors.
^{*}The annual percent change (APC) is statistically different from zero at $p < 0.05$.
[^]CNS includes miscellaneous intracranial and intraspinal neoplasms.
[‡]Soft tissue includes other extraosseous sarcomas.
 Source: California Cancer Registry, California Department of Public Health

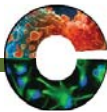
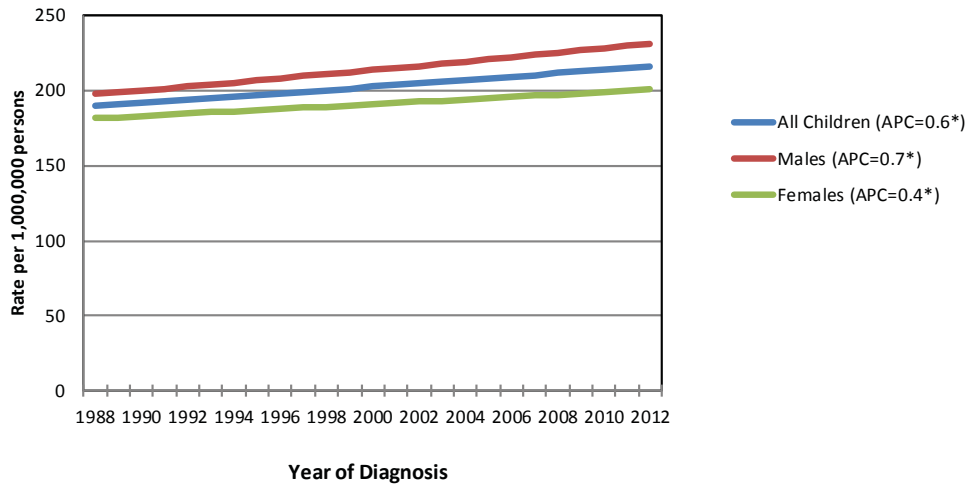


Figure 7: Incidence Trends by Sex, Ages 15-19 Years

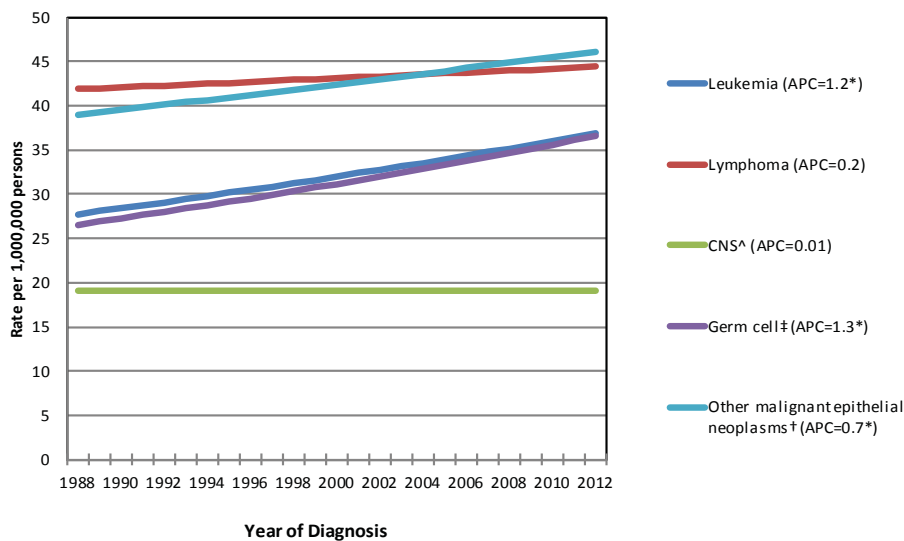
Age-Adjusted Cancer Incidence Trends Among Adolescents Ages 15-19 years in California by Sex, 1988-2012[§]



*§Excludes myelodysplastic syndromes and Group III benign brain/CNS tumors.
*The annual percent change (APC) is statistically different from zero at p<0.05.
Source: California Cancer Registry, California Department of Public Health*

Figure 8: Incidence Trends by Cancer Types, Ages 15-19 Years

Age-Adjusted Cancer Incidence Trends for the Most Commonly Diagnosed Cancer Types among Adolescents Ages 15-19 years in California, 1988-2012[§]



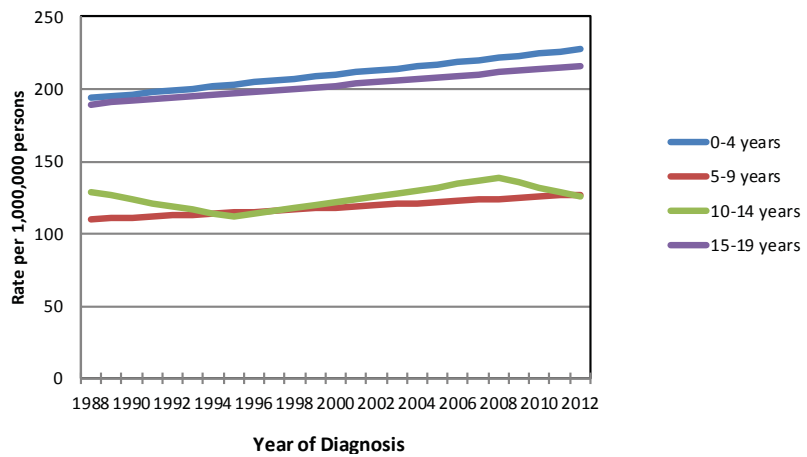
*§Excludes myelodysplastic syndromes and Group III benign brain/CNS tumors.
*The annual percent change (APC) is statistically different from zero at p<0.05.
^CNS includes miscellaneous intracranial and intraspinal neoplasms.
‡Germ cell includes trophoblastic tumors and neoplasms of gonads.
†Includes melanomas.
Source: California Cancer Registry, California Department of Public Health*



Figure 9 and Table 11 show the cancer incidence trends for children and adolescents in California, separated into 5-year age groups (ages 0-4, 5-9, 10-14 and 15-19 years). Children ages 0-4 years, 5-9 years and adolescents ages 15-19 years experienced slight, but statistically significant increases in incidence rates throughout the time period of 1988 to 2012. Incidence rates among children ages 10-14 years decreased at a statistically significant rate from 1988 until 1995 and then increased at a statistically significant rate through 2008. Since 2008, the rate seems to have decreased but is not statistically significant.

Figure 9: Incidence Trends by Age Group 0-19 Years

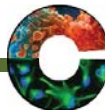
Age-Adjusted Cancer Incidence Trends Among Children and Adolescents in California by Age Group, 1988-2012[§]



[§]Excludes myelodysplastic syndromes and benign brain/CNS tumors.
Source: California Cancer Registry, California Department of Public Health

TABLE 11		
Age-Adjusted Cancer Incidence Trends Among Children and Adolescents in California by Age Group, 1988-2012 [§]		
Age Group	Period	APC
0-4 Years	1988-2012	0.7*
5-9 Years	1988-2012	0.6*
10-14 Years	1988-1995	-2.1*
	1995-2008	1.7*
	2008-2012	-2.5
15-19 Years	1988-2012	0.6*

[§]Excludes myelodysplastic syndromes and Group III benign brain/CNS tumors.
*APC is statistically significantly different (p < 0.05). APC=Average Annual Percent Change
Source: California Cancer Registry, California Department of Public Health



Five-Year Relative Survival (2004-2008) by ICCC Group

Progress in the treatment of childhood and adolescent cancers has resulted in improved five-year relative survival. The five-year relative survival between 2004 and 2008⁴ for all cancers combined (excluding benign brain/CNS tumors) is 81.7 percent for children and 82.2 percent for adolescents (Table 12). With benign brain/CNS tumors included, the five-year relative survival remains the same for children and adolescents. See Table 12 for the five-year relative survival for each of the major ICCC groups broken down by sex and age group.

Progress in the treatment of childhood and adolescent cancers has resulted in improved five-year relative survival.

TABLE 12						
Five-Year Relative Survival [^] (Percent) by International Classification of Childhood Cancer (ICCC) Groups, Sex, and Age, California, 2004-2008						
Cancer Type	Ages 0-14 Years			Ages 15-19 Years		
	Total	Male	Female	Total	Male	Female
All Cancers Combined (Excluding benign brain/CNS tumors)	81.7	81.7	81.7	82.2	79.6	85.3
All Cancers Combined (Including benign brain/CNS tumors)	81.7	81.7	81.7	82.2	79.6	85.3
Leukemias (including myelodysplastic syndromes)	84.4	84.0	85.0	68.4	69.7	66.5
Lymphomas and Reticuloendothelial Neoplasms	92.9	93.9	91.0	92.6	91.8	93.5
CNS and Misc. Intracranial and Intraspinal Neoplasms (includes benign brain/CNS tumors)	70.5	71.8	68.9	76.3	73.9	79.3
Neuroblastoma and Other Peripheral Nervous Cell Tumors	76.0	74.6	77.6	-	-	-
Retinoblastoma	97.9	95.7	100.0	-	-	-
Renal Tumors	87.3	85.7	88.7	68.3	-	-
Hepatic Tumors	77.9	75.4	82.8	55.4	-	-
Malignant Bone Tumors	70.8	70.4	71.1	63.3	60.4	68.8
Soft Tissue and Other Extrasosseous Sarcomas	70.6	71.3	69.8	68.3	63.6	72.9
Germ Cell & Trophoblastic Tumors & Neoplasms of Gonads	93.3	96.1	90.7	90.8	90.4	92.0
Other Malignant Epithelial Neoplasms and Melanomas	91.3	90.0	92.1	91.7	84.3	95.0

[^]Follow-up is through December 2013.
 - Statistics could not be calculated due to fewer than 25 cases during the time period.
 Source: California Cancer Registry, California Department of Public Health

For additional cancer data from the California Cancer Registry (CCR), please refer to our website at www.ccrca.org.

4. Five-year relative survival rates were calculated using data collected over the most recent 10-year period.



TECHNICAL NOTES

- **Incidence (New Cases)**

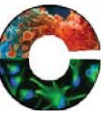
This report includes cases of cancer diagnosed between January 1, 1988, and December 31, 2013, and reported to the California Cancer Registry (CCR) as of November 2015. A “case” is defined as a primary cancer; tumors that result from the spread, or metastasis, of cancer to another organ from a primary cancer are not counted as new cases. Only invasive cancers (those that have infiltrated the tissue of the organ of origin) are included in this report except where noted. Regional registries covering the entire state report cancer incidence data to the CCR, Chronic Disease Surveillance and Research Branch of the California Department of Public Health (CDPH). Standards for data abstracting, collection, and reporting are specified by the CCR. Only cases diagnosed in California residents are included in this report; persons who were treated for cancer in California but who were residents of another state or country are not included.

- **Mortality (Deaths)**

Computerized files containing information on cancer-related deaths were obtained from the CDPH, Center for Health Statistics. Beginning in 1999, cause of death was coded by the International Classification of Diseases, Tenth Edition (ICD-10). All mortality analyses presented in this report are the responsibility of the authors and were not reviewed or endorsed by the Center for Health Statistics prior to publication. Only deaths among California residents were included in these analyses.

- **Statistical Methods**

Calculation of Age-Adjusted Rates: Rates for adults were calculated as the number of new cases (incidence) or deaths (mortality) in specific age groups per 100,000 persons each year and were age-adjusted to the 2000 United States standard population. Incidence rates for children and adolescents were calculated as the number of new cases (incidence) in specific age groups per 1,000,000 persons each year and were age-adjusted to the 2000 United States standard population. Age-adjusted rates are weighted averages of age-specific rates, where the weights represent the age distribution of a standard population. Such adjustment eliminates differences in rates due to changes in the age of a population over time or differences in the age distribution between population groups. Rates in this report were calculated using the Surveillance Research Program, National Cancer Institute SEER*Stat software version 8.1.1 or higher (<http://srab.cancer.gov/seerstat>).



Annual Percent Change (APC): The estimated APC represents the average percent increase or decrease in cancer rates per year over a specified period of time. It is calculated by first fitting a linear regression to the natural logarithm of the annual age-adjusted rates (r), using calendar year as the predictor variable:

$$\ln(r) = m(\text{year}) + b$$

From the slope of the regression line, the APC is calculated as

$$\text{APC} = 100*(e^m - 1)$$

Testing the hypothesis that the APC is equal to zero is equivalent to testing the hypothesis that the slope of the line in the regression is equal to zero. Statistical significance was set at $\alpha = 0.05$.

Joinpoint Analysis of Trends: Joinpoint linear regression was used to determine trends in cancer incidence and mortality. In this analysis, a statistical algorithm detects joinpoints, or points in time where the slope of the regression line significantly changes. Thus, the model describes trends during different time segments. At each segment, trends in rates are measured using the estimated APC, which assumes that rates change by a constant percentage each year. The SEER JoinPoint regression software version 4.1.1 or higher (<http://srab.cancer.gov/joinpoint>) was used for all trend analyses in this report.

Average Annual Percent Change (AAPC): The Average Annual Percent Change (AAPC) is a summary measure of a trend over a pre-specified fixed interval. It allows us to use a single number to describe the average APCs (Annual Percent Changes) over a period of multiple years. It is valid even if the joinpoint model indicates that there were changes in trends during those years. It is computed as a weighted average of the APC(s) from the joinpoint model, with the weights equal to the length of the APC interval.

TECHNICAL NOTES



Physical Address:

1631 Alhambra Boulevard, Suite 200
Sacramento, CA 95816
(916) 731-2500

Mailing Address:

California Cancer Registry

*California Cancer Reporting
and Epidemiologic Surveillance
(Ca/CARES) Program*

*c/o Institute for Population Health Improvement
MS 7205*

P.O. Box 997377

Sacramento, CA 95849-7377

.....
*For additional cancer data from the
California Cancer Registry (CCR),
please refer to our website at
<http://www.cdph.ca.gov>, or
<http://www.ccrca.org>*

UC DAVIS
INSTITUTE FOR POPULATION
HEALTH IMPROVEMENT

