



# Center for Health Statistics



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DATA SUMMARY  
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This Data Summary is one of a series of leading cause of death reports.

## Suicide Deaths California 1998

By Cheryl Wilson

### Introduction

Suicide was the 9<sup>th</sup> leading cause of death in California and the 8<sup>th</sup> leading cause in the United States in 1998.<sup>1,2</sup>

Suicide is a complex behavior that has been related to multiple risk factors, which vary with age, gender, and race/ethnicity. Persons who commit suicide often suffer from depression, diagnosable mental, and/or substance abuse disorders.<sup>3</sup>

Firearms are most commonly used to commit suicide in the U.S. In 1998, fifty-seven percent (57%) of the total number of U.S. suicides were committed using a firearm. Suicide deaths by firearms were higher among males (61.6%) than females (38.4%). Of the California residents who died by suicide in 1998, approximately one-half used a firearm. Predominant methods used in suicide deaths by males and females differ in California. The largest proportion of male suicide deaths (55.9%) was by firearm while females (38.6%) used poisoning. Other methods used to commit suicide include strangulation, jumping, cutting and piercing.<sup>4</sup>

Due to the prevalence of suicide in this country, the U.S. Public Health Service established a health objective for *Healthy People 2000*, seeking to reduce the number of suicide deaths to an age-adjusted rate of no more than 10.5 per 100,000 people.<sup>5</sup>

This report contains data on California's suicide deaths for 1997 and 1998. The primary focus of this report is on 1998 data, providing analysis of crude and age-adjusted death rates for California residents by sex, age, and race/ethnicity.

### Highlights

- Suicide was the 9<sup>th</sup> leading cause of death in California.
- Approximately one-half of suicide deaths involved a firearm.
- 75 % of all suicide deaths occurred among White residents.
- Males account for 78% of all suicide deaths.
- White males had the highest age-specific and age-adjusted death rates.
- Year 2000 National Health Objective for suicide continues to be met by California.

<sup>1</sup>Riedmiller K., Bindra K. *Vital Statistics of California, 1998*. Center for Health Statistics, California Department of Health Services. April 2001.

<sup>2</sup>American Association of Suicidology. *U.S.A. Suicide Summary: 1998 Official Final Data*.

<sup>3</sup>National Institute of Mental Health. Suicide. *In Harm's Way: Suicide In America*. NIH Publication No. 01-4594. 1997

<sup>4</sup>Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. State Injury Mortality Data. 1998 California Suicide.

<sup>5</sup>U.S. Department of Health and Human Services. *Healthy People 2000: National Health Promotion and Disease Prevention Objectives*. Washington, D.C.: DHHS Pub. No. (PHS) 99-1256, June 1999.

## Suicide Deaths

A description of [methods](#) and a brief overview of [data limitations](#) and [qualifications](#) are provided at the end of this report.

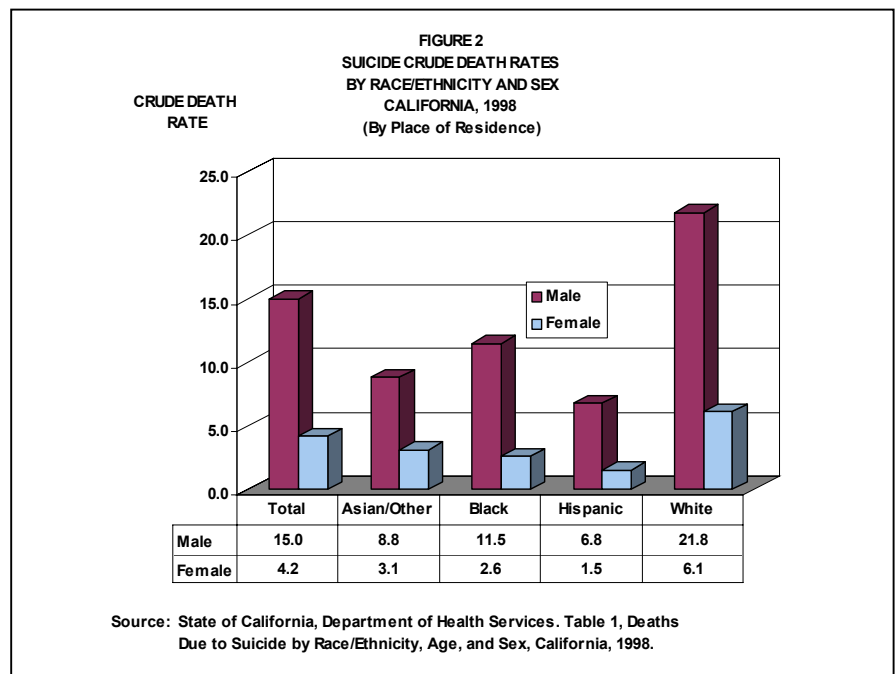
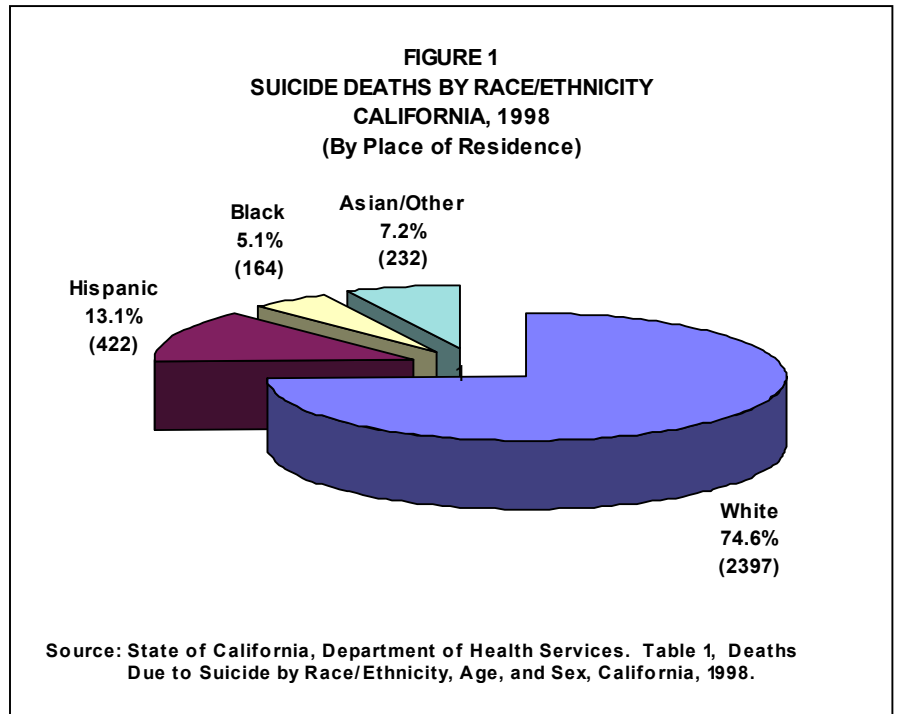
**Table 1** (page 8) shows suicide death data for California residents for 1998 by race/ethnicity, age group, and sex. Among the age groups listed, California residents age 35 to 44 had the largest number of suicide deaths (695), followed by those age 45 to 54 (557), and age 25 to 34 (535). The remaining age groups had less than 400 suicide deaths each.

In 1998, suicide deaths were higher for males than for females. Males had 78 percent of all suicide deaths, and females had 22 percent. Among each of the major race/ethnic groups, suicide deaths were higher for males than for females. White males had 1,864 or 58 percent of the total suicide deaths in California. **Figure 1** shows Whites had the largest number of suicide deaths (2,397), followed by Hispanics (422), Asian/Other (232), and Blacks (164).

## Suicide Crude Death Rates

As shown in **Table 1** (page 8), California's suicide crude death rate in 1998 was 9.6 per 100,000 population, a 7.7 percent drop from the 1997 rate of 10.4. Whites had the highest crude death rate (13.9), followed by Blacks (7.0), Asian/Other (5.9), and Hispanics (4.2). The crude rate for Whites is two times higher than the rate for Blacks and Asian/Other, and three times higher than the rate for Hispanics.

Crude death rates decreased in 1998 from the 1997 rates shown on **Table 2** (page 9) for Whites, Asian/Other, and Hispanics. The rate decreases from 1997 to 1998 were statistically significant for the White and Asian/Other race/ethnic groups.



See the [Methodological Approach](#) Section later in this report for an explanation of crude and age-specific death rates.

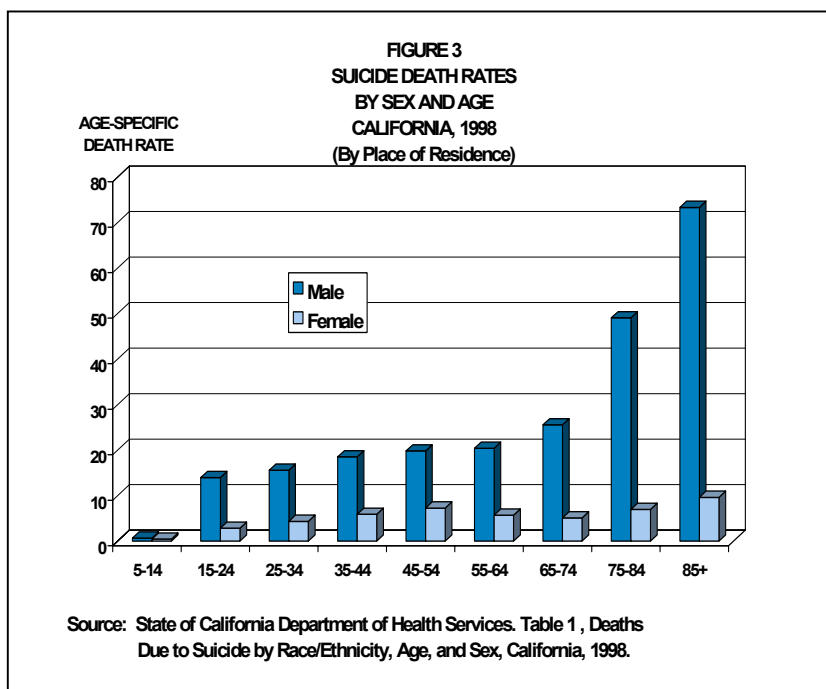
Suicide crude death rates for Blacks increased from 1997 to 1998; however, the rate of increase was not statistically significant.

**Figure 2** (page 2) shows White males had the highest suicide crude death rate at 21.8 per 100,000 population, followed by Black males (11.5). In contrast, the lowest death rates occurred among Hispanic (1.5) and Black (2.6) females. Overall, males had significantly higher crude death rates than females in their corresponding race/ethnic groups.

## Suicide Age-Specific Death Rates

As shown in **Figure 3**, the age-specific death rates for 1998 among males were significantly higher than the age-specific death rates among females. The difference in the reliable age-specific death rates among males and females ranged from a low of 0.5 deaths per 100,000 population for in the 5-14 age group, up to a high of 29.3 for decedents aged 85 and older.

The age-specific death rates among males show a direct correlation with the age of decedent; as the age of the decedent increased so did the age-specific death rate. The lowest reliable male age-specific death rate (13.9 per 100,000 population) was among males age 15-24, and the highest age-specific death rate (73.3) was among males age 85 and older. The lowest reliable age-specific death rate (2.8) among females was for the 15-24 age group, and the highest age specific rate (9.6) was among females age 85 and older.



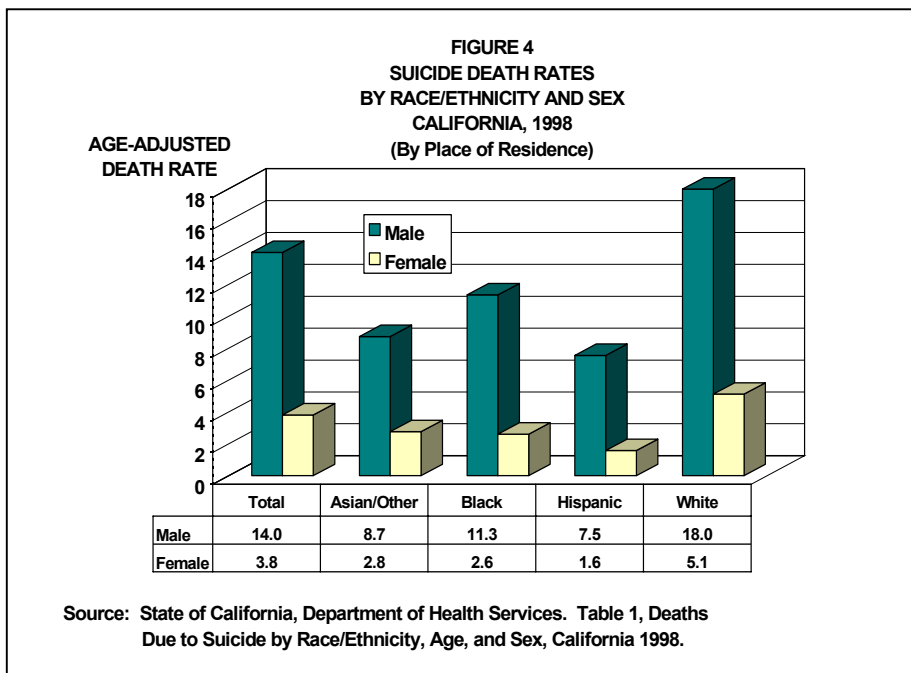
**Table 1** (page 8) shows that the highest reliable age-specific death rates varied among the age groups for each of the major race/ethnic groups. Whites had the highest rate at 34.8 per 100,000 among decedents age 85 and older, followed by Blacks age 25-34 (12.7), Asian/Other age 65-74 (11.8), and Hispanics age 15-24 (7.3). Among the lowest reliable death rates for the race/ethnic groups, Hispanics had a rate of 4.6 among decedents age 55-64, followed by Asian/Other age 35-44 (5.5), Blacks age 15-24 (7.7), and Whites age 15-24 (10.5). Age-specific suicide death rates for White males of each age group were significantly higher than the rates of the other three race/ethnic groups, except for Black males age 25-34, which exceeded White males.

## Suicide Age-Adjusted Death Rates

See the Vital Statistics Query System (VSQ) at our web site [www.dhs.ca.gov/hisp/Applications/vsq/vsq.cfm](http://www.dhs.ca.gov/hisp/Applications/vsq/vsq.cfm) to create your own vital statistics tables.

In 1998, the age-adjusted death rate of 8.8 per 100,000 population was less than the U.S. rate of 10.4. The Healthy People 2000 National Objective of 10.5 was first met in 1996 (9.8) and the declining trend continued in 1997 (9.6) and 1998.<sup>5, 6</sup>

**Figure 4** shows suicide age-adjusted death rates for 1998 among California residents by race/ethnicity and sex. During this year, the age-adjusted suicide death rate among California males was significantly greater than for females. The male rate of 14.0 was 3.7 times greater than the 3.8 rate for females.



Similar significant differences also exist between the sexes of all race/ethnic groups. The male age-adjusted death rates among Asian/Other, Blacks, Hispanics, and Whites were respectively 3.1, 4.3, 4.7, and 3.5 times greater than the age-adjusted death rates among their female counterparts. Among males, Whites had a significantly higher rate (18.0) than males of the other race/ethnic groups, followed by Black males (11.3), Asian/Other males (8.7), and Hispanic males (7.5). Similarly, White females had a significantly higher rate (5.1) than females of the other three race/ethnic groups, followed by Asian/Other females (2.8), Black females (2.6), and Hispanic females (1.6).

## Suicide Death Rates for California Counties

**Table 3** (page 10) shows a three-year average (1996-1998) of the number of suicide deaths, crude death rates, and age-adjusted death rates for California and each of the 58 counties.

Among the counties with reliable rates, the crude rate varied from a high of 20.8 per 100,000 population in Shasta County to a low of 7.1 in Tulare County, a difference in rate by a factor of more than 3 to 1. Shasta County had the highest reliable age-adjusted rate (19.2), and Tulare County had the lowest rate (7.1).

<sup>6</sup>Fujitani L. *Suicide Deaths in California, 1980-1996*. Center for Health Statistics, California Department of Health Services. 1998.

For more data, see DHS Center for Health Statistics, Home Page at [www.dhs.ca.gov/org/hisp/chs/chsindex.htm](http://www.dhs.ca.gov/org/hisp/chs/chsindex.htm).

California's age-adjusted suicide death rate for the three-year averaged period was 9.4. California as a whole and 29 counties (18 with reliable rates) met the year 2000 national health objective to reduce the age-adjusted suicide death rate to no more than 10.5 per 100,000 population.

## Suicide Deaths among the Three Local City Health Jurisdictions

**Table 4** shows the three-year average (1996-1998) number of suicide deaths and crude death rates for California's three local (city) health jurisdictions. Long Beach had the largest average number of suicide deaths (47.3), followed by Berkeley (12.3), and Pasadena (12.0). Of the crude death rates, Berkeley had the highest at 11.6, then Long Beach at 10.7, and Pasadena at 8.7. Long Beach had the only reliable crude death rate.

**TABLE 4**  
**SUICIDE DEATHS**  
**AMONG THE LOCAL CITY HEALTH JURISDICTIONS**  
**CALIFORNIA, 1996-1998**  
**(By Place of Residence)**

Local Health Jurisdiction	Number of Suicide Deaths (Average)	1997 Population	Crude Death Rate
Berkeley	12.3	106,300	11.6*
Long Beach	47.3	440,800	10.7
Pasadena	12.0	138,600	8.7*

**Note:** Rates are per 100,000 population, ICD-9 codes E950-E959.

\* Death Rate unreliable (relative standard error is greater or equal to 23%).

**Sources:** State of California, Department of Finance, Report E-4 Historical City/County Population Estimates 1991-2000, with 1990 census counts, May 2000.  
State of California, Department of Health Services, Death Records.

## Methodological Approach

The methods used to analyze vital statistics data are important. Analyzing only the number of deaths has its disadvantages and can be misleading because the population at risk is not taken into consideration. Crude death rates show the actual rate of dying in a given population, but because of the age compositions of various populations, they do not provide a statistically valid method for comparing geographic areas or multiple reporting periods. Age-specific death rates are the number of deaths per 100,000 population in a specific age group and are used along with standard population proportions to develop a weighted average rate. This rate is referred to as an age-adjusted death rate and removes the effect of different age structures of the populations whose rates are being compared. Age-adjusted death rates, therefore, provide the preferred method for comparisons of different race/ethnic groups, sexes, and geographic areas, and for measuring death rates over time. The 1940 United States (standard million) population is used as the basis for age-adjustment in this report.

## Data Limitations and Qualifications

You can read more about crude and age-adjusted death rates on the National Center for Health Statistics web site at [www.cdc.gov/nchs](http://www.cdc.gov/nchs).

This suicide death data presented in this report are based on the vital statistics records with ICD-9 codes E950-E959 as defined by the National Center for Health Statistics.<sup>7, 8</sup>

The term “significant” within the text indicates either statistically significant based on the slope of a least squared line not equal to zero ( $p < .05$ ) for regression analysis, or statistically significant based on the difference between two independent rates ( $p < .05$ ).

As with any vital statistics data, caution needs to be exercised when analyzing small numbers, including the rates derived from them. Death rates calculated from a small number of deaths and/or population tend to be unreliable and subject to significant variation from one year to the next. To assist the reader, 95 percent confidence intervals are provided in the data tables as a tool for measuring the reliability of death rates. Rates with a relative standard error (coefficient of variation) greater than or equal to 23 percent are indicated with an asterisk (\*). Also, three-year averages were used in Table 3 to increase the reliability of the rates by county.

In addition, the population data used to calculate the crude rates in Table 4 differ from the population data used to calculate the crude rates in Table 3. Consequently, caution should be exercised when comparing the crude rates among the three local health jurisdictions with the rates among the 58 California counties.

The 1940 United States population (standard million) is utilized in this report for age-adjustments because it corresponds to prior statistical reports produced on suicide by the California Department of Health Services, Center for Health Statistics and the U.S. Department of Health and Human Services, National Center for Health Statistics, and Office of Disease Prevention and Health Promotion (Healthy People 2000).

The four race/ethnic groups presented in Tables 1 and 2 are mutually exclusive. White, Black, and Asian/Other exclude Hispanic ethnicity, while Hispanic includes any race/ethnic group. In order to remain consistent with the population data obtained from the Department of Finance, the “White race/ethnic group” includes: White, Other (specified), Not Stated, and Unknown, and “Asian/Other race/ethnic group” includes: Aleut, American Indian, Asian Indian, Asian (specified/unspecified), Cambodian, Chinese, Eskimo, Filipino, Guamanian, Hawaiian, Japanese, Korean, Laotian, Other Pacific Islander, Samoan, Thai, and Vietnamese. In addition, caution should be exercised in the interpretation of mortality data by race/ethnicity. Misclassification of race/ethnicity on the death certificate may contribute to death rates that may be underestimated among Hispanics and Asian/Other.<sup>9</sup>

<sup>7</sup>National Center for Health Statistics. *Vital Statistics, Instructions for Classifying the Underlying Cause of Death*. NCHS Instruction Manual, Part 2a. Hyattsville, Maryland: Public Health Service. 1998.

<sup>8</sup>National Center for Health Statistics, Deaths: Final Data for 1998. *National Vital Statistics Report*, DHHS Pub. No. (PHS) 2000-1120, 0-0487, Vol.48, No. 11, p 5. July 2000.

<sup>9</sup>Hahn RA, Mulinare J, Teutsch SM. *Inconsistencies in Coding Race and Ethnicity between Birth and Death in U.S. Infants*. The Journal of the American Medical Association, Vol. 267, No. 2. January 1992.

[Reports from prior periods](#) are available on this subject.

For a more complete explanation of the age-adjusting methodology included in this report, see the *Healthy People 2000 Statistical Notes* publication.<sup>10</sup> Detailed information on data quality and limitations are presented in the appendix of the annual report, *Vital Statistics of California*.<sup>11</sup> Formulas for death rates are provided in the *County Health Status Profiles* Report.<sup>11</sup>

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<sup>10</sup>Curtin LR, Klein RJ. Direct Standardization (Age-Adjusted Death Rates), *Healthy People 2000 Statistical Notes*. National Center for Health Statistics DHHS Pub. No. (PHS) 95-1237, March 1995: No. 6-Revised.

<sup>11</sup>Fujitani L. *County Health Status Profiles 2000*. Center for Health Statistics, California Department of Health Services, April 2000.

TABLE 1  
DEATHS DUE TO SUICIDE BY RACE/ETHNICITY, AGE, AND SEX  
CALIFORNIA, 1998  
(By Place of Residence)

Table with columns for AGE GROUPS, DEATHS (TOTAL, MALE, FEMALE), POPULATION (TOTAL, MALE, FEMALE), RATES (TOTAL, MALE, FEMALE), and 95% CONFIDENCE LIMITS (TOTAL, MALE, FEMALE). Rows are categorized by race/ethnicity: TOTAL, ASIAN/OTHER, BLACK, HISPANIC, and WHITE, with sub-rows for various age groups (UNDER 1 to 85 & OLDER) and an AGE-ADJUSTED row.

Note: Rates are per 100,000 population; ICD-9 Codes E950-E959.  
White, Black, and Asian/Other exclude Hispanic ethnicity.

\* Death rate unreliable, relative standard error is greater than or equal to 23%.  
+ Standard error indeterminate, death rate based on no (zero) deaths.  
- Confidence limit is not calculated for no (zero) deaths.

Source: State of California, Department of Finance, 1998 Population Projections by Age, Sex and Race/Ethnic Groups, May, 2000.  
State of California, Department of Health Services, Death Records.





**TABLE 3**  
**DEATHS DUE TO SUICIDE**  
**CALIFORNIA COUNTIES, 1996-1998**  
**(By Place of Residence)**

COUNTY	1996-1998 DEATHS (AVERAGE)	PERCENT	1997 POPULATION	CRUDE RATE	AGE-ADJUSTED RATE	95% CONFIDENCE LIMITS	
						LOWER	UPPER
<b>CALIFORNIA</b>	<b>3,349.0</b>	<b>100.0</b>	<b>32,956,695</b>	<b>10.2</b>	<b>9.4</b>	<b>9.1</b>	<b>9.8</b>
ALAMEDA	130.7	3.9	1,398,421	9.3	8.3	6.8	9.8
ALPINE	0.3	a	1,174	28.4 *	22.0 *	0.0	96.7
AMADOR	5.3	0.2	33,472	15.9 *	12.6 *	0.4	24.8
BUTTE	34.7	1.0	198,459	17.5	14.9	9.4	20.3
CALAVERAS	8.7	0.3	37,916	22.9 *	18.4 *	4.9	31.8
COLUSA	2.3	0.1	18,530	12.6 *	8.9 *	0.0	21.7
CONTRA COSTA	89.0	2.7	896,206	9.9	8.8	6.8	10.7
DEL NORTE	3.3	0.1	28,413	11.7 *	9.1 *	0.0	19.7
EL DORADO	27.3	0.8	147,409	18.5	16.2	9.7	22.6
FRESNO	71.3	2.1	778,674	9.2	9.2	7.0	11.4
GLENN	3.0	0.1	26,856	11.2 *	12.0 *	0.0	26.2
HUMBOLDT	22.3	0.7	126,137	17.7	15.7	8.9	22.5
IMPERIAL	8.0	0.2	142,759	5.6 *	5.5 *	1.6	9.3
INYO	3.3	0.1	18,272	18.2 *	15.0 *	0.0	32.0
KERN	65.0	1.9	634,404	10.2	10.3	7.7	12.8
KINGS	9.0	0.3	117,793	7.6 *	7.7 *	2.6	12.9
LAKE	13.7	0.4	55,047	24.8 *	21.0 *	8.4	33.6
LASSEN	4.3	0.1	33,861	12.8 *	12.1 *	0.6	23.6
LOS ANGELES	814.3	24.3	9,524,613	8.5	8.2	7.7	8.8
MADERA	9.0	0.3	113,525	7.9 *	7.8 *	2.6	13.0
MARIN	32.7	1.0	243,214	13.4	10.0	6.2	13.7
MARIPOSA	3.3	0.1	15,957	20.9 *	12.9 *	0.0	27.9
MENDOCINO	18.0	0.5	85,966	20.9 *	17.7 *	9.0	26.5
MERCED	15.7	0.5	201,905	7.8 *	7.9 *	3.9	11.8
MODOC	1.3	a	10,140	13.1 *	17.2 *	0.0	47.7
MONO	1.3	a	10,531	12.7 *	9.7 *	0.0	27.1
MONTEREY	39.0	1.2	377,744	10.3	10.0	6.8	13.3
NAPA	14.7	0.4	121,239	12.1 *	9.9 *	4.3	15.4
NEVADA	13.7	0.4	88,356	15.5 *	12.4 *	4.9	19.8
ORANGE	227.3	6.8	2,705,313	8.4	7.9	6.8	9.0
PLACER	29.0	0.9	215,634	13.4	12.1	7.5	16.8
PLUMAS	3.7	0.1	20,402	18.0 *	14.6 *	0.0	30.6
RIVERSIDE	164.7	4.9	1,423,699	11.6	10.8	9.1	12.6
SACRAMENTO	142.3	4.3	1,146,825	12.4	11.3	9.4	13.3
SAN BENITO	3.0	0.1	46,121	6.5 *	6.4 *	0.0	13.9
SAN BERNARDINO	159.3	4.8	1,617,262	9.9	9.8	8.2	11.3
SAN DIEGO	328.7	9.8	2,763,401	11.9	11.1	9.9	12.4
SAN FRANCISCO	110.0	3.3	777,368	14.2	11.3	9.0	13.6
SAN JOAQUIN	55.3	1.7	542,196	10.2	9.7	7.0	12.3
SAN LUIS OBISPO	30.3	0.9	234,813	12.9	11.3	7.0	15.5
SAN MATEO	72.7	2.2	711,699	10.2	9.1	6.9	11.4
SANTA BARBARA	46.3	1.4	400,751	11.6	10.0	7.0	13.0
SANTA CLARA	134.0	4.0	1,671,414	8.0	7.5	6.2	8.8
SANTA CRUZ	27.3	0.8	247,216	11.1	10.0	6.0	14.0
SHASTA	34.0	1.0	163,351	20.8	19.2	12.3	26.0
SIERRA	1.0	a	3,406	29.4 *	24.0 *	0.0	71.2
SISKIYOU	9.0	0.3	44,186	20.4 *	17.7 *	5.2	30.2
SOLANO	41.7	1.2	378,664	11.0	10.5	7.2	13.8
SONOMA	60.7	1.8	432,771	14.0	12.6	9.2	16.0
STANISLAUS	43.7	1.3	425,407	10.3	9.7	6.7	12.7
SUTTER	11.3	0.3	76,004	14.9 *	14.1 *	5.6	22.6
TEHAMA	7.0	0.2	54,702	12.8 *	10.6 *	1.8	19.4
TRINITY	2.7	0.1	13,230	20.2 *	9.1 *	0.0	22.3
TULARE	25.3	0.8	358,337	7.1	7.1	4.3	10.0
TUOLUMNE	7.3	0.2	52,280	14.0 *	9.9 *	1.8	18.1
VENTURA	79.3	2.4	727,154	10.9	9.8	7.6	12.1
YOLO	17.7	0.5	154,850	11.4 *	10.9 *	5.7	16.1
YUBA	9.7	0.3	61,246	15.8 *	14.6 *	5.0	24.2

Note: Rates are per 100,000 population; ICD-9 Codes E950-E959. Death rate unreliable (relative standard error is greater than or equal to 23%).  
a Represents a percentage of more than zero but less than 0.05.

Source: State of California, Department of Finance, Race/Ethnic Population Estimates by County with Age and Sex Detail, 1970-1998, May 2000.  
State of California, Department of Health Services, Death Records.