Cancer in California, 1988-2015

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.ccrcal.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:

Killion JA, Giddings BM, Chen Y, Maguire FB, Morris CR, Parikh-Patel A, Kizer KW, Kwong SL, Damesyn M. Cancer in California, 1988-2015. Sacramento, CA: California Department of Public Health, Chronic Disease Surveillance and Research Branch, April 2018.

This and other California Cancer Registry and CalCARES publications are available at:
http://www.cdph.ca.gov
http://www.ccrcal.org
and
http://www.ucdmc.ucdavis.edu/iphi

Prepared By:

Jordan A. Killion, M.P.H., C.P.H.
CalCARES Program
Institute for Population Health Improvement
UC Davis Health

Brenda M. Giddings, M.A.
CalCARES Program
Institute for Population Health Improvement
UC Davis Health

Yi Chen
CalCARES Program
Institute for Population Health Improvement
UC Davis Health

Frances Belda Maguire, M.P.H.
CalCARES Program
Institute for Population Health Improvement
UC Davis Health

Cyllene R. Morris, D.V.M., Ph.D.
Research Program Director
CalCARES Program
Institute for Population Health Improvement
UC Davis Health

Arti Parikh-Patel, Ph.D., M.P.H.
Program Director
CalCARES Program
Institute for Population Health Improvement
UC Davis Health

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

Sandy L. Kwong, M.P.H.
Chronic Disease Surveillance and Research Branch
California Department of Public Health

Mark Damesyn, Dr.PH., 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 and 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 5NU58DP006344; the National Cancer Institute's Surveillance, Epidemiology and End Results Program under contract HHSN261201800032I awarded to the University of California, San Francisco, contract HHSN261201800015I awarded to the University of Southern California, and contract HHSN261201800009I 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.ccrcal.org

Table of Contents

Overview

In 2015, there were 161,392 new cases of cancer diagnosed in California. This corresponds to an age-adjusted cancer incidence (new cases) rate of 384.0 cases per 100,000 people. The age-adjusted cancer incidence rate in California has decreased significantly by 14.8 percent, from 450.8 per 100,000 people, since statewide cancer reporting began in 1988.

From 1988 to 2015, the age-adjusted cancer incidence rate among California females decreased significantly by 9.5 percent, from 414.5 cases per 100,000 females in 1988 to 375.3 per 100,000 females in 2015. Interpreting the trend in the age-adjusted cancer incidence rate among males is complicated by changes in prostate cancer screening procedures that occurred in the late 1980s. The age-adjusted cancer incidence rate among California males increased from 519.5 cases per 100,000 males in 1988 to 601.9 cases per 100,000 males in 1992. This increase was partly due to the establishment and widespread use of the prostate specific antigen (PSA) test which increased the number of prostate cancers detected. After 1992, the cancer incidence rate among males declined, and the rate in 2015 was 402.1 cases per 100,000. Overall, between 1988 and 2015, the age-adjusted cancer incidence rate among California males decreased significantly by 22.6 percent.

In 2015, a total of 59,260 deaths among Californians were due to cancer. Despite cancer having a large number of deaths, the age-adjusted cancer mortality (death) rate has decreased significantly by 30.8 percent, from 205.4 per 100,000 people in 1988 to 142.1 per 100,000 people in 2015. The age-adjusted cancer mortality rate has declined significantly among both males and females by 34.9 percent and 28.6 percent, respectively.

The risk of being diagnosed with or dying from cancer varies by race/ethnicity, although differences are not always statistically significant. In 2015, non-Hispanic white persons had the highest age-adjusted cancer incidence rate of 430.2 per 100,000, followed by American Indians (404.1 per 100,000), African Americans (396.9 per 100,000), Hispanics (309.9 per 100,000), and Asian/Pacific Islanders (286.6 per 100,000). American Indians were not significantly different from non-Hispanic whites or African Americans. Non-Hispanic whites, African Americans, Hispanics and Asian/Pacific Islander incidence rates were all statistically significantly different from one another. African Americans had the highest overall age-adjusted cancer mortality rate of 186.5 per 100,000 persons, followed by

American Indians (168.9 per 100,000), non-Hispanic whites (152.5 per 100,000), Hispanics (121.3 per 100,000), and Asian/Pacific Islanders (109.3 per 100,000). American Indians were not significantly different from non-Hispanic whites or African Americans. Non-Hispanic whites, African Americans, Hispanics and Asian/Pacific Islander mortality rates were all statistically significantly different.

When race/ethnicity was further analyzed by sex, African American males had the highest age-adjusted cancer mortality rate of 221.3 per 100,000, followed by American Indian males (199.6 per 100,000), non-Hispanic white males (178.1 per 100,000), Hispanic males (145.7 per 100,000), and Asian/Pacific Islander males (130.2 per 100,000). Non-Hispanic whites, African Americans, Hispanics and Asian/Pacific Islander mortality rates for males were all statistically significantly different; however, American Indians were not significantly different from non-Hispanic whites or African Americans. For females, African American females had the highest age-adjusted cancer mortality rate of 164.6 per 100,000, followed by American Indian females (145.7 per 100,000), non-Hispanic white females (133.4 per 100,000), Hispanic females (104.5 per 100,000), and Asian/Pacific Islander females (94.4 per 100,000). American Indians were not significantly different from non-Hispanic whites or African Americans. Non-Hispanic whites, African Americans, Hispanics and Asian/Pacific Islander mortality rates for females significantly differed.

For more detailed information on annual statistical tables for California by site, please see: http://www.ccrcal.org/Reports_and_Factsheets/Annual_Statistical Tables_by_Site.shtml. For a mapping tool to display age-adjusted incidence and mortality rates for the last five years by county, site, sex, and race/ethnicity, please see: https://www.cancer-rates.info/ca/.

Leading Cancer Sites by Sex

Tables 1 through 4 (pages 16-17) present incidence, prevalence, and mortality of the ten most common types of cancer among California males and females in 2015. These cancers accounted for 78.1 percent of all new cancer diagnoses and 74.7 percent of all cancer-related deaths. For males, prostate cancer remained the most commonly diagnosed cancer, accounting for 22.0 percent (17,159 cases) of all newly diagnosed cancers among males and the second leading cause of cancer-related death, accounting for 10.8 percent (3,314 deaths) of all cancer-related deaths among males. Prostate cancer was also the most common prevalent cancer among males, which is

represented by the existing cases count. For females, breast cancer remained the most commonly diagnosed cancer, accounting for 31.8 percent (26,514 cases) of all newly diagnosed cancers among females and the second leading cause of cancer-related death, accounting for 15.6 percent (4,441 deaths) of all cancer-related deaths among females. Additionally, breast cancer was the most common (prevalent) cancer among females in California.

The second most commonly diagnosed cancer among both males and females was cancer of the lung and bronchus, which accounted for 10.6 percent (8,248 cases) of newly diagnosed cancers among males and 10.1 percent (8,397 cases) of newly diagnosed cancers among females. Lung and bronchus cancer was the leading cause of cancer-related death among both males and females and accounted for 21.1 percent (6,478 deaths) of all cancer-related deaths among males and 20.5 percent (5,829 deaths) of all cancer-related deaths among females. Colon and rectum cancer was the third most commonly diagnosed cancer and the third leading cause of cancer-related death among both males and females. Among males, colon and rectum cancer accounted for 9.7 percent (7,518 cases) of newly diagnosed cancers and 9.1 percent (2,791 deaths) of cancer-related deaths. Among females, colon and rectum cancer accounted for 8.3 percent (6,901 cases) of newly diagnosed cancers and 9.2 percent (2,628 deaths) of cancer related–deaths.

Leading Cancer Sites by Sex and Race/Ethnicity

The ten most commonly diagnosed cancers in California from 2011 to 2015 among males and females in 15 racial/ethnic groups are displayed in tables 5 and 6 (pages 18-19). The race/ethnicity categories examined are: African American, American Indian, 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 among males in most racial/ethnic groups, with lung and bronchus cancer and colon and rectum cancer ranking second and third. Exceptions to this were Kampuchean males for whom liver and intrahepatic bile duct (IBD) cancer was the most commonly diagnosed cancer, followed by colon and rectum cancer and lung and bronchus cancer. Colon and rectum cancer was the most commonly diagnosed cancer among Korean males, followed by lung and bronchus cancer and prostate cancer. Laotian and Hmong males were most commonly diagnosed with liver and IBD cancer, with lung and bronchus cancer being the second most diagnosed, and colon and rectum

cancer being third. Lastly, Vietnamese males were most commonly diagnosed with lung and bronchus cancer, followed by liver and IBD cancer, and third colon and rectum cancer. For Thai males, liver and IBD cancer was the third most commonly diagnosed cancer.

For females in all of the 15 racial/ethnic groups, breast cancer was the most commonly diagnosed cancer. Colon and rectum cancer and lung and bronchus cancer were the second and third most commonly diagnosed cancers among females in most of the racial/ethnic groups. Exceptions were Filipino, Hawaiian, and Pacific Islander females for whom uterine cancer was the second most commonly diagnosed cancer and Hispanic females for whom uterine cancer was the third most commonly diagnosed cancer. Additionally, thyroid cancer was the second most commonly diagnosed cancer among South Asian females followed by uterine cancer. Among Korean females, thyroid cancer was the third most commonly diagnosed cancer.

Cancer Incidence and Mortality Trends (2005-2014)

Figures 1 and 2 (pages 20-21) depict the trends in cancer incidence and mortality rates for the most common cancers, by sex, over the most recent ten-year period (2005-2014). Looking at cancer trends over the most recent time period allows for any new or emerging trends to become evident. A bar to the right of zero (i.e., a positive percentage) means that, on average, the rate increased and a bar to the left of zero (i.e., a negative percentage) means that the rate decreased, on average. 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 2005 to 2014. While all of the reasons for these declines are not known, some of the declines can be attributed to lower rates of smoking and the consequent decline of smoking-related cancers (e.g., cancers of the lung and bronchus, larynx, stomach, cervix uteri, and urinary bladder).

For males, when all cancers were examined together, there was a statistically significant decrease in incidence and mortality rates over the most recent ten-year period. When cancers were examined separately, the incidence of seven frequently diagnosed cancers decreased significantly including cancers of the prostate, lung and bronchus, larynx, colon and rectum (i.e., colorectal), Hodgkin lymphoma, urinary bladder, and stomach.

Additionally, mortality from five of these seven cancers also decreased significantly, the exceptions being Hodgkin lymphoma and urinary bladder cancer. The incidence of seven cancers increased significantly among males over the most recent ten-year period including cancers of the oral cavity, testis, kidney, myeloma, melanoma of the skin, liver and IBD, and thyroid. Mortality from all but two of these cancers did not change significantly. Only mortality from liver and IBD cancer increased significantly among males during the time period, and mortality from myeloma decreased significantly.

Although the incidence of non-Hodgkin lymphoma, esophageal cancer, cancer of the soft tissue, and leukemia did not change significantly for males during the most recent ten-year period, mortality from these cancers did change significantly. Mortality from non-Hodgkin lymphoma, esophageal cancer, and leukemia decreased significantly and mortality from cancer of the soft tissue increased significantly.

For females, when all cancers were examined together, incidence did not significantly change and mortality decreased significantly during the most recent ten-year period. When cancers were examined separately, the incidence of seven frequently diagnosed cancers among females decreased significantly including colorectal, lung and bronchus, Hodgkin lymphoma, urinary bladder, cervix uteri, ovary, and oral cavity. Mortality also decreased significantly for five of these cancers, the exceptions being Hodgkin lymphoma and cervical cancer.

The incidence of five frequently diagnosed cancers among females increased significantly over the most recent ten-year period including cancers of the kidney, soft tissue, uterus, liver and IBD, and thyroid. Mortality from uterine cancer and liver and IBD cancer also increased significantly. Mortality for kidney, soft tissue, and thyroid cancer did not significantly change.

Although the incidence of brain cancer, non-Hodgkin lymphoma, myeloma, melanoma of the skin, leukemia, stomach, breast, and pancreas did not change significantly for females during the most recent ten-year period, mortality for some of these cancers did change significantly. Mortality from non-Hodgkin lymphoma, leukemia, stomach, and breast cancer decreased significantly.

Five-Year Relative Survival by Stage at Diagnosis (2006-2015)

Cancer survival is usually expressed as a rate or percentage of all 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 first five years following diagnosis, after adjusting 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 the cancer has spread at the time of diagnosis. The following terms are used to describe the different stages of diagnosis used in this report:

Localized: The tumor broke through the first layer of cells (the basement membrane), but is still confined to the organ in which it originated.

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 (page 22) presents data on five-year relative survival by stage at diagnosis for the most common types of cancer incidence and mortality for Californians diagnosed between 2006 and 2015. 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 Screening in California

Screening means checking for a disease before it has caused symptoms. Screening tests may find diseases at an early stage when there is a better chance of curing or materially slowing the progress of the disease, although this is not always the case. Examples of cancer screening tests are the mammogram for breast cancer, the Pap smear for cervical cancer, and the prostate-specific antigen (PSA) blood test for prostate cancer. Screening for colorectal cancers can be done with a fecal occult blood test, colonoscopy, or sigmoidoscopy. Screening can also include assessing a person's risk of developing an inherited disease by doing genetic tests. For some cancers, screening not only detects tumors at an early stage, but may also prevent cancers from developing by removing pre-cancerous lesions. Most cancers of the cervix, colon, and rectum can be prevented by regular screening.

The four cancers where screening is commonly used are colorectal cancer in both sexes, prostate cancer for males, and breast and cervical cancer for females. Cancer diagnosed at an early stage, including *in situ* and localized stages, can be an indication of screening use and early detection. Tables 8 and 9 (pages 23-24) examine the percent of these cancers that were diagnosed at an early stage for all of California, and separately for the 15 most populous counties, which account for approximately 80 percent of the population in California.

For Californian males from 2011 to 2015, colorectal cancer was diagnosed at an early stage for 39.8 percent of cases, and prostate cancer was diagnosed at an early stage for 71.8 percent of cases. For females in California from 2011 to 2015, colorectal cancer was diagnosed at an early stage for 39.7 percent of cases, breast cancer was diagnosed at an early stage for 64.1 percent of cases, and cervical cancer was diagnosed at an early stage for 43.4 percent of cases.

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

Each year from 2011 to 2015, approximately 1,800 children and adolescents were diagnosed with cancer in California. These cases represent slightly more than one percent of all new cancer cases diagnosed among California residents during this time period. Although childhood and adolescent cancer incidence rates have increased since 1988, progress in treatment has resulted in improved five-year relative survival. Overall, children and adolescents diagnosed with cancer in California between 2006 and 2015 had a five-year relative survival of 82.2 percent and 82.8 percent, respectively.

Incidence Rates and Number of Cases by International Classification of Childhood Cancer (ICCC) Group (2011-2015)

Childhood and adolescent cancers are classified differently than adult cancers; they are categorized according to the ICCC (additional information about the ICCC may be obtained from: http://seer.cancer.gov/iccc/). The classification of childhood and adolescent cancers is based on the form and structure of the tumor (more commonly referred to as the tumor morphology) and the primary site (e.g., lung, colon, etc.), with an emphasis on morphology. Adult cancers are also categorized based on morphology and

primary site, but the emphasis is on primary site. The ICCC is broken down into the following twelve site groups:

I. Leukemias, myeloproliferative diseases, and myelodysplastic diseases
II. Lymphomas and reticuloendothelial neoplasms
III. Central nervous system (CNS) 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

Between 2011 and 2015, leukemia was the most commonly diagnosed cancer among California children (ages 0-14 years) and accounted for 34 percent of all cancers diagnosed in this age group (Figure 3, page 25). CNS tumors were the second most commonly diagnosed cancer and accounted for 24 percent of all childhood cancers. For additional information on childhood cancer incidence rates and case counts, see Table 10 (page 25).

For adolescents (ages 15-19 years), the most commonly diagnosed cancers between 2011 and 2015 were CNS tumors which accounted for 20 percent of all adolescent cancers (Figure 4, page 26). Other malignant epithelial neoplasms and malignant melanomas were the second most frequently diagnosed cancers among adolescents and accounted for 19 percent of all cancers diagnosed in this age group. For additional data regarding adolescent cancer incidence rates and case counts, see Table 11 (page 26).

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.

Childhood Cancer Incidence Trends by Sex and Cancer Type (2005-2014)

Overall, the age-adjusted incidence rate of childhood cancer (ages 0 to 14 years) slightly increased from 159.7 per 1,000,000 in 2005 to 165.1 per 1,000,000 in 2014 (Figure 5, page 27). The trends in the age-adjusted

incidence rate were similar when examined by sex. For males and females, there was a slight increase in the age-adjusted incidence rates from 2005 to 2014 but these changes were not statistically significant.

Incidence trends for the most commonly diagnosed types of childhood cancer are presented in Figure 6 (page 27). The incidence rates of leukemia, lymphoma, CNS tumors, neuroblastoma, and cancer of the soft tissue did not change significantly during this time period.

Adolescent Incidence Trends by Sex and Cancer Type (2005-2014)

From 2005 to 2014, the age-adjusted cancer incidence rate for adolescents (ages 15-19 years) increased significantly by 1.2 percent per year (Figure 7, page 28). The age-adjusted cancer incidence rate for male adolescents was higher than that of female adolescents and the trend in the age-adjusted incidence rate among males increased significantly. The trend in the age-adjusted cancer incidence rate among female adolescents also appeared to increase non-significantly during the time period.

Incidence trends for the most commonly diagnosed types of adolescent cancer are presented in Figure 8 (page 28). From 2005 to 2014, the incidence of lymphoma, leukemia, germ cell tumors, other malignant epithelial neoplasms (including melanoma), and CNS tumors all slightly increased but these increases were not statistically significant.

Childhood and Adolescent Incidence Trends by Age Group (2005-2014)

Figure 9 (page 29) and Table 12 (page 29) display the cancer incidence trends for children and adolescents, separated into five-year age groups (ages 0-4, 5-9, 10-14, and 15-19 years). From 2005 to 2014, cancer incidence among children ages 0-4 years, 5-9 years, and 15-19 years did not change significantly. For children ages 10-14 years, cancer incidence appeared to decrease from 2005 to 2012 and then significantly increased by 10.2 percent per year from 2012 to 2014.

Five-Year Relative Survival by ICCC Group (2006-2015)

There has been improvement in the five-year relative survival rates for childhood and adolescent cancers, in part due to progress in cancer

treatments. The five-year relative survival in California, from 2006 to 2015, for all cancers combined (excluding benign brain/CNS tumors) was 82.2 percent for children and 82.8 percent for adolescents (Table 13, page 30). When benign brain/CNS tumors were included, the five-year relative survival was the same for children and 0.6 percent lower for adolescents. See Table 13 (page 30) for the five-year relative survival for each of the major ICCC groups by sex and age group.

Tables and Graphs

Table 1: Most Common Types of Cancer Incidence and Prevalence among California Males, 2015

Rank	Cancer Type	New Cases	Incidence Rate	Existing Cases
1	Prostate	17,159	84.4	271,895
2	Lung and Bronchus	8,248	44.7	18,847
3	Colon and Rectum	7,518	38.9	62,210
4	Melanoma of the Skin	5,586	29.2	51,709
5	Urinary Bladder	5,049	27.7	43,479
6	Non-Hodgkin Lymphoma	4,034	21.2	32,405
7	Kidney and Renal Pelvis	3,896	19.8	26,911
8	Oral Cavity and Pharynx	3,010	14.9	22,053
9	Leukemia	2,721	14.5	20,428
10	Liver and Intrahepatic Bile Duct	2,944	14.1	6,847

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

Table 2: Most Common Types of Cancer Mortality among California Males, 2015

Rank	Cancer Site	Count	Rate
1	Lung and Bronchus	6,478	35.5
2	Prostate	3,314	19.4
3	Colon and Rectum	2,791	15
4	Pancreas	2,163	11.6
5	Liver and Intrahepatic Bile Duct	2,207	11.1
6	Leukemia	1,380	7.8
7	Non-Hodgkin Lymphoma	1,214	6.7
8	Urinary Bladder	1,155	6.6
9	Esophagus	1,058	5.5
10	Brain and Other Nervous System	1,017	5.3

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

Table 3: Most Common Types of Cancer Incidence and Prevalence among California Females, 2015				
Rank	Cancer Type	New Cases	Incidence Rate	Existing Cases
1	Breast	26,514	119.8	321,370
2	Lung and Bronchus	8,397	36.9	25,534
3	Colon and Rectum	6,901	30.6	61,634
4	Corpus and Uterus, NOS	5,855	25.5	61,154
5	Thyroid	3,951	19.2	49,083
6	Melanoma of the Skin	3,750	17	45,236
7	Non-Hodgkin Lymphoma	3,295	14.7	29,169
8	Ovary	2,530	11.5	19,981
9	Pancreas	2,382	10.4	3,388
10	Kidney and Renal Pelvis	2,235	10.1	17,286
Rates are per 100,000 and age-adjusted to the 2000 U.S. Standard Population. *Source: California Cancer Registry, California Department of Public Health*				

Table 4: Most Common Types of Cancer Mortality among California Females, 2015			
Rank	**Cancer Site**	**Count**	**Rate**
1	Lung and Bronchus	5,829	25.3
2	Breast	4,441	19.4
3	Colon and Rectum	2,628	11.3
4	Pancreas	2,061	8.9
5	Ovary	1,582	6.9
6	Liver and Intrahepatic Bile Duct	1,135	4.9
7	Corpus and Uterus, NOS	1,123	4.8
8	Leukemia	958	4.3
9	Non-Hodgkin Lymphoma	943	4.1
10	Brain and Other Nervous System	793	3.5
Rates are per 100,000 and age-adjusted to the 2000 U.S. Standard Population. *Source: California Cancer Registry, California Department of Public Health*			

Table 5: Ten Most Commonly Diagnosed Types of Cancer by Race/Ethnicity among California Males, 2011-2015

Rank	1	2	3	4	5	6	7	8	9	10
African American	Prostate (8,250)	Lung and Bronchus (3,047)	Colon and Rectum (2,465)	Kidney and Renal Pelvis (1,238)	Liver and IBD[x] (1,003)	Urinary Bladder (958)	Non-Hodgkin Lymphoma (903)	Pancreas (760)	Myeloma (743)	Leukemia (680)
American Indian	Prostate (379)	Lung and Bronchus (239)	Colon and Rectum (201)	Liver and IBD[x] (155)	Kidney and Renal Pelvis (128)	Non-Hodgkin Lymphoma (103)	Urinary Bladder (98)	Oral Cavity and Pharynx (86)	Pancreas (71)	Melanoma of the Skin (58)
Chinese	Prostate (1,946)	Lung and Bronchus (1,733)	Colon and Rectum (1,550)	Liver and IBD[x] (753)	Non-Hodgkin Lymphoma (601)	Urinary Bladder (545)	Stomach (488)	Oral Cavity and Pharynx (461)	Kidney and Renal Pelvis (410)	Pancreas (399)
Filipino	Prostate (2,137)	Lung and Bronchus (1,464)	Colon and Rectum (1,134)	Non-Hodgkin Lymphoma (515)	Liver and IBD[x] (489)	Kidney and Renal Pelvis (455)	Urinary Bladder (302)	Leukemia (288)	Pancreas (274)	Thyroid (274)
Hawaiian	Prostate (113)	Lung and Bronchus (69)	Colon and Rectum (66)	Oral Cavity and Pharynx (24)	Non-Hodgkin Lymphoma (24)	Liver and IBD[x] (21)	Pancreas (20)	Kidney and Renal Pelvis (20)	Urinary Bladder (18)	Thyroid (17)
Hispanic	Prostate (16,701)	Colon and Rectum (7,851)	Lung and Bronchus (4,910)	Kidney and Renal Pelvis (4,556)	Non-Hodgkin Lymphoma (4,143)	Liver and IBD[x] (4,117)	Leukemia (3,179)	Urinary Bladder (2,763)	Stomach (2,483)	Testis (2,277)
Japanese	Prostate (658)	Colon and Rectum (466)	Lung and Bronchus (382)	Urinary Bladder (211)	Non-Hodgkin Lymphoma (207)	Stomach (192)	Pancreas (133)	Kidney and Renal Pelvis (130)	Liver and IBD[x] (91)	Oral Cavity and Pharynx (89)
Kampuchean	Liver and IBD[x] (81)	Colon and Rectum (71)	Lung and Bronchus (68)	Prostate (29)	Oral Cavity and Pharynx (23)	Non-Hodgkin Lymphoma (20)	Pancreas (16)	Kidney and Renal Pelvis (15)	Leukemia (15)	Urinary Bladder (11)
Korean	Colon and Rectum (516)	Lung and Bronchus (503)	Prostate (433)	Stomach (368)	Liver and IBD[x] (281)	Urinary Bladder (214)	Pancreas (147)	Kidney and Renal Pelvis (140)	Non-Hodgkin Lymphoma (129)	Thyroid (103)
Laotian/ Hmong	Liver and IBD[x] (86)	Lung and Bronchus (86)	Colon and Rectum (70)	Oral Cavity and Pharynx (31)	Non-Hodgkin Lymphoma (29)	Stomach (28)	Prostate (23)	Leukemia (23)	Pancreas (22)	Brain and Other Nervous System (12)
Pacific Islander^	Prostate (210)	Lung and Bronchus (112)	Colon and Rectum (93)	Liver and IBD[x] (54)	Kidney and Renal Pelvis (41)	Oral Cavity and Pharynx (39)	Urinary Bladder (36)	Non-Hodgkin Lymphoma (34)	Stomach (31)	Leukemia (30)
South Asian†	Prostate (729)	Colon and Rectum (308)	Lung and Bronchus (243)	Non-Hodgkin Lymphoma (228)	Urinary Bladder (204)	Leukemia (181)	Oral Cavity and Pharynx (158)	Kidney and Renal Pelvis (131)	Liver and IBD[x] (113)	Thyroid (96)
Thai	Prostate (68)	Colon and Rectum (49)	Liver and IBD[x] (35)	Lung and Bronchus (35)	Non-Hodgkin Lymphoma (21)	Kidney and Renal Pelvis (12)	Oral Cavity and Pharynx (11)	Stomach (11)	Pancreas (11)	Thyroid (10)
Vietnamese	Lung and Bronchus (881)	Liver and IBD[x] (750)	Colon and Rectum (659)	Prostate (607)	Non-Hodgkin Lymphoma (278)	Oral Cavity and Pharynx (206)	Stomach (200)	Kidney and Renal Pelvis (148)	Urinary Bladder (146)	Pancreas (144)
Non-Hispanic White	Prostate (54,616)	Lung and Bronchus (26,521)	Melanoma of the Skin (22,602)	Colon and Rectum (20,390)	Urinary Bladder (18,806)	Non-Hodgkin Lymphoma (12,047)	Kidney and Renal Pelvis (10,099)	Oral Cavity and Pharynx (9,916)	Leukemia (8,400)	Pancreas (7,118)

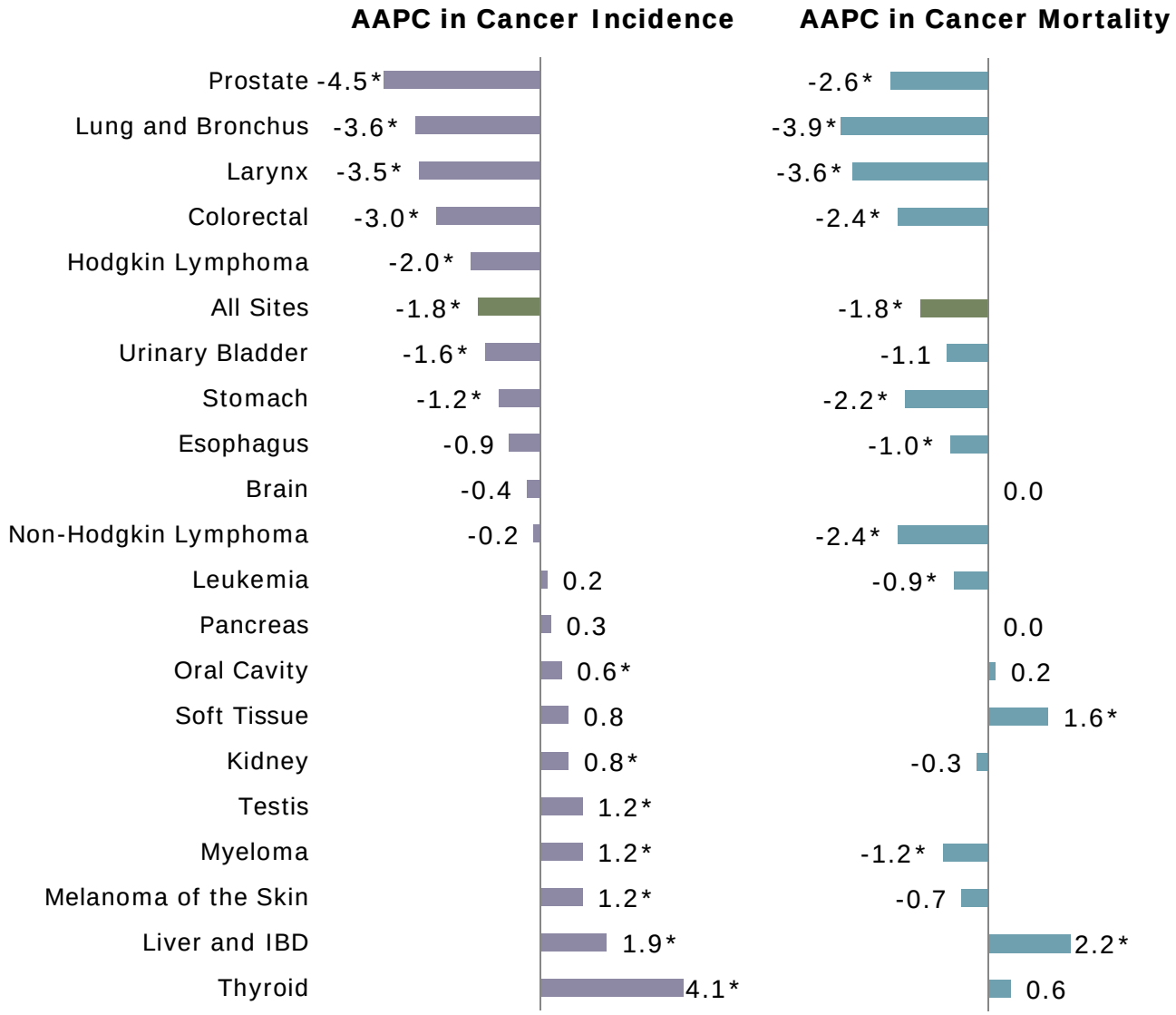
^ Pacific Islander includes: Micronesian, Chamorran, Guamanian, Polynesian, Tahitian, Samoan, Tongan, Melanesian, Fiji Islander, New Guinean, and Pacific Islander not specified
† South Asian Includes: Asian Indian and Pakistani
[x] IBD: Intrahepatic Bile Duct
Source: California Cancer Registry, California Department of Public Health

Table 6: Ten Most Commonly Diagnosed Types of Cancer by Race/Ethnicity among California Females, 2011-2015

Rank	1	2	3	4	5	6	7	8	9	10
African American	Breast (8,265)	Lung and Bronchus (3,037)	Colon and Rectum (2,575)	Uterus (1,738)	Pancreas (846)	Non-Hodgkin Lymphoma (808)	Kidney and Renal Pelvis (788)	Thyroid (744)	Myeloma (637)	Ovary (620)
American Indian	Breast (684)	Lung and Bronchus (254)	Colon and Rectum (221)	Uterus (191)	Thyroid (107)	Kidney and Renal Pelvis (90)	Cervix Uteri (75)	Non-Hodgkin Lymphoma (75)	Liver and IBD[x] (69)	Ovary (66)
Chinese	Breast (4,140)	Lung and Bronchus (1,527)	Colon and Rectum (1,306)	Uterus (770)	Thyroid (723)	Non-Hodgkin Lymphoma (463)	Ovary (405)	Pancreas (389)	Stomach (386)	Liver and IBD[x] (352)
Filipino	Breast (5,332)	Uterus (1,223)	Colon and Rectum (1,106)	Lung and Bronchus (1,054)	Thyroid (1,027)	Non-Hodgkin Lymphoma (511)	Ovary (442)	Pancreas (393)	Cervix Uteri (300)	Leukemia (288)
Hawaiian	Breast (241)	Uterus (76)	Colon and Rectum (63)	Lung and Bronchus (50)	Thyroid (33)	Ovary (27)	Cervix Uteri (18)	Kidney and Renal Pelvis (17)	Non-Hodgkin Lymphoma (17)	Leukemia (17)
Hispanic	Breast (24,472)	Colon and Rectum (6,848)	Uterus (6,143)	Thyroid (5,711)	Lung and Bronchus (4,618)	Non-Hodgkin Lymphoma (3,785)	Kidney and Renal Pelvis (3,134)	Ovary (2,902)	Cervix Uteri (2,597)	Leukemia (2,483)
Japanese	Breast (1,498)	Colon and Rectum (572)	Lung and Bronchus (489)	Uterus (234)	Non-Hodgkin Lymphoma (224)	Pancreas (205)	Stomach (159)	Thyroid (135)	Ovary (110)	Urinary Bladder (105)
Kampuchean	Breast (111)	Colon and Rectum (64)	Lung and Bronchus (54)	Liver and IBD[x] (36)	Thyroid (31)	Uterus (23)	Cervix Uteri (21)	Stomach (16)	Ovary (16)	Oral Cavity and Pharynx (14)
Korean	Breast (1,060)	Colon and Rectum (490)	Thyroid (311)	Lung and Bronchus (298)	Stomach (243)	Pancreas (171)	Uterus (169)	Liver and IBD[x] (139)	Ovary (138)	Non-Hodgkin Lymphoma (118)
Laotian/ Hmong	Breast (93)	Colon and Rectum (79)	Lung and Bronchus (52)	Uterus (33)	Cervix Uteri (29)	Thyroid (29)	Liver and IBD[x] (27)	Oral Cavity and Pharynx (23)	Pancreas (22)	Leukemia (22)
Pacific Islander^	Breast (414)	Uterus (248)	Lung and Bronchus (109)	Colon and Rectum (103)	Thyroid (73)	Cervix Uteri (53)	Ovary (45)	Non-Hodgkin Lymphoma (35)	Stomach (31)	Pancreas (24)
South Asian±	Breast (1,398)	Thyroid (296)	Uterus (270)	Colon and Rectum (188)	Ovary (170)	Non-Hodgkin Lymphoma (156)	Lung and Bronchus (137)	Leukemia (111)	Pancreas (73)	Oral Cavity and Pharynx (69)
Thai	Breast (189)	Lung and Bronchus (55)	Colon and Rectum (52)	Uterus (35)	Thyroid (35)	Non-Hodgkin Lymphoma (19)	Liver and IBD[x] (18)	Ovary (18)	Cervix Uteri (17)	Pancreas (13)
Vietnamese	Breast (1,383)	Colon and Rectum (549)	Lung and Bronchus (548)	Thyroid (309)	Uterus (282)	Liver and IBD[x] (228)	Non-Hodgkin Lymphoma (198)	Ovary (171)	Stomach (156)	Cervix Uteri (130)
Non-Hispanic White	Breast (76,220)	Lung and Bronchus (29,001)	Colon and Rectum (19,423)	Uterus (15,328)	Melanoma of the Skin (14,062)	Non-Hodgkin Lymphoma (9,193)	Thyroid (9,036)	Ovary (6,961)	Pancreas (6,511)	Leukemia (5,756)

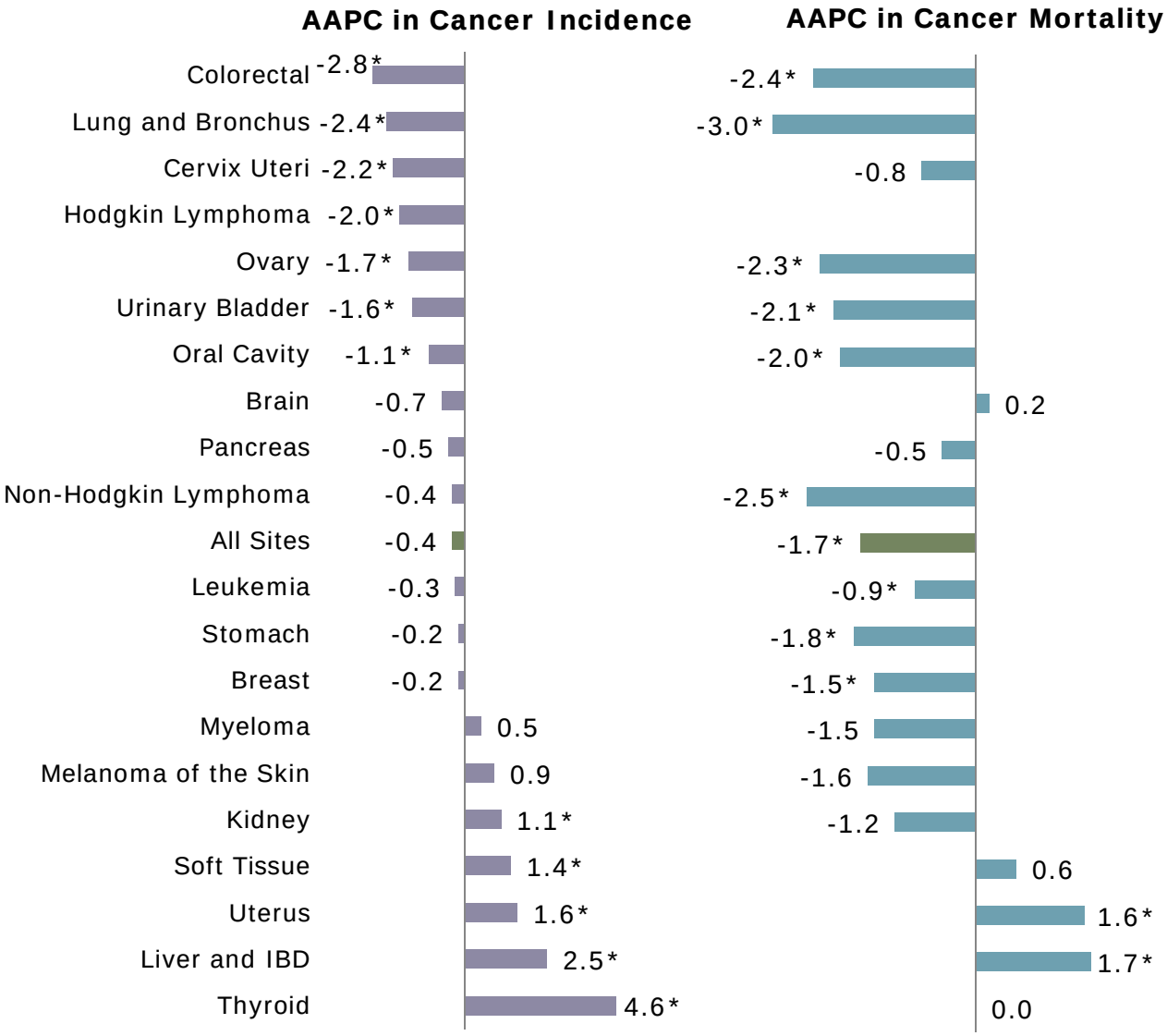
^ Pacific Islander includes: Micronesian, Chamorran, Guamanian, Polynesian, Tahitian, Samoan, Tongan, Melanesian, Fiji Islander, New Guinean, and Pacific Islander not specified
± South Asian Includes: Asian Indian and Pakistani
[x] IBD: Intrahepatic Bile Duct
Source: California Cancer Registry, California Department of Public Health

Figure 1: Average Annual Percent Change (AAPC) in Cancer Incidence and Mortality Trends among California Males, 2005-2014



*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 Hodgkin lymphoma and testicular cancer mortality, the AAPC could not be calculated due to small counts.
Source: California Cancer Registry, California Department of Public Health

Figure 2: Average Annual Percent Change (AAPC) in Cancer Incidence and Mortality Trends among California Females, 2005-2014



*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 Hodgkin lymphoma mortality, the AAPC could not be calculated due to small counts.
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," which is available on the UC Davis Institute for Population Health Improvement website: http://www.ucdmc.ucdavis.edu/iphi/Programs/CCR/index.html.

Table 7: Five-Year Relative Survival (Percentage) by Stage at Diagnosis, California, 2006-2015

Cancer Type	All Stages	Localized	Regional	Distant
Breast (Female)	90.5	98.4	85.3	28.4
Brain and Nervous System	33.1	36.1	21.7^	
Cervical	68.1	91.9	57.4	18.1
Colorectal	66.0	90.0	70.6	13.9
Uterus	82.1	95.1	69.0	17.8
Esophagus	18.1	39.7	22.3	4.1
Kidney and Renal Pelvis	73.6	91.4	66.8	11.8
Leukemia	58.0	N/A: All leukemias are staged as distant disease; thus survival cannot be calculated for other stages		58.0
Liver and Intrahepatic Bile Duct	20.6	32.5	11.9	3.0
Lung and Bronchus	18.4	56.7	29.4	4.7
Melanoma	89.6	96.6	61.5	18.6
Non-Hodgkin Lymphoma	69.5	82.2	73.0	61.8
Oral Cavity and Pharynx	66.3	83.4	65.9	39.1
Ovary	49.3	91.2	75.2	30.5
Pancreas	8.4	32.5	11.0	2.7
Prostate	97.6	100.0	100.0	29.6
Stomach	30.8	67.4	31.1	5.1
Testis	94.1	98.6	95.4	70.9
Thyroid	97.3	99.9	97.6	55.8
Urinary Bladder	57.9	69.3	39.0	6.1

*Follow-up is through December, 31 2015. Cancers that were unstaged at time of diagnosis were excluded.
^For brain and other nervous system tumors, regional and distant stages were combined. Localized stage indicates the tumor is only in one hemisphere of the brain, and regional/distant stage indicates the tumor extends beyond one hemisphere.
Source: California Cancer Registry, California Department of Public Health

Table 8: Percent and Number of Cancer Cases Diagnosed at Early* Stage among California Males by County, 2011-2015				
	Colon and Rectum		Prostate	
County	Count	Percent	Count	Percent
California	14,530	39.8%	66,416	71.8%
Alameda	588	41.1%	3,130	79.7%
Contra Costa	467	40.0%	2,744	78.7%
Fresno	305	40.3%	1,271	74.3%
Kern	284	39.6%	1,162	66.9%
Los Angeles	3,610	38.2%	13,856	62.2%
Orange	1,281	44.1%	5,607	74.4%
Riverside	939	42.1%	4,557	78.5%
Sacramento	583	39.8%	2,447	73.6%
San Bernardino	811	40.8%	3,301	72.2%
San Diego	1,121	38.9%	5,465	72.0%
San Francisco	401	43.3%	1,500	77.0%
San Joaquin	282	43.1%	1,140	75.2%
San Mateo	304	42.8%	1,638	78.3%
Santa Clara	682	40.5%	3,608	81.1%
Ventura	297	37.5%	1,408	65.9%

Rates are per 100,000 and age-adjusted to the 2000 U.S. Standard Population.
*Early stage includes *in situ* and localized stages
Source: California Cancer Registry, California Department of Public Health

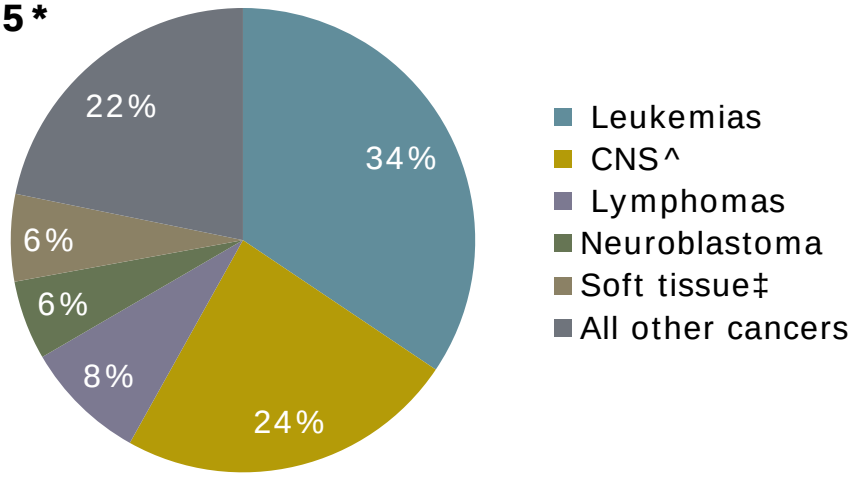
Table 9: Percent and Number of Cancer Cases Diagnosed at Early* Stage among California Females by County, 2011-2015						
	Colon and Rectum		Breast		Cervix Uteri	
County	Count	Percent	Count	Percent	Count	Percent
California	13,585	39.7%	81,889	64.1%	3,088	43.4%
Alameda	557	40.4%	3,541	65.8%	131	49.2%
Contra Costa	490	42.1%	2,858	66.0%	94	48.0%
Fresno	303	42.3%	1,714	65.7%	72	37.9%
Kern	244	42.2%	1,266	61.3%	71	40.6%
Los Angeles	3,415	38.2%	19,465	61.8%	873	42.6%
Orange	1,157	43.3%	7,149	65.4%	219	42.9%
Riverside	794	38.8%	4,421	63.2%	184	40.7%
Sacramento	539	36.2%	3,601	65.8%	130	40.1%
San Bernardino	731	41.9%	3,448	59.8%	189	42.7%
San Diego	1,057	38.6%	6,991	63.3%	230	43.4%
San Francisco	377	42.7%	1,986	67.5%	74	50.0%
San Joaquin	248	39.9%	1,334	62.3%	38	28.8%
San Mateo	305	44.3%	2,205	70.2%	58	50.9%
Santa Clara	622	40.7%	4,020	66.5%	131	54.4%
Ventura	278	38.3%	2,093	66.6%	70	49.3%

Rates are per 100,000 and age-adjusted to the 2000 U.S. Standard Population.

*Early stage includes *in situ* and localized stages

Source: California Cancer Registry, California Department of Public Health

Figure 3: Distribution of Cancer Types among Children Ages 0-14 Years in California, 2011-2015*



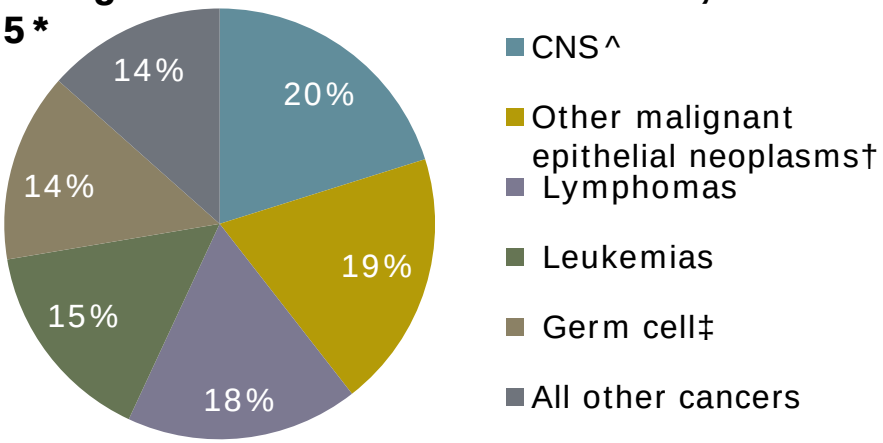
*Includes myelodysplastic syndromes and benign brain/CNS tumors.
^Includes miscellaneous intracranial and intraspinal neoplasms.
‡Includes other extraosseous sarcomas.
Source: California Cancer Registry, California Department of Public Health

Table 10: Childhood Cancer (0-14 years) Average Incidence Rates and Counts in California, 2011-2015 (including myelodysplastic syndromes and benign brain/CNS tumors)

Cancer Type	Rate	Count
All cancers combined (including benign brain/CNS tumors)	175.2	6,676
All cancers combined (excluding benign brain/CNS tumors)	161.0	6,136
Leukemias, myeloproliferative & myelodysplastic diseases	60.0	2,297
CNS and miscellaneous intracranial and intraspinal neoplasms	41.7	1,582
Lymphomas and reticuloendothelial neoplasms	15.1	568
Soft tissue and other extraosseous sarcomas	10.7	405
Neuroblastoma and other peripheral nervous cell tumors	9.5	369
Other malignant epithelial neoplasms and melanomas	9.2	343
Renal tumors	8.0	310
Malignant bone tumors	7.0	264
Germ cell & trophoblastic tumors & neoplasms of gonads	5.8	218
Retinoblastoma	4.6	178
Hepatic tumors	3.2	124
Other and unspecified malignant neoplasms	0.5	18

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

Figure 4: Distribution of Cancer Types among Adolescents Ages 15-19 Years in California, 2011-2015*



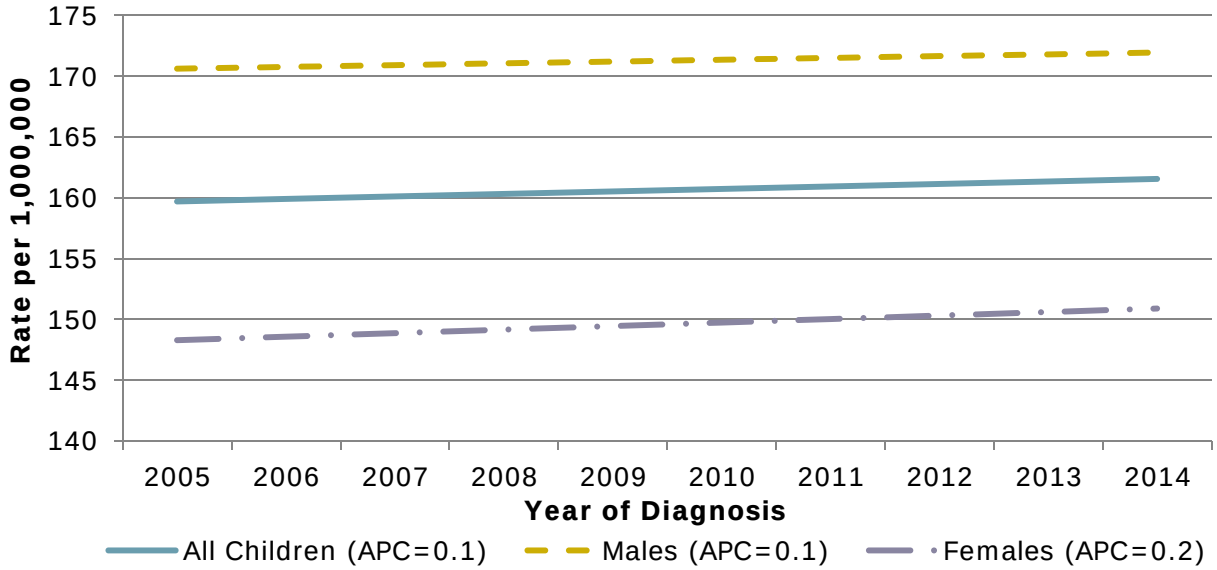
*Includes myelodysplastic syndromes and benign brain/CNS tumors.
^Includes miscellaneous intracranial and intraspinal neoplasms.
†Includes melanomas. ‡Includes trophoblastic tumors and neoplasms of gonads.
Source: California Cancer Registry, California Department of Public Health

Table 11: Adolescent Cancer (15-19 years) Average Incidence Rates and Counts in California, 2011-2015 (Including myelodysplastic syndromes and benign brain/CNS tumors)

Cancer Type	Rate	Count
All cancers combined (including benign brain/CNS tumors)	255.0	3,401
All cancers combined (excluding benign brain/CNS tumors)	222.1	2,962
CNS and miscellaneous intracranial and intraspinal neoplasms	51.4	685
Other malignant epithelial neoplasms and melanomas	49.3	657
Lymphomas and reticuloendothelial neoplasms	44.5	594
Leukemias, myeloproliferative & myelodysplastic diseases	39.4	525
Germ cell & trophoblastic tumors & neoplasms of gonads	36.2	483
Soft tissue and other extraosseous sarcomas	17.0	227
Malignant bone tumors	13.4	179
Renal tumors	1.6	21
Hepatic tumors	1.0	13
Other and unspecified malignant neoplasms	0.7	9
Neuroblastoma and other peripheral nervous cell tumors	0.5	7
Retinoblastoma	0.1	1

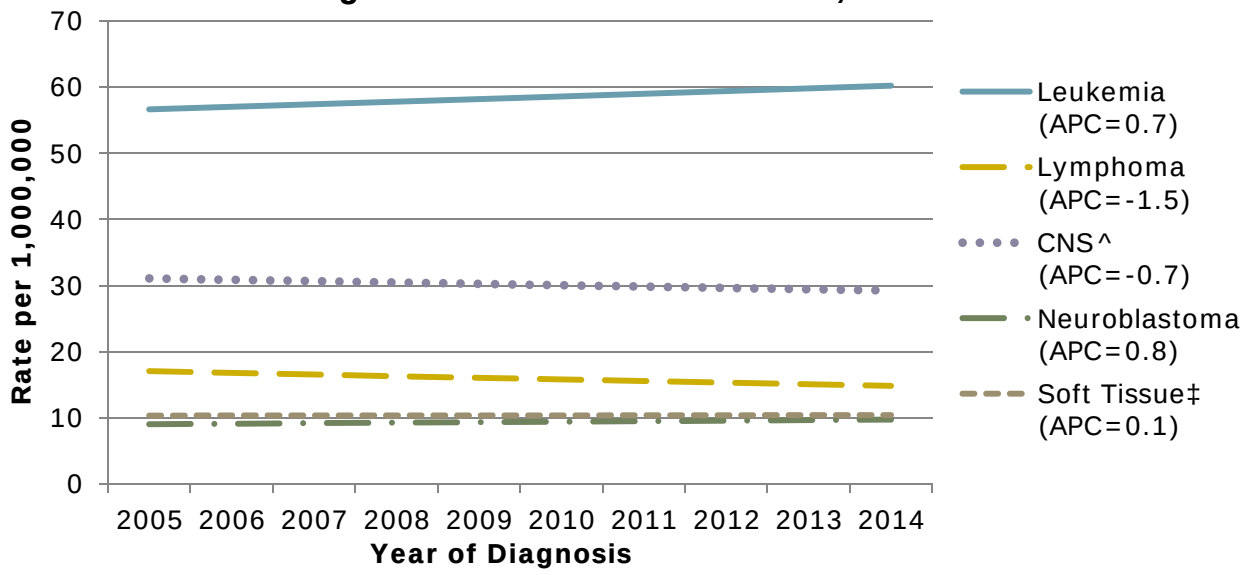
Rates are per 1,000,000 and age-adjusted to the 2000 US Standard Population.
Source: California Cancer Registry, California Department of Public Health

Figure 5: Age-Adjusted Cancer Incidence Trends among Children Ages 0-14 Years in California by Sex, 2005-2014†



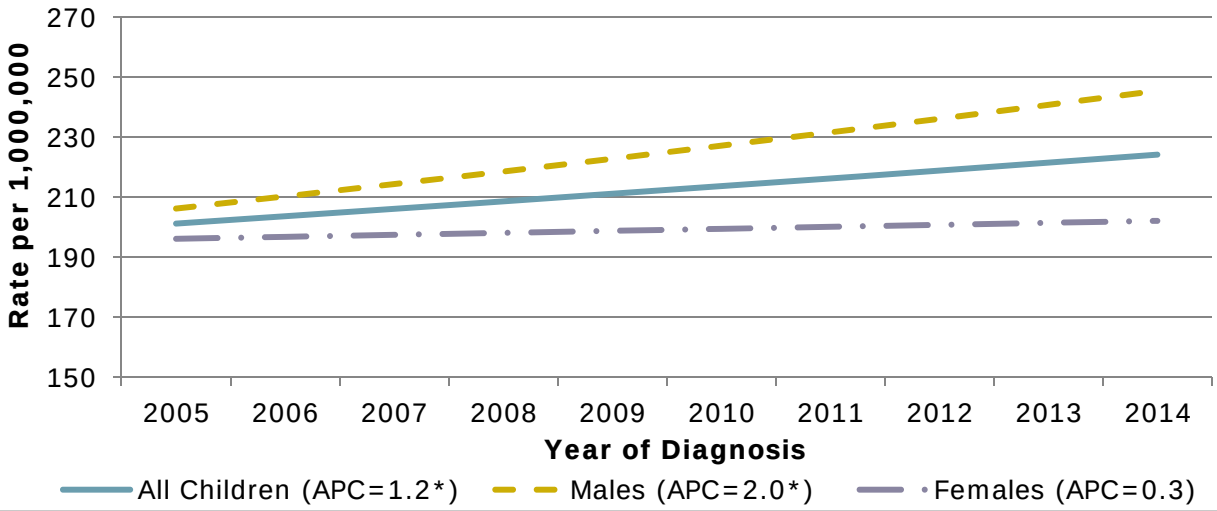
†Excludes myelodysplastic syndromes and benign brain/CNS tumors.
*The annual percent change (APC) is significantly different from zero at p < 0.05.
Source: California Cancer Registry, California Department of Public Health

Figure 6: Age-Adjusted Cancer Incidence Trends for the Most Commonly Diagnosed Cancer Types among Children Ages 0-14 Years in California, 2005-2014†



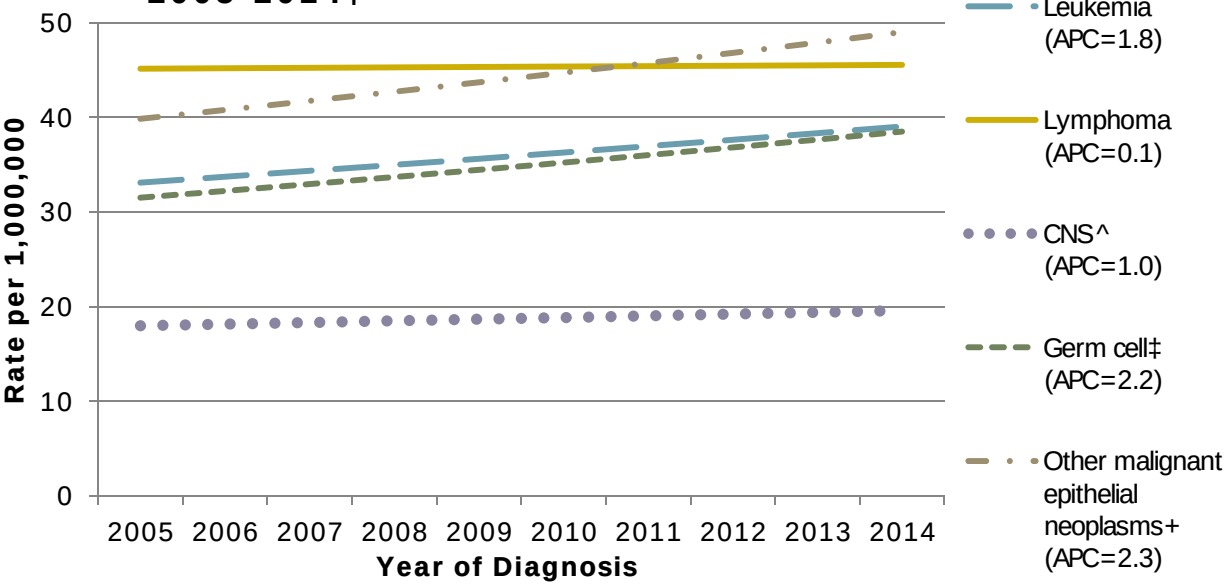
† Excludes myelodysplastic syndromes and benign brain/CNS tumors.
* The annual percent change (APC) is significantly different from zero at p < 0.05.
^ Includes miscellaneous intracranial and intraspinal neoplasms.
‡ Includes other extraosseous sarcomas.
Source: California Cancer Registry, California Department of Public Health

Figure 7: Age-Adjusted Cancer Incidence Trends among Adolescents Ages 15-19 Years in California by Sex, 2005-2014†



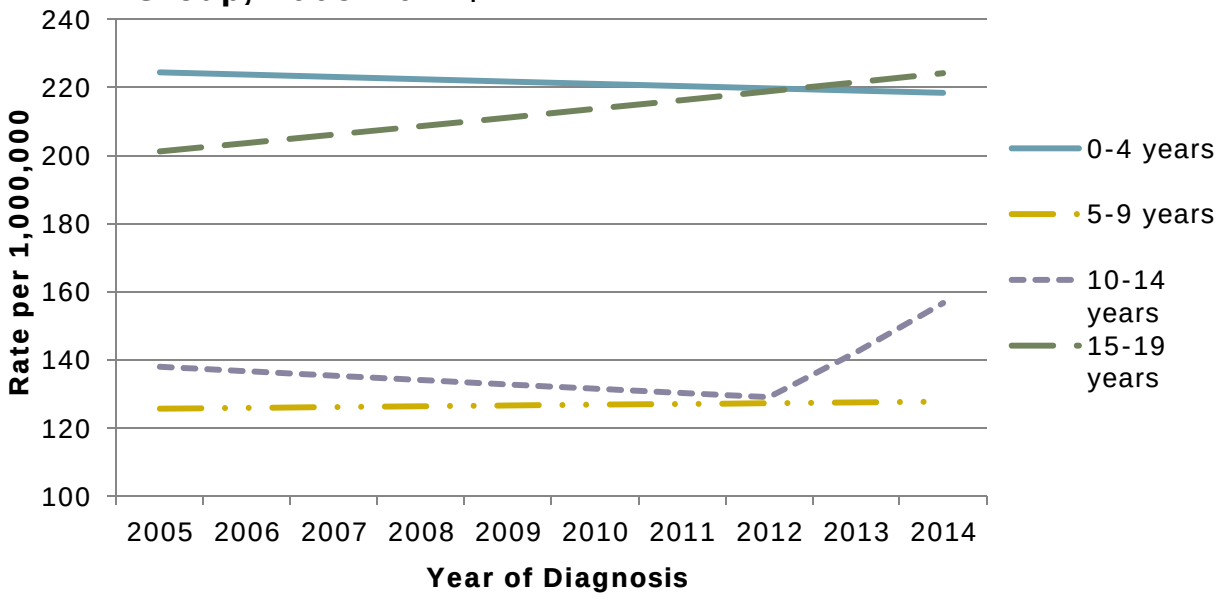
† Excludes myelodysplastic syndromes and benign brain/CNS tumors.
* The annual percent change (APC) is significantly different from zero at p < 0.05.
Source: California Cancer Registry, California Department of Public Health

Figure 8: Age-Adjusted Cancer Incidence Trends for the Most Commonly Diagnosed Cancer Types among Adolescents Ages 15-19 Years in California, 2005-2014†



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

Figure 9: Age-Adjusted Cancer Incidence Trends among Children and Adolescents in California by Age Group, 2005-2014†



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

Table 12: Age-Adjusted Cancer Incidence Trends among Children and Adolescents in California by Age Group, 2005-2014†

Age Group	Time Period	Annual Percent Change (APC)
0-4 years	2005-2014	-0.3
5-9 years	2005-2014	0.2
10-14 years	2005-2012	-1.0
	2012-2014	10.2*
15-19 years	2005-2014	1.2

†Excludes myelodysplastic syndromes and benign brain/CNS tumors.
*APC is significantly different from zero at $p < 0.05$.
Source: California Cancer Registry, California Department of Public Health

Table 13: Five-Year Relative Survival (Percentage) by International Classification of Childhood Cancer (ICCC) Groups, Age, and Sex in California, 2006-2015

Cancer Type (ICCC Group)	Ages 0-14 years			Ages 15-19 years		
	Total	Male	Female	Total	Male	Female
All cancers combined (excluding benign brain/CNS Tumors)	82.2	81.9	82.5	82.8	80.9	85.1
All cancers combined (including benign brain/CNS Tumors)	82.2	81.8	82.6	82.2	81.8	82.6
Leukemias (including myelodysplastic syndromes)	85.1	84.3	86.1	70.3	71.6	68.3
Lymphomas and reticuloendothelial neoplasms	93.6	94.1	92.5	93.9	92.9	94.9
CNS and other intracranial and intraspinal neoplasms (includes benign brain/CNS tumors)	69.7	70.6	68.8	75.2	74.9	75.6
Neuroblastoma and other peripheral nervous cell tumors	78.2	76.4	79.9	-	-	-
Retinoblastoma	97.0	93.9	100.0	-	-	-
Renal tumors	87.8	84.6	90.5	63.9	-	-
Hepatic tumors	77.2	77.3	76.7	58.4	-	-
Malignant bone tumors	71.3	71.6	70.9	63.3	62.3	64.9
Soft tissue and other extraosseous sarcomas	72.4	73.0	71.6	68.3	63.2	73.0
Germ cell, trophoblastic tumors, neoplasms of gonads	93.5	95.9	91.4	92.1	92.3	91.2
Other malignant epithelial neoplasms and melanomas	90.7	89.5	91.3	91.2	83.2	94.5

*Follow-up is through December 2015.
Five-year relative survival was not calculated when there were less than 25 cases.
Source: California Cancer Registry, California Department of Public Health

Technical Notes

Incidence: This report includes cases of cancer diagnosed between January 1, 1988 and December 31, 2015, and reported to the California Cancer Registry (CCR) as of January 7, 2018. A “case” is defined as a primary cancer. Tumors that result from the spread, or metastasis, of a primary cancer to another organ are not considered 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). Cases that were reported from the Department of Veterans Affairs were not included in this report. Standards for data abstracting, collection, and reporting are specified by the CCR. Only cases diagnosed among California residents are included in this report. Individuals who were treated for cancer in California, but were residents of another state or country are not included.

Mortality: 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 according to the International Classification of Disease, 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.

Prevalence (Existing Cases): The number of existing cases, also known as prevalence, accounts for all Californians alive today that have a history of the cancer since January 1, 1988. These existing cases include individuals that no longer have evidence of cancer or those undergoing treatment that still have evidence of the disease.

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 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. The statistical significance of observed differences in age-adjusted rates was determined by comparing 95 percent confidence intervals around each rate. A 95% confidence interval is the range of values that is estimated to contain the true population value 95% of the time. Whenever confidence intervals overlapped differences were deemed non-significant, otherwise they were considered significant at alpha = 0.05. Rates in this report were calculated using the Surveillance Research Program, National Cancer Institute, SEER*Stat software version 8.3.2 or higher (https://seer.cancer.gov/seerstat).

Annual Percent Change: The estimated annual percent change (APC) represents the average percent increase or decrease in cancer rates per year over a specified time period. 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 value: $\ln(r) = m(\text{year}) + b$. From the slope of the regression line, the APC is calculated as $APC = 100*(e^m - 1)$. 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 Statistical Research and Applications Branch, National Cancer Institute, JoinPoint Regression Software version 4.3.1 or higher was used for all trend analyses in this report (https://surveillance.cancer.gov/joinpoint).

Average Annual Percent Change: The Average Annual Percent Change (AAPC) is a summary measure of a trend over a pre-specified fixed interval. It allows the use of 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 APCs from the joinpoint model, with the weights equal to the length of the APC interval.