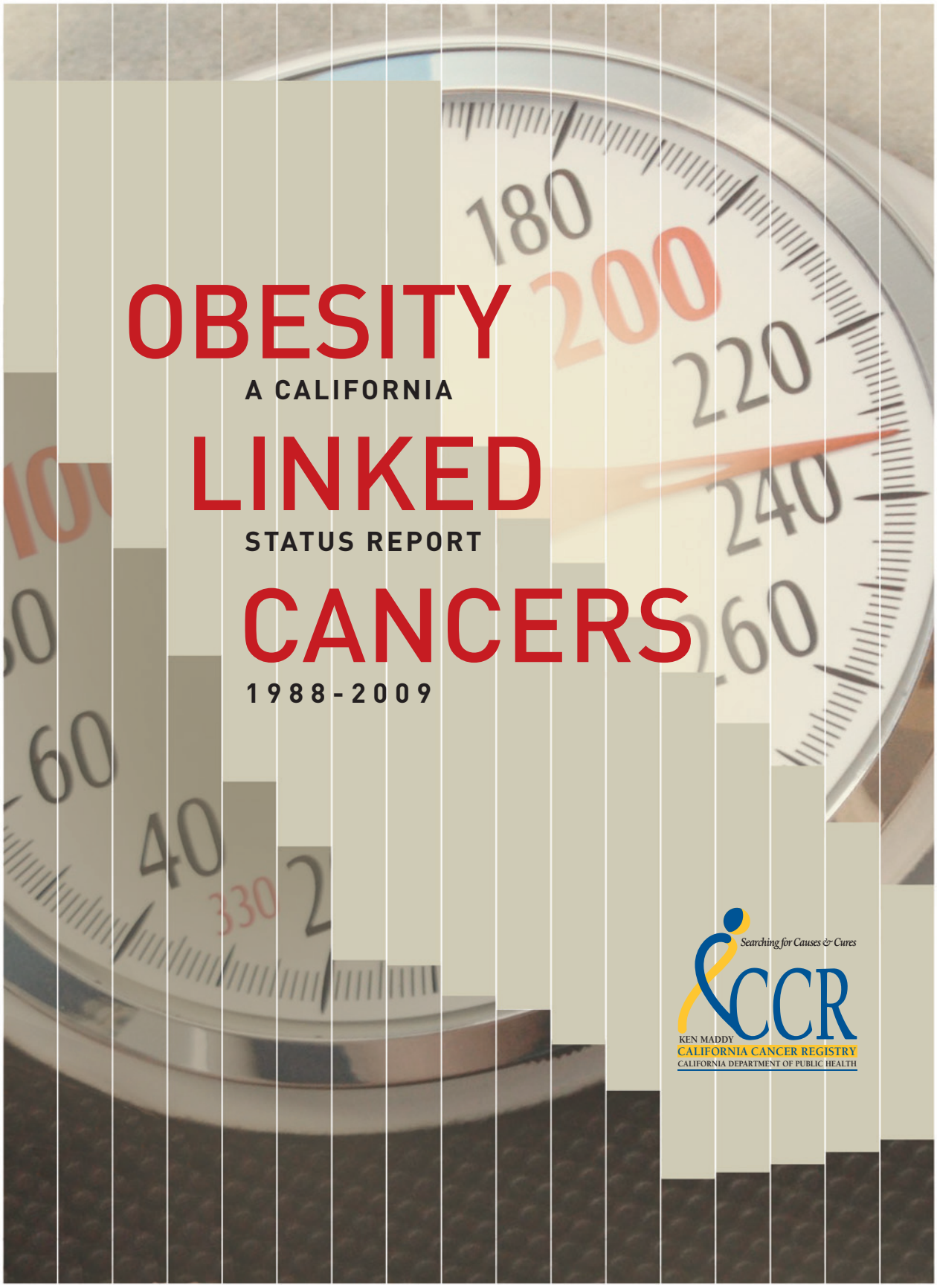

OBESITY

A CALIFORNIA

LINKED

STATUS REPORT

CANCERS

1988-2009

Searching for Causes & Cures

CCR

KEN MADDY
CALIFORNIA CANCER REGISTRY
CALIFORNIA DEPARTMENT OF PUBLIC HEALTH

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INSTITUTE FOR POPULATION HEALTH IMPROVEMENT

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

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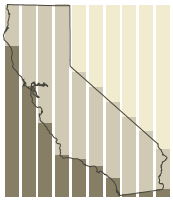

Obesity-Linked Cancers:
A California Status Report 1988-2009

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OBESITY-LINKED CANCER IN CALIFORNIA

Obesity in California

OVERVIEW

Obesity is often described as a problem of epidemic proportions, both in the state of California and across the entire country. It is important to draw awareness not just to the problem of obesity but also to the many health conditions that are associated with it. Obesity's impacts on health are far reaching and can include such chronic conditions as coronary heart disease, type 2 diabetes, hypertension and certain types of cancer. This report will focus on obesity in California and will specifically highlight the incidence and mortality rates of the types of cancer that have been linked to obesity and how these rates have changed since 1988.

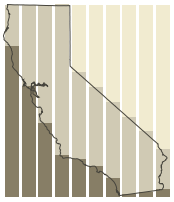
OBESITY AND OVERWEIGHT DEFINED

The terms ***overweight*** and ***obesity*** refer to conditions in which a person's body weight is greater than what is generally considered healthy for a given height.[1] The terms refer to ranges of weight that have been shown to increase the likelihood of certain diseases and adverse health conditions and are determined by calculating one's ***body mass index*** (BMI), a measurement that correlates with the amount of body fat.[2] An adult with a BMI between 25 and 29.9 is considered ***overweight***, while a BMI of 30 or greater is considered ***obese***.

OBESITY AND CALIFORNIANS

The number of Californians who are overweight or obese can be determined from the California Health Interview Survey (CHIS), a health-related survey of a statistically representative sample of California's diverse population that is taken every two years. (See the Technical Notes at the end of this report for more details about the CHIS.) According to the 2009 CHIS, 22.7 percent of California adults[3] are obese (based on BMI), including 24.0 percent of adult males and 21.5 percent of adult females.

Obesity rates vary substantially by race/ethnicity: 43.2 percent of American-Indian/ Alaska Native, 29.9 percent of Latino, 27.6 percent of African-American, 24.0 percent



1 CDC: *www.cdc.gov/obesity/defining.html*

2 Although BMI correlates with the amount of body fat, BMI does not directly measure body fat.

3 18 years of age or older

of adults who reported two or more races, 23.9 percent of Native Hawaiian/Pacific Islander, 21.1 percent of white and 7.2 percent of Asian adults are obese.

THE ADVERSE IMPACT OF OBESITY ON HEALTH

Physiologically, overweight and obesity are the result of consuming more calories than are expended through the body's basic metabolic processes and physical activity. But the obesity problem is much more complicated than this. Many factors contribute to obesity, including genetic, metabolic, behavioral, environmental, cultural and socio-economic factors. A discussion of these issues is beyond the scope of this report, and readers are referred to ***The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity, 2001***,[4] and the ***2010 California Obesity Prevention Plan***,[5] among other sources, for a more detailed discussion of the subject.

In addition to the various contributing factors to obesity, there are also numerous health conditions associated with being overweight or obese. These include:[6]

- Coronary heart disease
- Type 2 diabetes
- Hypertension (high blood pressure)
- Dyslipidemia (for example, high total cholesterol or high levels of triglycerides)
- Stroke
- Liver and gallbladder disease
- Sleep apnea and respiratory problems
- Osteoarthritis (a degeneration of cartilage and its underlying bone within a joint)
- Gynecological problems (abnormal menses, infertility)
- Certain types of cancer have also been associated with obesity (including breast in postmenopausal women, colorectal, endometrial [the lining of the uterus], kidney and esophageal adenocarcinomas)[7]

4 *www.surgeongeneral.gov/topics/obesity*

5 *www.cdph.ca.gov/programs/COPP/Pages/CaliforniaObesityPreventionPlan.aspx*

6 CDC: *www.cdc.gov/obesity/causes/health.html*; NIH, NHLBI Obesity Education Initiative. *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults.* Available online: *www.nhlbi.nih.gov/guidelines/obesity/ob_gdlns.pdf*

7 NCI Factsheet on Obesity and Cancer Risk, *www.cancer.gov/cancertopics/factsheet/Risk/Obesity*

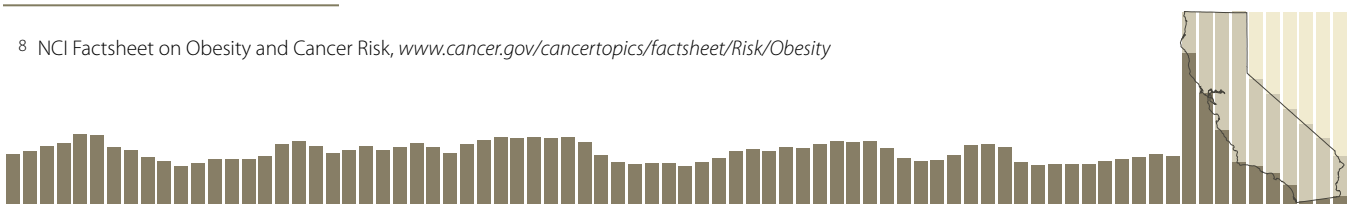
OBESITY AND CANCER

The remainder of this report will focus on the incidence and mortality rates of five types of cancer that have been linked to obesity: breast cancer in postmenopausal women (defined as women age 50 and older), colorectal cancer, endometrial cancer, kidney cancer, and esophageal cancer (adenocarcinomas); and how these rates have changed since 1988.

The precise causal links between obesity and cancer have not been determined, but probably include one or more of the following mechanisms, acting alone or in combination:[8]

- Fat tissue produces excess amounts of estrogen, high levels of which have been associated with the risk of breast, endometrial, and some other cancers.
- Obese people often have increased levels of insulin and insulin-like growth factor-1 (IGF-1) in their blood (hyperinsulinemia), which may promote the development of certain tumors.
- Fat cells produce adipokines, hormones that may affect cell growth.
- Fat cells may affect other tumor growth regulators.
- Obese persons often have chronic low-level (subacute) inflammation, which has been associated with increased cancer risk.

8 NCI Factsheet on Obesity and Cancer Risk, *www.cancer.gov/cancertopics/factsheet/Risk/Obesity*



OBESITY-LINKED: BREAST CANCER

Postmenopausal Breast Cancer

INCIDENCE & MORTALITY TRENDS, CALIFORNIA 1988-2009

Breast cancer is the most commonly occurring cancer among females in California. Some 22,850 California women were projected to be diagnosed with breast cancer in 2013, and 4,335 were expected to die from the disease. Overweight and obesity are associated with a modest increase in the occurrence of breast cancer in postmenopausal women.[9]

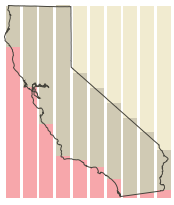
The incidence rate of postmenopausal breast cancer in California in 2009 was 338.7 cases per 100,000 females, and the mortality rate was 67.7 deaths per 100,000 females (Table 1). Non-Hispanic white females had the highest incidence rate (391.1 new cases per 100,000 females), while African-American females had the highest mortality rate (100.1 deaths per 100,000 females).

Table 1. Postmenopausal Breast Cancer Incidence and Mortality Rates, California, 2009†

	Incidence	Mortality
All Females	**338.7**	**67.7**
Non-Hispanic Whites	391.1	74.8
African-Americans	348.4	100.1
Hispanics	238.9	54.1
Asian/Pacific Islanders	236.9	40.1

† For statistical purposes, *postmenopausal* is defined as women age 50 years and older. Rates are per 100,000 and age-adjusted to the 2000 US Standard Poplulation.

Source: California Cancer Registry, California Department of Public Health.
Prepared by the California Department of Public Health, California Cancer Registry.



[9] NCI Factsheet on Obesity and Cancer Risk, *www.cancer.gov/cancertopics/factsheet/Risk/Obesity*

POSTMENOPAUSAL BREAST CANCER TRENDS BY RACE/ETHNICITY

Tables 2 and 3 show the variation in postmenopausal breast cancer incidence and mortality rate trends by race/ethnicity from 1988 to 2009. The incidence rates for all females combined and non-Hispanic white females significantly increased from 1988 to 2001, declined from 2001 to 2004, and then increased again from 2004 through 2009. The incidence rates for Hispanic females followed a similar but less pronounced pattern, while the incidence rates for African-American and Asian/Pacific Islander females steadily increased from 1988 to 2009 (0.67 percent and 1.51 percent per year, respectively).

Mortality rates for all females and for all race/ethnicity groups except Asian/Pacific Islanders declined significantly from 1988 to 2009. Breast cancer mortality for Asian/Pacific Islander women remained relatively stable.

Table 2. Postmenopausal Breast Cancer Incidence Rate Trends, California, 1988–2009†

	Period	Annual Percent Change
All Females	1988–2001	0.70*
	2001–2004	-4.84
	2004–2009	0.88
Non-Hispanic Whites	1988–2001	1.11*
	2001–2004	-5.36
	2004–2009	0.91
African-Americans	1988–2009	0.67*
Hispanics	1988–1994	-0.81
	1994–1999	2.46*
	1999–2004	-1.82
	2004–2009	1.30*
Asian/Pacific Islanders	1988–2009	1.51*

† For statistical purposes, *postmenopausal* is defined as women age 50 years and older.
* The Annual Percent Change is statistically significantly different from zero ($p<0.05$)

Source: California Cancer Registry, California Department of Public Health.
Prepared by the California Department of Public Health, California Cancer Registry.

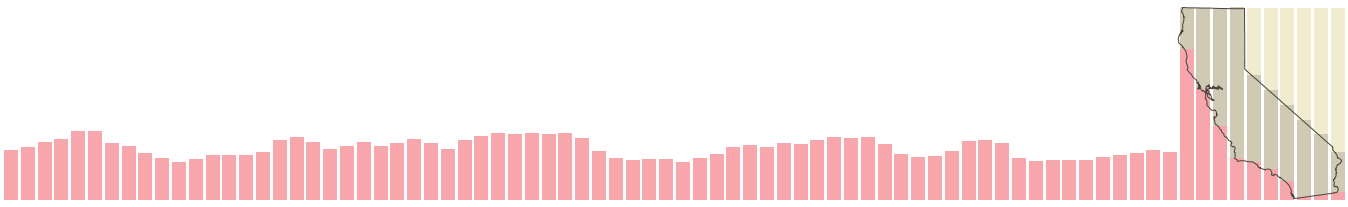


Table 3. Postmenopausal Breast Cancer Mortality Rate Trends, California, 1988–2009†

	Period	Annual Percent Change
All Females	1988–1994	-0.95*
	1994–1998	-3.47*
	1998–2009	-1.45*
Non-Hispanic Whites	1988–2009	-1.78*
African-Americans	1988–2009	-0.63*
Hispanics	1988–2009	-1.03*
Asian/Pacific Islanders	1988–2009	0.04

† For statistical purposes, *postmenopausal* is defined as women age 50 years and older.
* The Annual Percent Change is statistically significantly different from zero ($p<0.05$)

Source: California Cancer Registry, California Department of Public Health.
Prepared by the California Department of Public Health, California Cancer Registry.

BREAST CANCER SCREENING

Both the U.S. Preventive Services Task Force (USPSTF) and the American Cancer Society (ACS) recommend breast cancer screening as a means for early breast cancer detection. The USPSTF recommends regular, biennial screening mammography for women aged 50 to 74 years and also states that a decision to start younger than age 50 should be based on a woman's individual risk factors and other circumstances and her personal values regarding the benefits and harms of screening with mammography.[10] Alternatively, the ACS recommends that women age 40 and older should have a mammogram every year and should do so for as long as they are in good health.[11]

The most recent data from the CHIS (Table 4) indicate that 65.6 percent of all female Californians 30 years or older have had a screening mammogram within the last two years and 11.5 percent had one more than two years earlier; 22.9 percent of women report never having had a mammogram.

The 2009 CHIS data also show that 56.9 percent of Hispanic, 63.4 percent of Asian, 68.0 percent of Native Hawaiian/Pacific Islander, 70.5 percent of non-Hispanic white, and 72.3 percent of African-American females had a mammogram in the two years before the survey (Table 5). More Hispanic females (33.4 percent) reported having never had a mammogram than any other race/ethnicity category.

10 *www.uspreventiveservicestaskforce.org/uspstf/uspsbrca.htm*
11 *www.cancer.gov/Healthy/FindCancerEarly/CancerScreeningGuidelines/american-cancer-society-guidelines-for-the-early-detection-of-cancer*

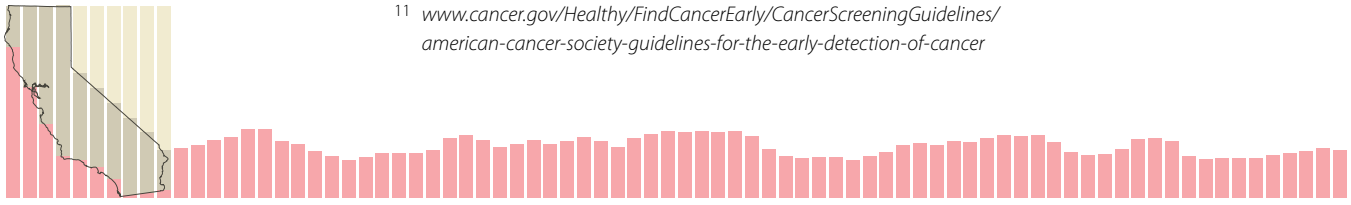


Table 4. Mammogram Screening History*

Screening Interval	All Females 30 Years of Age or Older
Two years or less	65.6%
More than two years ago	11.5%
Never had a mammogram	22.9%
Total:	100.0%

* 2009 California Health Interview Survey (CHIS). Asked of all women 30 years of age or older.

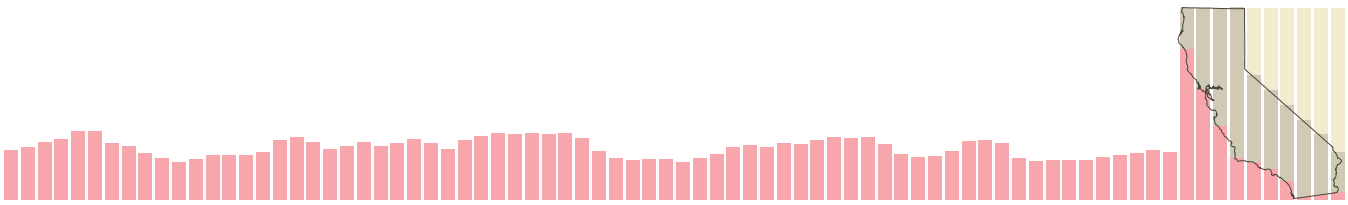
Prepared by the California Department of Public Health, California Cancer Registry.

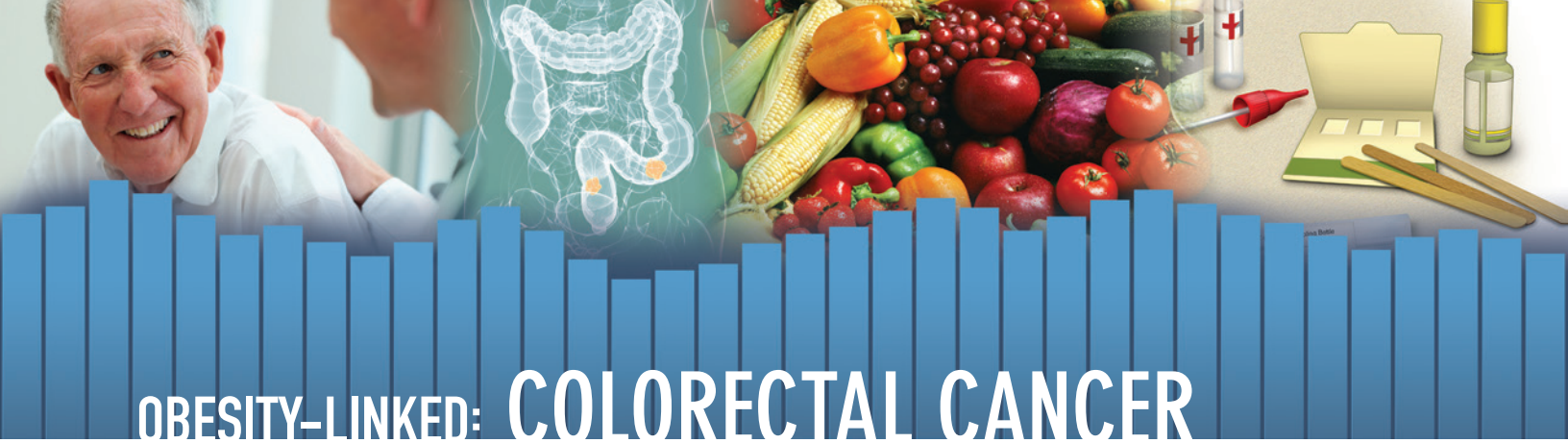
Table 5. Mammogram Screening History, By Race/Ethnicity*

Screening Interval	Non-Hispanic Whites	African Americans	Hispanics	Asians	Native Hawaiian/ Pacific Islanders	All
Two years or less	70.5%	72.3%	56.9%	63.4%	68.0%~	**65.6%**
More than two years ago	12.5%	10.8%	9.7%	11.8%	4.7%~	**11.5%**
Never had a mammogram	17.0%	16.9%	33.4%	24.7%	27.3%~	**22.9%**
Totals:	100.0%	100.0%	100.0%	100.0%	100.0%	**100.0%**

~ Statistically unstable data
* 2009 California Health Interview Survey (CHIS). Asked of all women 30 years of age or older.

Prepared by the California Department of Public Health, California Cancer Registry.





OBESITY-LINKED: COLORECTAL CANCER

Colorectal Cancer

INCIDENCE & MORTALITY TRENDS, CALIFORNIA 1988-2009

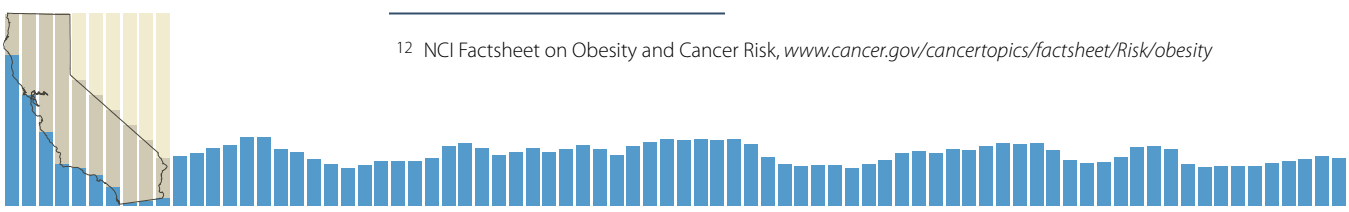
Colorectal cancer is the third most commonly diagnosed cancer and the third most common cause of cancer-related deaths among both male and female Californians. Some 14,120 Californians were projected to be newly diagnosed with colorectal cancer in 2013, and 5,125 were expected to die from the disease.

A higher BMI is strongly associated with an increased risk of colorectal cancer for males.[12] The strongest association is found with abdominal obesity as measured by waist circumference. The same association exists for females, albeit weaker.

Table 6 shows that in 2009, the overall colorectal cancer incidence rate for Californians was 41.6 cases per 100,000 persons, and the mortality rate was 14.5 deaths per 100,000 persons. The incidence rate was 48.5 new cases per 100,000 males, and 36.1 new cases per 100,000 females. The mortality rate was 17.5 deaths per 100,000 males, and 12.2 deaths per 100,000 females.

Colorectal cancer incidence and mortality rates varied by race/ethnicity, with African-American males and females having the highest incidence (62.6 and 52.5 new cases per 100,000 persons, respectively) and mortality rates (25.3 and 20.4 deaths per 100,000 persons, respectively).

Table 7 shows that from 1988 to 1995, the incidence rate of colorectal cancer overall and for females declined significantly (-1.89 and -2.09 percent per year, respectively), then increased until 1998, before again declining each year through 2009. The incidence for males declined each year from 1988 to 2009 (-1.62 percent per year).



[12] NCI Factsheet on Obesity and Cancer Risk, *www.cancer.gov/cancertopics/factsheet/Risk/obesity*

COLORECTAL CANCER INCIDENCE & MORTALITY RATES

Table 6. Colorectal Cancer Incidence and Mortality Rates, California, 2009†

	Incidence	Mortality
All California	**41.6**	**14.5**
Males	48.5	17.5
Females	36.1	12.2
Males, by Race/Ethnicity		
Non-Hispanic Whites	49.2	17.8
African-Americans	62.6	25.3
Hispanics	43.0	16.4
Asian/Pacific Islanders	45.0	14.3
Females, by Race/Ethnicity		
Non-Hispanic Whites	37.0	12.8
African-Americans	52.5	20.4
Hispanics	28.4	9.4
Asian/Pacific Islanders	34.1	10.0

† Rates are per 100,000 and age-adjusted to the 2000 US Standard Poplulation.

Source: California Cancer Registry, California Department of Public Health.
Prepared by the California Department of Public Health, California Cancer Registry.

Table 7. Colorectal Cancer Incidence Rate Trends, California, 1988–2009

	Period	Annual Percent Change
All California	1988–1995	-1.89*
	1995–1998	0.52
	1998–2009	-1.86*
Males	1988–2009	-1.62*
Females	1988–1995	-2.09*
	1995–1998	1.14
	1998–2009	-1.77*
Males, by Race/Ethnicity		
Non-Hispanic Whites	1988–2000	-1.53*
	2000–2009	-2.23*
African-Americans	1988–2009	-0.83*
Hispanics	1988–2009	-0.17
Asian/Pacific Islanders	1988–2009	-1.02*
Females, by Race/Ethnicity		
Non-Hispanic Whites	1988–1994	-2.47*
	1994–1997	1.18
	1997–2009	-1.70*
African-Americans	1988–2009	-0.74*
Hispanics	1988–2009	-0.46*
Asian/Pacific Islanders	1988–2009	-0.30

* The Annual Percent Change is statistically significantly different from zero ($p<0.05$)

Source: California Cancer Registry, California Department of Public Health.
Prepared by the California Department of Public Health, California Cancer Registry.

COLORECTAL CANCER INCIDENCE RATE TRENDS BY RACE/ETHNICITY

Non-Hispanic white, African-American and Asian/Pacific Islander males experienced statistically significant decreases in colorectal cancer incidence rates from 1988 to 2009, while the incidence rates for Hispanic males remained relatively stable. African-American and Hispanic females experienced a statistically significant decline in colorectal cancer incidence rates from 1988 to 2009, while non-Hispanic white females decreased significantly between 1988 and 1994, increased slightly until 1997, and then again decreased significantly through 2009. Asian/Pacific Islander females showed only a slightly decreased incidence rate during this time.

Table 8 shows that colorectal cancer mortality rates declined significantly for both male and female Californians from 1988 to 2009, and for all race/ethnicity groups except Hispanic males.

Table 8. Colorectal Cancer Mortality Rate Trends, California, 1988–2009

	Period	Annual Percent Change
All California	1988–2009	-2.14*
Males	1988–2009	-2.22*
Females	1988–2009	-2.19*
Males, by Race/Ethnicity		
Non-Hispanic Whites	1988–2009	-2.45*
African-Americans	1988–2009	-1.03*
Hispanics	1988–2009	-0.42
Asian/Pacific Islanders	1988–2009	-1.88*
Females, by Race/Ethnicity		
Non-Hispanic Whites	1988–2009	-2.27*
African-Americans	1988–2009	-1.53*
Hispanics	1988–2009	-0.99*
Asian/Pacific Islanders	1988–2009	-1.51

* The Annual Percent Change is statistically significantly different from zero ($p<0.05$)

Source: California Cancer Registry, California Department of Public Health.
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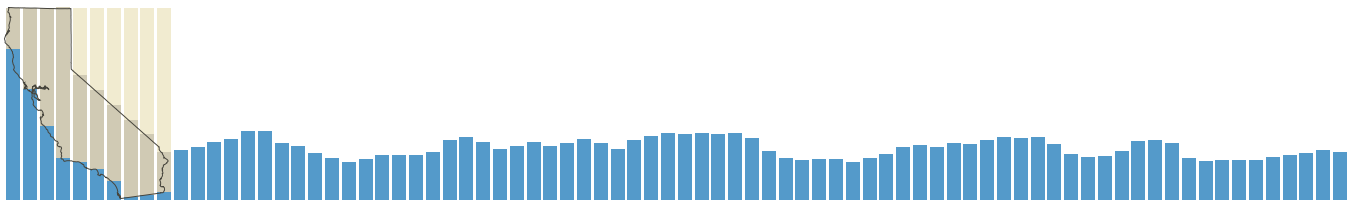


COLORECTAL CANCER SCREENING

Similar to breast cancer, medical tests can detect colorectal cancer at an early stage. The USPSTF recommends screening for colorectal cancer using fecal occult blood testing, sigmoidoscopy or colonoscopy, beginning at age 50 and continuing until age 75 years. The risks and benefits of these screening methods vary.[13] Screening can find colorectal cancer at an early stage and even prevent colorectal cancer from occurring because it can find and remove precancerous growths.

The 2009 CHIS data (Table 9) show that 78.0 percent of all Californians report having had a sigmoidoscopy, colonoscopy, or fecal occult blood test (FOBT) at least once in their life. For both men and women, of those reporting ever having had one of the screening tests, 54.1 percent reported having had a colonoscopy, 10.0 percent sigmoidoscopy and 35.9 percent FOBT (Table 10).

Table 9. Colorectal Cancer Screening History*

Ever had sigmoidoscopy, colonoscopy, or FOBT	Males	Females	All
Never had any of them	22.7%	21.3%	22.0%
Have had one of them	77.3%	78.7%	78.0%
Total:	100.0%	100.0%	100.0%

* 2009 California Health Interview Survey (CHIS). Asked of all respondents 50 years of age or older.

Prepared by the California Department of Public Health, California Cancer Registry.

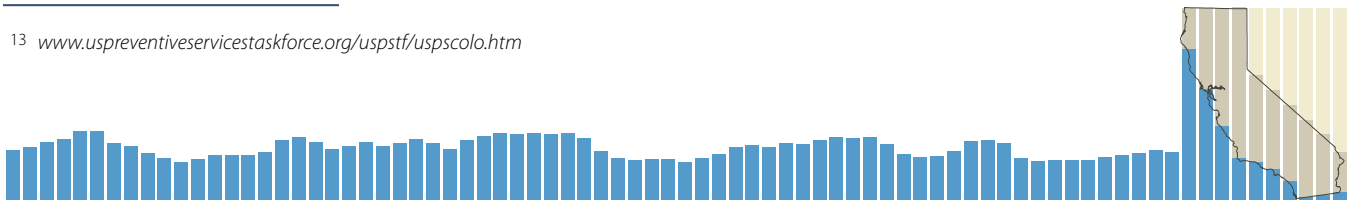
Table 10. Type of Colorectal Cancer Screening Examination*

Type of most recent colorectal cancer screening examination	Males	Females	All
Colonoscopy	54.7%	53.6%	54.1%
Sigmoidoscopy	10.9%	9.2%	10.0%
FOBT	34.4%	37.2%	35.9%
Total:	100.0%	100.0%	100.0%

* 2009 California Health Interview Survey (CHIS). Asked of all respondents 50 years of age or older who have ever had a colorectal cancer screening examination.

Prepared by the California Department of Public Health, California Cancer Registry.

[13] *www.uspreventiveservicestaskforce.org/uspstf/uspscolo.htm*



The 2009 CHIS data also show (Table 11) that Native Hawaiian/Pacific Islanders and non-Hispanic whites were most likely to have ever had a sigmoidoscopy, colonoscopy or FOBT. Conversely, Hispanics were the least likely to have ever had one of the colorectal cancer screening tests. Most often, colonoscopy was reported by all race/ethnicity groups as the most recent type of colorectal cancer screening, followed by FOBT (Table 12).

Table 11. Colorectal Cancer Screening History, By Race/Ethnicity*

Ever had sigmoidoscopy, colonoscopy, or FOBT	Non-Hispanic Whites	African Americans	Hispanics	Asians	Native Hawaiian/ Pacific Islanders	All
Never had any of them	17.6%	22.5%	32.5%	25.9%	12.8%~	**22.0%**
Have had one of them	82.4%	77.5%	67.5%	74.1%	87.2%~	**78.0%**
Totals:	100.0%	100.0%	100.0%	100.0%	100.0%	**100.0%**

~ Statistically unstable data
* 2009 California Health Interview Survey (CHIS). Asked of all respondents 50 years of age or older.

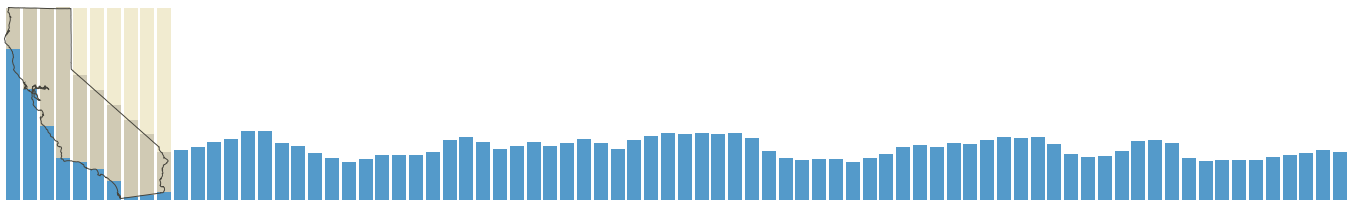
Prepared by the California Department of Public Health, California Cancer Registry.

Table 12. Type of Colorectal Cancer Screening Examination, By Race/Ethnicity*

Type of most recent colorectal cancer screening exam	Non-Hispanic Whites	African Americans	Hispanics	Asians	Native Hawaiian/ Pacific Islanders	All
Colonoscopy	56.4%	54.0%	48.4%	49.7%	56.0%	**54.1%**
Sigmoidoscopy	9.5%	12.0%	10.5%	12.1%	3.9%~	**10.0%**
FOBT	34.1%	34.0%	41.1%	38.2%	40.2%	**35.9%**
Totals:	100.0%	100.0%	100.0%	100.0%	100.0%	**100.0%**

~ Statistically unstable data
* 2009 California Health Interview Survey (CHIS). Asked of all respondents 50 years of age or older who have ever had a colorectal cancer screening examination.

Prepared by the California Department of Public Health, California Cancer Registry.



OBESITY-LINKED: ENDOMETRIAL CANCER

Endometrial Cancer

Corpus and uterus cancer, not otherwise specified (NOS), is the fourth most commonly diagnosed cancer among females in California and the ninth most common cause of cancer-related death. Some 4,840 female Californians were projected to be diagnosed with corpus and uterus cancer, NOS, in 2013, and 790 were expected to die from the disease.

Endometrial cancer is a specific type of uterine cancer that affects the lining of the uterus and that is associated with being overweight or obese.[14]

Table 13 shows that the endometrial cancer incidence rate was 22.1 new cases per 100,000 California females and the mortality rate for corpus and uterus cancer, NOS, was 4.0 deaths per 100,000 females. Mortality rates are available only for corpus and uterus cancer, NOS, and not specifically for endometrial cancer. Non-Hispanic white females had the highest (23.9 cases per 100,000 females) and Hispanic and Asian/Pacific Islander females the lowest (18.0 cases per 100,000 females) incidence rates of endometrial cancer. African-American females had the highest (7.7 deaths per 100,000 females) and Asian/Pacific Islander females the lowest (2.7 deaths per 100,000 females) mortality rates for corpus and uterus cancer, NOS.

Table 14 shows the incidence rate trends of endometrial cancer for California females. The earliest data shown are from 1992, when the classification of data specific to endometrial cancer began in California. The incidence rates for all California females and for non-Hispanic white females decreased significantly from 1997 to 2003, after which it has increased significantly, while it has increased significantly since 1992 for African-American, Hispanic and Asian/Pacific Islander females.

INCIDENCE & MORTALITY TRENDS, CALIFORNIA 1988-2009

14 NCI Factsheet on Obesity and Cancer Risk, *www.cancer.gov/cancertopics/factsheet/Risk/obesity*

Table 13. Endometrial Cancer Incidence; and Corpus and Uterus Cancer, NOS, Mortality Rates, California, 2009†

	Incidence	Mortality
All Females	22.1	4.0
Non-Hispanic Whites	23.9	3.8
African-Americans	23.3	7.7
Hispanics	18.0	4.1
Asian/Pacific Islanders	18.0	2.7

† Rates are per 100,000 and age-adjusted to the 2000 US Standard Poplulation.

Source: California Cancer Registry, California Department of Public Health.
Prepared by the California Department of Public Health, California Cancer Registry.

Table 14. Endometrial Cancer Incidence Rate Trends, California, 1992–2009

	Period	Annual Percent Change
All Females	1992–1997	0.78
	1997–2003	-2.13*
	2003–2009	1.78*
Non-Hispanic Whites	1992–1997	1.28
	1997–2003	-2.88*
	2003–2009	1.79*
African-Americans	1992–2009	2.09*
Hispanics	1992–2009	1.01*
Asian/Pacific Islanders	1992–2009	2.20*

* The Annual Percent Change is statistically significantly different from zero ($p<0.05$)

Source: California Cancer Registry, California Department of Public Health.
Prepared by the California Department of Public Health, California Cancer Registry.

Data on mortality rates over time is available only for corpus and uterus cancer, NOS, and not specifically for endometrial cancer (Table 15). For all California females, mortality rates for corpus and uterus, NOS, declined significantly from 1988 through 2001, but then have increased since 2001. Since 1988, mortality rates have increased significantly for African-American and Asian/Pacific Islander females and slightly for Hispanic females, while remaining stable for non-Hispanic white females.

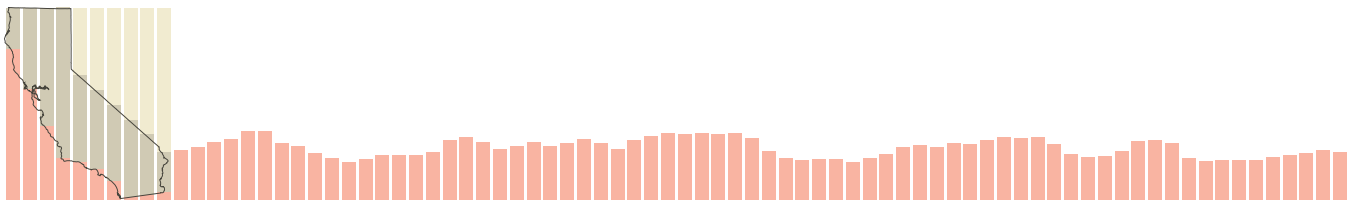


Table 15. Corpus and Uterus Cancer, NOS, Mortality Rate Trends, California, 1988–2009

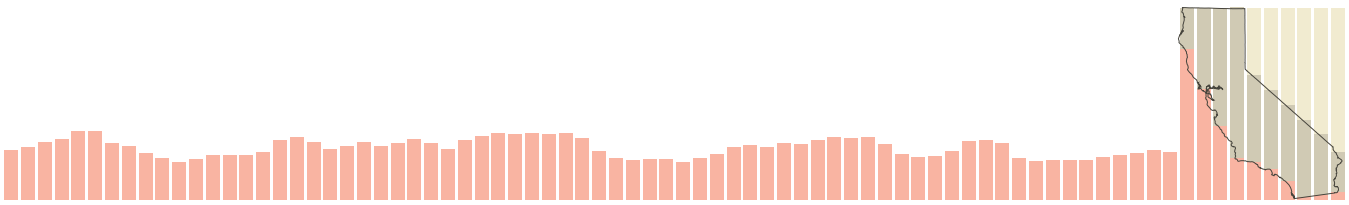
	Period	Annual Percent Change
All Females	1988–2001	-0.80*
	2001–2009	0.86
Non-Hispanic Whites	1988–2009	-0.17
African-Americans	1988–2009	0.86*
Hispanics	1988–2009	0.41
Asian/Pacific Islanders	1988–2009	1.44*

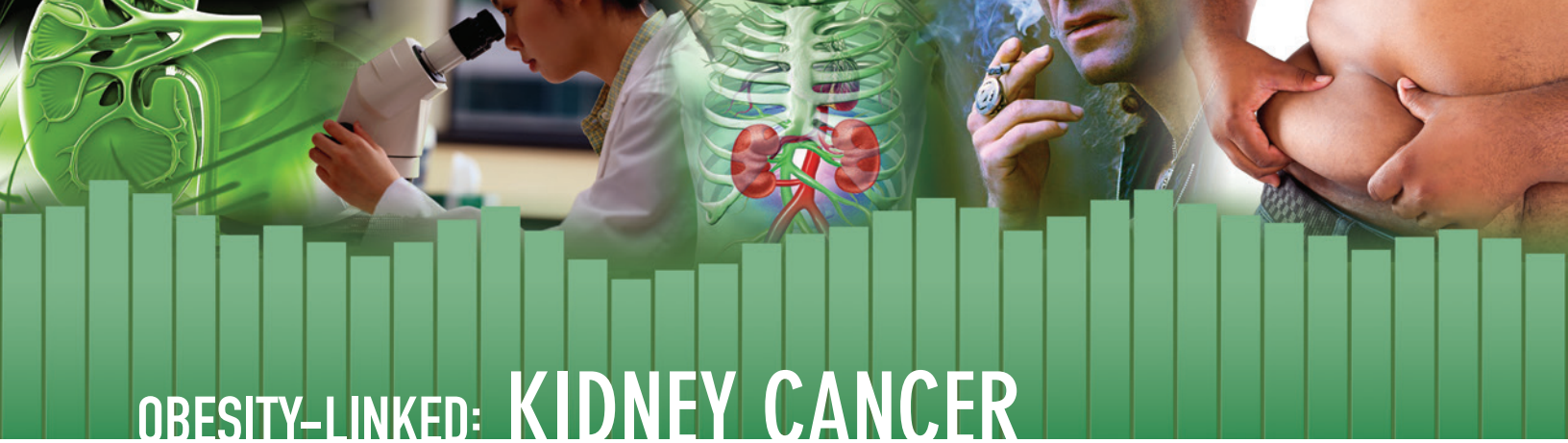
* The Annual Percent Change is statistically significantly different from zero ($p<0.05$)

Source: California Cancer Registry, California Department of Public Health.
Prepared by the California Department of Public Health, California Cancer Registry.

ENDOMETRIAL CANCER SCREENING

No screening tests for endometrial cancer are currently recommended by the USPSTF, ACS, or similar body.





OBESITY-LINKED: KIDNEY CANCER

Kidney Cancer

INCIDENCE & MORTALITY TRENDS, CALIFORNIA 1988-2009

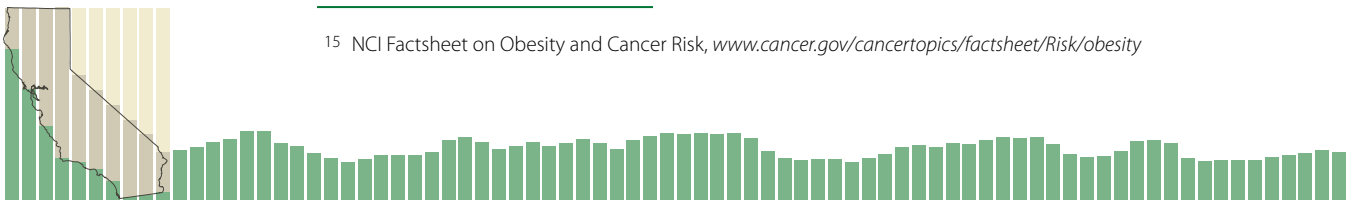
Cancer of the kidney and renal pelvis is the seventh and tenth most commonly diagnosed cancer among Californian males and females, respectively. Some 4,885 Californians were projected to be diagnosed with kidney and renal pelvis cancer in 2013, and 1,240 were expected to die from the disease.

Obesity is associated with renal cell carcinoma, the most common form of kidney cancer, in both men and women.[15]

Table 16 shows that the overall incidence rate of kidney cancer in California in 2009 was 14.4 cases per 100,000 persons, and the mortality rate was 3.5 deaths per 100,000 persons. The incidence rate was 20.1 and 9.8 cases per 100,000 males and females, respectively, while the mortality rate was 5.1 and 2.3 deaths per 100,000 males and females, respectively.

Kidney cancer incidence and mortality rates vary by race/ethnicity, with African-American males and females having the highest incidence rates in 2009 (27.5 and 13.2 new cases per 100,000 persons, respectively) and African-American males and Hispanic females having the highest mortality rates (7.5 and 2.9 deaths per 100,000 persons, respectively).

Table 17 shows that the kidney cancer incidence rates for Californians overall—males, females and all four major race/ethnicity groups—increased significantly from 1988 to 2009. The incidence rates remained fairly stable for non-Hispanic white males from 1988 through 1995, and then increased significantly until 2009.



15 NCI Factsheet on Obesity and Cancer Risk, *www.cancer.gov/cancertopics/factsheet/Risk/obesity*

KIDNEY CANCER INCIDENCE & MORTALITY RATE TRENDS

Table 16. Kidney and Renal Cancer Incidence and Mortality Rates, California, 2009†

	Incidence	Mortality
All California	**14.4**	**3.5**
Males	20.1	5.1
Females	9.8	2.3
Males, by Race/Ethnicity		
Non-Hispanic Whites	21.2	5.1
African-Americans	27.5	7.5
Hispanics	20.7	5.3
Asian/Pacific Islanders	10.9	3.8
Females, by Race/Ethnicity		
Non-Hispanic Whites	9.5	2.2
African-Americans	13.2	2.3
Hispanics	12.0	2.9
Asian/Pacific Islanders	5.1	1.5

† Rates are per 100,000 and age-adjusted to the 2000 US Standard Poplulation.

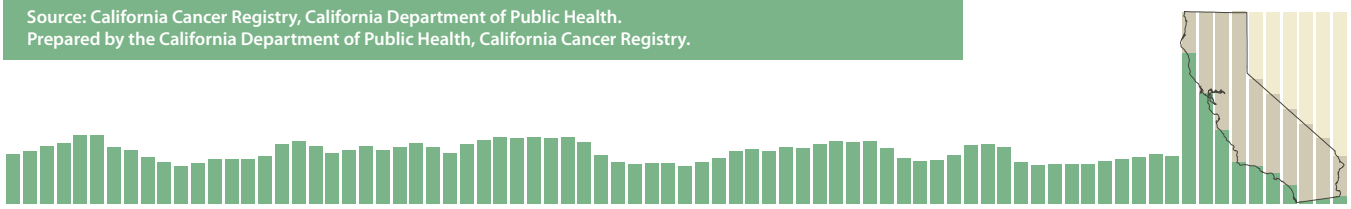
Source: California Cancer Registry, California Department of Public Health.
Prepared by the California Department of Public Health, California Cancer Registry.

Table 17. Kidney and Renal Cancer Incidence Rate Trends, California, 1988–2009

	Period	Annual Percent Change
All California	1988–1999	0.85*
	1999–2009	3.58*
Males	1988–1999	0.78*
	1999–2009	3.53*
Females	1988–1999	0.79*
	1999–2009	3.55*
Males, by Race/Ethnicity		
Non-Hispanic Whites	1988–1995	-0.21
	1995–2009	2.89*
African-Americans	1988–2009	3.19*
Hispanics	1988–2009	2.71*
Asian/Pacific Islanders	1988–2009	2.83*
Females, by Race/Ethnicity		
Non-Hispanic Whites	1988–2000	0.95*
	2000–2009	3.42*
African-Americans	1988–2009	2.68*
Hispanics	1988–2009	2.61*
Asian/Pacific Islanders	1988–2009	2.57*

* The Annual Percent Change is statistically significantly different from zero ($p<0.05$)

Source: California Cancer Registry, California Department of Public Health.
Prepared by the California Department of Public Health, California Cancer Registry.



KIDNEY CANCER INCIDENCE & MORTALITY RATE TRENDS

In contrast to incidence rate trends, kidney cancer mortality rates have declined for some groups in California (Table 18). The mortality rate for all Californians increased slightly from 1988 through 1996 and then decreased significantly through 2009. The mortality rate for males remained relatively stable from 1988 through 2009 while the rate for females declined significantly over this period.

Kidney cancer mortality varies by race/ethnicity. The kidney cancer mortality rate for non-Hispanic white males decreased significantly from 1988 through 2009, and for Hispanic males since 1991, although not significantly. Conversely, mortality rates for Asian/Pacific Islander males increased significantly from 1988 through 2009, and not significantly for African-American males. Mortality rates decreased for non-Hispanic white and African-American females, but only significantly for non-Hispanic white females. Hispanic and Asian/Pacific Islander females experienced non-significant increases in kidney cancer mortality from 1988 through 2009.

KIDNEY CANCER SCREENING

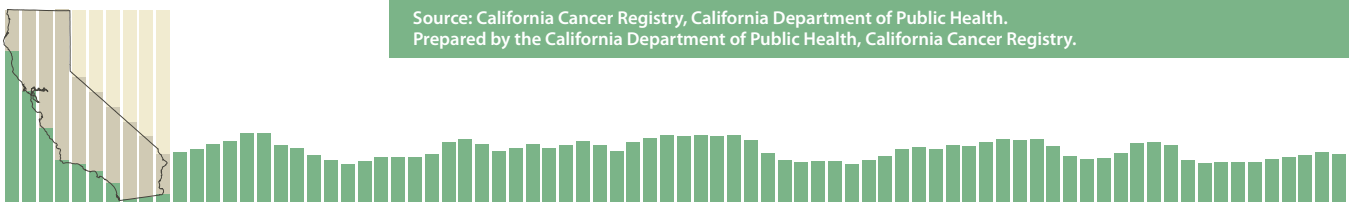
No screening tests for kidney cancer are currently recommended by the USPSTF, ACS, or similar body.

Table 18. Kidney and Renal Pelvis Cancer Mortality Rate Trends, California, 1988–2009

	Period	Annual Percent Change
All California	1988–1996	0.47
	1996–2009	-0.63*
Males	1988–2009	-0.20
Females	1988–2009	-0.53*
Males, by Race/Ethnicity		
Non-Hispanic Whites	1988–2009	-0.45*
African-Americans	1988–2009	1.10
Hispanics	1988–1991	15.49
	1991–2009	-0.65
Asian/Pacific Islanders	1988–2009	1.67*
Females, by Race/Ethnicity		
Non-Hispanic Whites	1988–2009	-1.12*
African-Americans	1988–2009	-0.56
Hispanics	1988–2009	0.36
Asian/Pacific Islanders	1988–2009	1.41

* The Annual Percent Change is statistically significantly different from zero ($p<0.05$)

Source: California Cancer Registry, California Department of Public Health.
Prepared by the California Department of Public Health, California Cancer Registry.



OBESITY-LINKED: ESOPHAGEAL CANCER

Esophageal Cancer (Adenocarcinomas)

Esophageal cancer is the ninth most common type of cancer death among Californian males. Some 1,390 Californians were projected to be diagnosed with esophageal cancer in 2013, and 1,235 were expected to die from the disease.

Overweight and obese males and females are twice as likely to develop esophageal adenocarcinoma, a specific form of esophageal cancer.[16]

In 2009, the overall incidence rate of esophageal adenocarcinoma for California was 2.4 cases per 100,000 persons, and the mortality rate for esophageal cancer was 3.5 deaths per 100,000 persons (Table 19). Mortality rates are available only for esophageal cancers of all types, and not specifically for esophageal adenocarcinoma. The incidence rate was 4.5 and 0.6 cases per 100,000 persons for males and females, respectively. The mortality rate was 6.1 and 1.5 deaths per 100,000 deaths for males and females, respectively.

Esophageal adenocarcinoma incidence and esophageal cancer mortality rates in California vary by race/ethnicity, with non-Hispanic white males and females having the highest incidence (6.0 cases and 0.8 cases per 100,000 persons, respectively) and mortality rates (7.4 and 1.7 deaths per 100,000 persons, respectively) in 2009. African-American women also have the highest mortality rate among females (1.7 deaths per 100,000 persons).

Table 20 shows that from 1988 through 2009, the esophageal adenocarcinoma incidence rates for Californians overall and for males increased significantly, although the increase for males from 1999 through 2009 was not statistically significant. Rates for females could not be calculated because of the small numbers of cases in some groups. The incidence rates increased significantly for

INCIDENCE & MORTALITY TRENDS, CALIFORNIA 1988-2009

16 NCI Factsheet on Obesity and Cancer Risk, *www.cancer.gov/cancertopics/factsheet/Risk/obesity*

Table 19. Esophageal Adenocarcinoma Incidence and Esophageal Cancer Mortality Rates, California, 2009†

	Incidence	Mortality
All California	**2.4**	**3.5**
Males	4.5	6.1
Females	0.6	1.5
Males, by Race/Ethnicity		
Non-Hispanic Whites	6.0	7.4
African-Americans	2.4	4.9
Hispanics	2.6	4.5
Asian/Pacific Islanders	0.9	3.0
Females, by Race/Ethnicity		
Non-Hispanic Whites	0.8	1.7
African-Americans	0.2	1.7
Hispanics	0.3	0.9
Asian/Pacific Islanders	0.3	1.2

† Rates are per 100,000 and age-adjusted to the 2000 US Standard Poplulation.

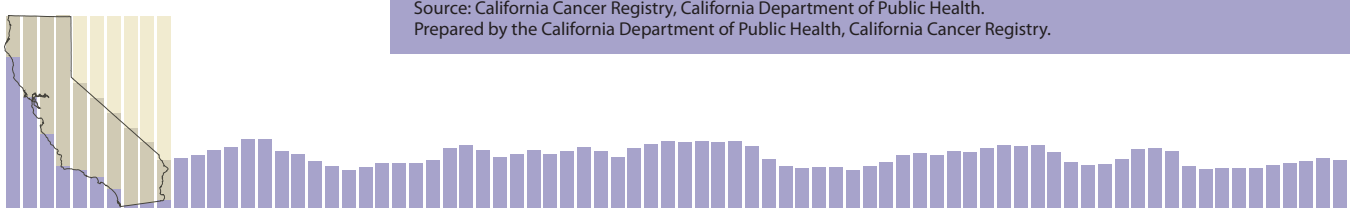
Source: California Cancer Registry, California Department of Public Health.
Prepared by the California Department of Public Health, California Cancer Registry.

Table 20. Esophageal Adenocarcinoma Incidence Rate Trends, California, 1988–2009

	Period	Annual Percent Change
All California	1988–1998	5.44*
	1998–2009	1.05*
Males	1988–1999	4.67*
	1999–2009	0.77
Females	~	~
Males, by Race/Ethnicity		
Non-Hispanic Whites	1988–1999	5.47*
	1999–2009	1.29*
African-Americans	1988–2009	4.82*
Hispanics	1988–2009	1.52*
Asian/Pacific Islanders	1988–2009	0.79
Females, by Race/Ethnicity		
Non-Hispanic Whites	1988–1997	7.90*
	1997–2009	1.45*
African-Americans	~	~
Hispanics	~	~
Asian/Pacific Islanders	~	~

~ Statistic cannot be calculated due to the small number of cases.
* The Annual Percent Change is statistically significantly different from zero ($p<0.05$)

Source: California Cancer Registry, California Department of Public Health.
Prepared by the California Department of Public Health, California Cancer Registry.



non-Hispanic white, African-American, and Hispanic males from 1988 through 2009, while increasing only slightly for Asian/Pacific Islander males.

The incidence rate of esophageal adenocarcinoma increased significantly for non-Hispanic white females from 1988 through 2009, but could not be calculated for African-American, Hispanic, and Asian/Pacific Islander females because of the small number of cases.

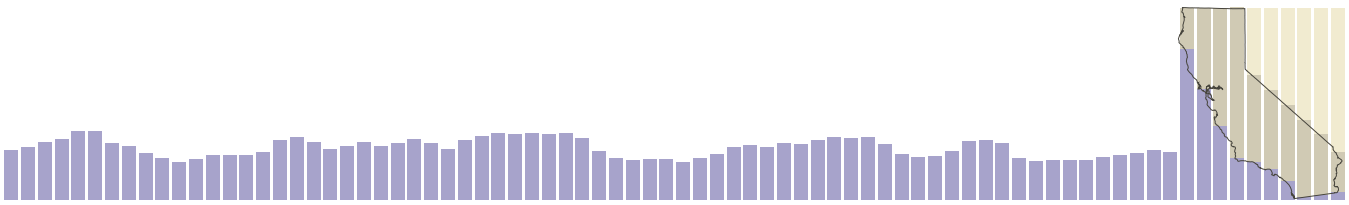
Data on mortality rates over time is available only for esophageal cancers of all types, and not specifically for esophageal adenocarcinoma. The mortality rates shown in Table 21 include deaths from squamous cell esophageal cancer, a smoking-related type of cancer that has declined in California. Esophageal cancer mortality rates overall increased slightly from 1988 through 1999 and then declined significantly from 1999 through 2009 (Table 21). Mortality rates decreased slightly for males from 1988 through 2009 and significantly for females.

Table 21. Esophageal Cancer Mortality Rate Trends, California, 1988–2009

	Period	Annual Percent Change
All California	1988–1999	0.41
	1999–2009	-1.39*
Males	1988–2009	-0.35
Females	1988–2009	-1.09*
Males, by Race/Ethnicity		
Non-Hispanic Whites	1988–2001	1.34*
	2001–2009	-0.49
African-Americans	1988–2009	-4.52*
Hispanics	1988–2009	-0.68
Asian/Pacific Islanders	1988–2009	-2.89*
Females, by Race/Ethnicity		
Non-Hispanic Whites	1988–2009	-0.29
African-Americans	1988–2009	-3.43*
Hispanics	1988–2009	-1.87*
Asian/Pacific Islanders	1988–2009	0.18

* The Annual Percent Change is statistically significantly different from zero ($p<0.05$)

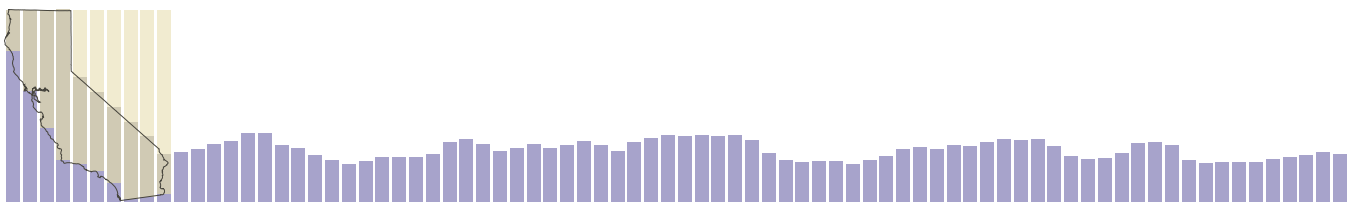
Source: California Cancer Registry, California Department of Public Health.
Prepared by the California Department of Public Health, California Cancer Registry.



From 1988 through 2009, mortality rates declined significantly for African-American and Asian/Pacific Islander males and slightly for Hispanic males. Mortality rates increased significantly from 1988 through 2001 and then declined slightly from 2001 through 2009 for non-Hispanic white males. Mortality rates declined significantly for African-American and Hispanic females from 1988 through 2009, and remained stable for non-Hispanic white and Asian/Pacific Islander females.

ESOPHAGEAL CANCER SCREENING

No screening tests for esophageal cancer are currently recommended by the USPSTF, ACS, or similar body.



Technical Notes

1. Incidence (New Cases)

   This report includes cases diagnosed between January 1, 1988 and December 31, 2009, and reported to the California Cancer Registry (CCR) as of January 2012. A ***case*** is defined as a primary cancer; tumors that result from the spread, or metastasis, of cancer to another organ 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.

   Regional registries covering the entire state report cancer incidence data to the CCR operated by the CalCARES Program at the Institute for Population Health Improvement, UC Davis Health System, for the 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.

2. Mortality (Deaths)

   Computerized files containing information on cancer-related deaths were obtained from the CDPH, Center for Health Statistics. Beginning in 1999, and thereafter, 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.

3. Statistical Methods

   Calculation of Age-Adjusted Rates: Rates 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. 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 due to differences in age distribution between population groups. Rates in this report were calculated using the Surveillance Research Program, National Cancer Institute SEER*Stat software version 6.2.3 *(http://srab.cancer.gov/seerstat)*.

   Annual Percent Change (APC): The estimated annual percent change (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:

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

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

   $$\mathbf{APC = 100*(em-1)}$$

   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 $\alpha = 0.05$. That is, the trend in cancer rates was considered statistically significant if there was less than a five percent chance that the difference was the result of random variation.

   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 3.0 *(http://srab.cancer.gov/joinpoint)* was used for all trend analyses in this report.

Technical Notes *(continued)*

4. Health Behaviors

California Health Interview Survey (CHIS): CHIS, the nation's largest state health survey, began being conducted every two years in 2001. CHIS obtains information on a wide range of health topics and gives a detailed picture of the health and health care needs of California's large and diverse population. The survey provides statewide information on the overall population, including many racial and ethnic groups as well as local-level information on most counties that can be used for health planning and comparative purposes. The survey uses a strict methodology and extensive questionnaires. From asthma, diabetes and obesity to immigrant health and the number of Californians with health insurance, CHIS covers dozens of health-related topics. Many core questions are repeated in each survey in order to measure shifts over time. New questions are also added each survey to address emerging concerns.

CHIS is conducted by the UCLA Center for Health Policy Research in collaboration with the California Department of Public Health and the Department of Health Care Services. Funding for CHIS comes from state and federal agencies and from several private foundations.

Every two years, CHIS conducts random-dial telephone interviews with up to 50,000 or more California households. The persons included in CHIS are a statistically representative sample of the entire state's diverse population. CHIS is especially known for its hard-to-find data on ethnic subgroups. With each survey cycle, CHIS newly selects households to participate in the survey. Beginning in 2007, CHIS also includes a sample of cell-phone-only households—often younger and more mobile Californians frequently overlooked in land-line surveys. Such innovations help CHIS users learn more about an important sub-section of California's ever-changing population. Computers randomly draw telephone numbers for 44 geographic areas that represent 41 individual counties and 3 groupings of counties with smaller populations. For each geographic area, CHIS has a targeted minimum number of people to include. When CHIS contacts a household, one adult is randomly selected to be interviewed. Only that selected person can participate in each household. If there are minor children in the household, CHIS also asks questions about the adolescents and younger children. Additionally, CHIS uses many techniques to interview enough people from many ethnic groups to provide a strong basis for understanding most major and minor racial and ethnic populations that all are a part of California. Each cycle, thousands of CHIS interviews are conducted in languages other than English.

Searching for Causes & Cures

KEN MADDY CCR

CALIFORNIA CANCER REGISTRY

CALIFORNIA DEPARTMENT OF PUBLIC HEALTH

For additional cancer data
from the
California Cancer Registry (CCR),
please visit our website:

www.ccrcal.org

UCDAVIS

INSTITUTE FOR POPULATION HEALTH IMPROVEMENT

California Department of PublicHealth