



# 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.

## Highlights

- In 2003, the number of chronic liver disease and cirrhosis deaths among males was much higher than among females.
- During 2003, the California chronic liver disease and cirrhosis age-adjusted death rate of 11.3 deaths per 100,000 population was higher than the United States rate of 9.2.
- In 2003, American Indians had a higher age-adjusted death rate than the corresponding rate for Hispanics, Whites, Blacks and Asians.

# Chronic Liver Disease and Cirrhosis Deaths in California, 2000-2003

By Daniel H. Cox

## Introduction

Chronic liver disease and cirrhosis has been historically one of the leading causes of death in the United States and in California. There are many risk factors for chronic liver disease and cirrhosis such as excessive alcohol consumption, chronic viral hepatitis, congenital and inherited diseases, and prolonged exposure to environmental toxins, but the primary risk factor is excessive alcohol consumption. Currently, nearly 14 million Americans abuse alcohol or are alcoholic.<sup>1</sup> In 2003 there were 27,201 chronic liver disease and cirrhosis deaths in the United States; 3,832 of those deaths occurred in California.<sup>2</sup>

This report presents data on chronic liver disease and cirrhosis deaths from 2000 to 2003 with the focus on 2003. It provides analysis of crude and age-adjusted death rates for California residents by sex, age, race/ethnicity, and county. The definition of chronic liver disease and cirrhosis used in this report is based on the International Classification of Diseases, Tenth Revision (ICD-10) codes K70, K73, and K74 presented in National Center for Health Statistics (NCHS) reports.<sup>3</sup>

## Chronic Liver Disease and Cirrhosis Deaths

**Table 1** (page 9) displays chronic liver disease and cirrhosis death data for 2003 by race/ethnicity, age, and sex. During this period, the number of deaths attributed to chronic liver disease and cirrhosis was much higher among males (2,537) than among females (1,295). As shown in **Figure 1** (page 2), the number of chronic liver disease and cirrhosis deaths among Whites (2,199) was higher than Hispanics (1,215), Blacks (210), Asians (127), and American Indians (60).

<sup>1</sup> National Institute on Alcohol Abuse and Alcoholism. Alcoholism, Getting the Facts, NIH Publication Number 96-4153, Revised 2001.

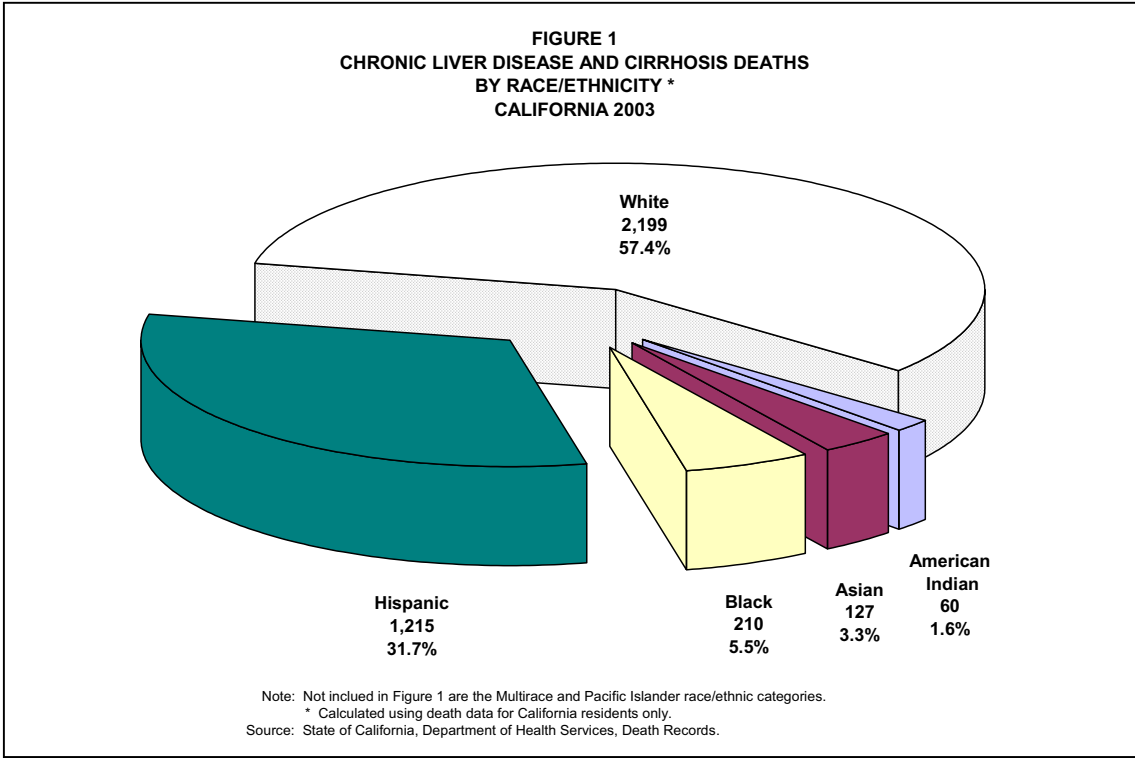
<sup>2</sup> National Center for Health Statistics. Deaths: Preliminary Data for 2003. National Vital Statistics Reports; DHHS Publication Number (PHS) 2005-1120, PRS 05-0162, Vol. 53, No. 15, February 2005.

<sup>3</sup> National Center for Health Statistics. Deaths: Preliminary Data for 1999. National Vital Statistics Reports DHHS Publication Number (PHS) 2001-1120, PRS 01-0358, Volume 49, Number 3, June 2001.

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

**Tables 2** (page 10), **3** (page 11), and **4** (page 12) display chronic liver disease and cirrhosis death data for 2002, 2001, and 2000, respectively. These tables show the same pattern of higher death numbers among males than among females and higher death numbers among Whites than among the other four race/ethnic groups.

Chronic liver disease and cirrhosis deaths occur almost exclusively among the adult population, and this held true in 2003 with the first deaths occurring in the 25 to 34 age group and continuing through all the older age groups (**Table 1** page 9). This pattern of chronic liver disease and cirrhosis deaths among adult Californians was similar for the three earlier years covered in this report.

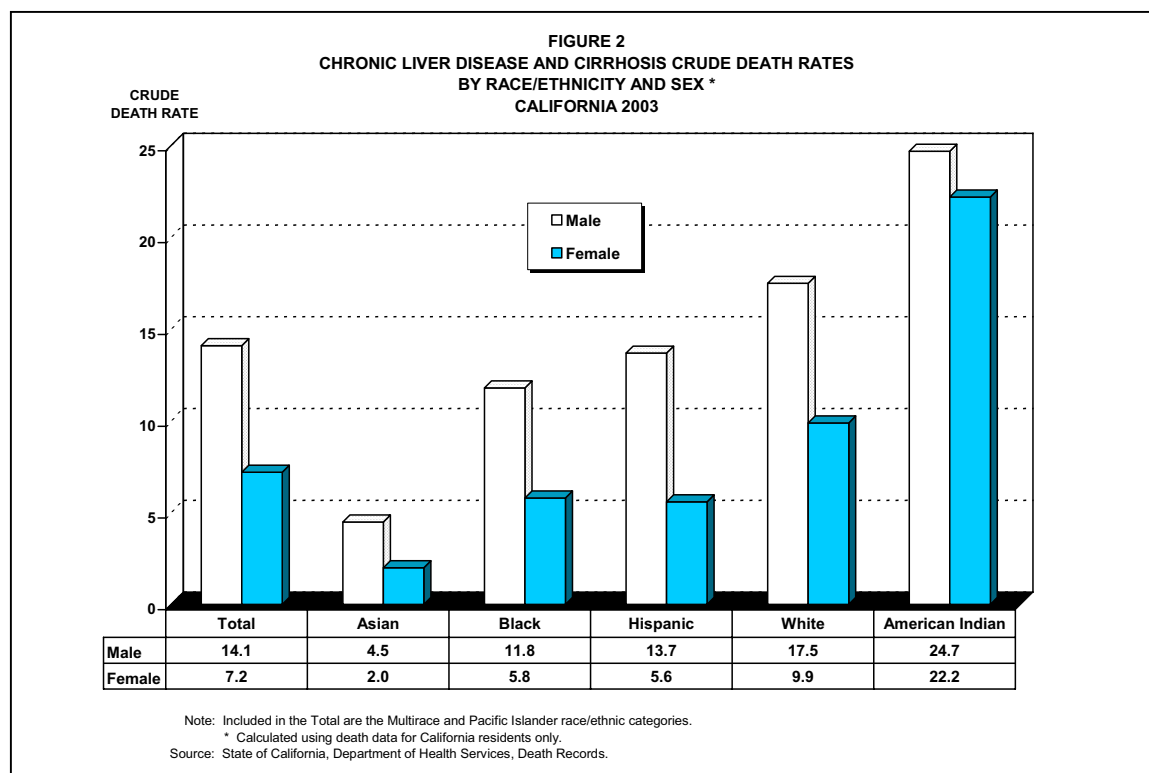


### Chronic Liver Disease and Cirrhosis Crude Death Rates

The chronic liver disease and cirrhosis crude death rate for California decreased from 10.8 deaths per 100,000 population in 2000 to 10.7 deaths in 2003, though this decrease from 2000 to 2003 was not statistically significant. As shown in **Table 1** (page 9), American Indians had the highest crude death rate in 2003, a rate of 23.4. Whites were next with a crude rate of 13.7, followed by Hispanics with a crude rate of 9.8, Blacks with a crude rate of 8.8, and Asians with a crude rate of 3.2. In a statistical comparison with year 2000 (**Table 4**, page 12), American Indians had a chronic liver disease and cirrhosis crude death rate of 21.8 and Whites had a rate of 13.5, both of which were lower than their respective rates for 2003. In 2000 Hispanics had a crude rate of 10.1 and Blacks had a crude rate of 9.6; both of these rates were higher than their companion rates for 2003. None of these differences were statistically significant. The 2000 chronic liver disease and cirrhosis crude death rate for Asians, a rate of 3.2, was the same as the rate for 2003.

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

**Figure 2** shows males in all five race/ethnic groups had higher chronic liver disease and cirrhosis crude death rates than females in the corresponding race/ethnic groups for the year 2003. American Indian males had a rate of 24.7 deaths per 100,000 population, and American Indian females had a rate of 22.2. White males had a rate of 17.5 and White females had a rate of 9.9. Hispanic males had a rate of 13.7 and Hispanic females had a rate of 5.6. Black males had a rate of 11.8 and Black females had a rate of 5.8. Asian males had a rate of 4.5 and Asian females had a rate of 2.0. The differences between males and females in the various race/ethnic groups and overall were statistically significant except for the difference among American Indian males and females.



## Chronic Liver Disease and Cirrhosis Age-Specific Death Rates

**Table 1** (page 9) shows that among reliable rates in 2003, in the 25 to 34 age group Hispanics (1.9) had a higher chronic liver disease and cirrhosis age-specific death rate than Whites (1.6). In the 35 to 44 age group Hispanics again had the highest rate (10.6) while Whites (9.3) and Blacks (6.0) had lower rates. In the 45 to 54 age group American Indians (61.3) had the highest death rate while Hispanics (31.1), Blacks (23.8), Whites (23.2), and Asians (4.7) had lower rates. This was the only age group where American Indians had a reliable age-specific death rate. In the 55 to 64 age group Hispanics (44.7) had the highest death rate while Blacks (28.4), Whites (27.4), and Asians (6.7) had lower rates. The pattern was similar in the 65 to 74 age group where Hispanics (62.7) again had the highest death rate while Blacks (34.0), Whites (33.2), and Asians (11.4) had lower rates. In the 75 to 84 age group Hispanics (63.3) had the highest death rate while Whites (29.2) and Asians (19.1) had lower rates. In the 85 and Older age group only Whites (18.5) had a reliable chronic liver disease and cirrhosis age-specific death rate.

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.

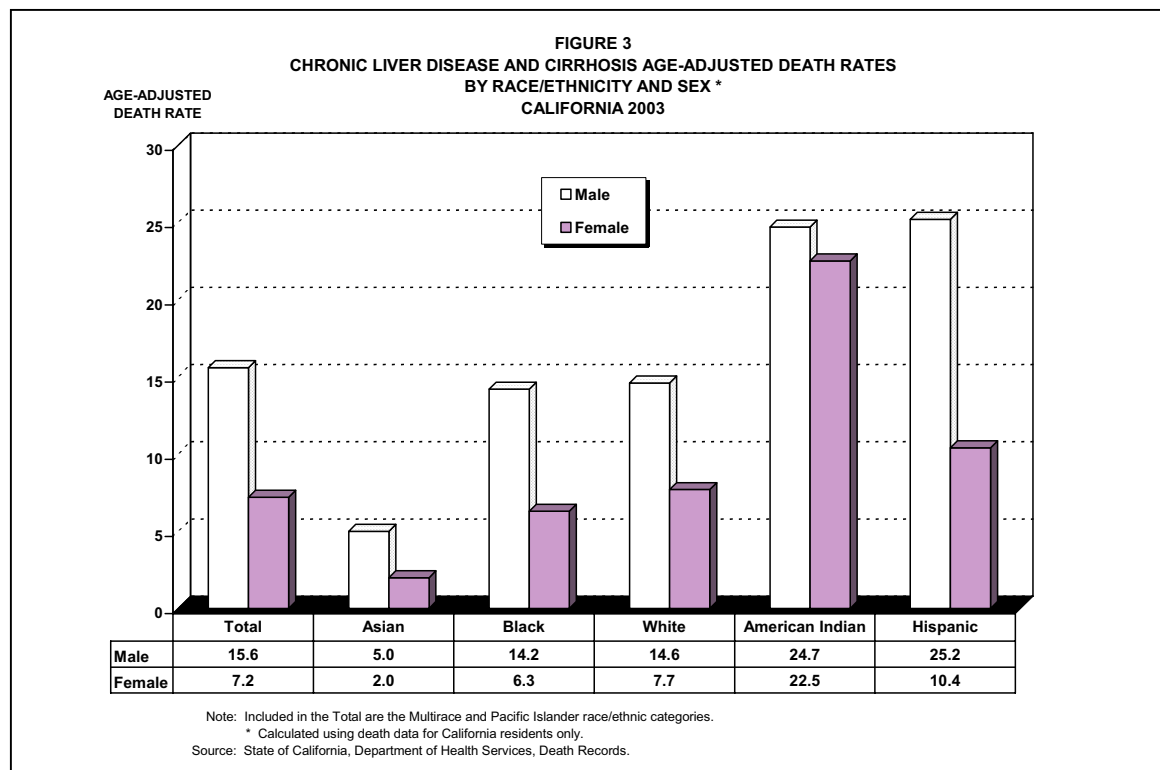
The years 2000, 2001, and 2002 showed similar patterns of chronic liver disease and cirrhosis age-specific death rates among the five race/ethnic groups displayed in this report.

## Chronic Liver Disease and Cirrhosis Age-Adjusted Death Rates

In 2003 the California chronic liver disease and cirrhosis age-adjusted death rate of 11.3 deaths per 100,000 population was higher than the United States rate of 9.2.<sup>2</sup> During this period, California did not meet the *Healthy People 2010* objective of no more than 3.0 chronic liver disease and cirrhosis age-adjusted deaths per 100,000 population.<sup>4</sup> The California rate did decrease significantly from 2000 when the rate was 11.9.

Displayed in **Table 1** (page 9), a comparison among the five race/ethnic groups shows that in 2003 American Indians had a chronic liver disease and cirrhosis age-adjusted death rate of 23.7, which was higher than the Hispanic rate of 17.5, the White rate of 11.0, the Black rate of 9.9, and the Asian rate of 3.4. Displayed in **Table 2** (page 10), **Table 3** (page 11), and **Table 4** (page 12) the years 2002, 2001, and 2000 show the same pattern of higher chronic liver disease and cirrhosis age-adjusted death rates for American Indians compared with the other four race/ethnic groups.

As shown in **Figure 3**, in 2003 the chronic liver disease and cirrhosis age-adjusted death rate for males was higher than for females in all five race/ethnic groups. All of these gender differences were statistically significant except for the difference between American Indian males and females.



<sup>4</sup> U.S. Department of Health and Human Services. *Healthy People 2010 Volume II*. Washington DC: U.S. Government Printing Office, November 2000.

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

**Figure 3** (page 4) also shows that of the 2003 chronic liver disease and cirrhosis age-adjusted death rates among males, Hispanics had the highest rate and American Indians, Whites, Blacks, and Asians had lower rates. Among females, American Indians had significantly higher death rates than females in the other four race/ethnic groups.

### Chronic Liver Disease and Cirrhosis Death Data for California Counties

**Table 5** (page 13) displays the average number of deaths, crude death rates, and age-adjusted death rates by county for a three-year period, 2001 to 2003. This averaging is done to reduce the large fluctuations in the death rates that are inherent among counties with a small number of events and/or population.

The highest average number of chronic liver disease and cirrhosis deaths occurred in Los Angeles County (1,049.7) and the lowest in Alpine County (0.3).

The highest reliable chronic liver disease and cirrhosis crude death rate was shared by both Butte and Humboldt Counties (17.6 deaths per 100,000 population) and the lowest reliable crude death rate occurred in Santa Clara County (8.0).

The ranking for age-adjusted death rates showed Imperial County with the highest reliable rate (19.2) and Marin County with the lowest reliable rate (8.4).

TABLE 6  
CHRONIC LIVER DISEASE AND CIRRHOSIS DEATHS  
AMONG THE CITY HEALTH JURISDICTIONS\*  
CALIFORNIA, 2001-2003

CITY HEALTH JURISDICTION	NUMBER OF DEATHS (Average)	2002 POPULATION	CRUDE DEATH RATE
BERKELEY	8.7	104,200	8.3 +
LONG BEACH	52.0	473,100	11.0
PASADENA	16.0	138,800	11.5 +

Note: Rates are per 100,000 population. Data is ICD-10 codes K70, K73, K74.

\* Calculated using death data for California residents only.

+ Death rate unreliable, relative standard error is greater than or equal to 23 percent.

Source: State of California, Department of Finance, E-4 Population Estimates for Cities, Counties and the State, 2001-2004, with 2000 DRU Benchmark, May 2004.  
State of California, Department of Health Services, Death records.

### Chronic Liver Disease and Cirrhosis Death Data by City Health Jurisdiction

**Table 6** displays the average number of deaths and crude death rates for California's three city health jurisdictions for a three-year period, 2001 to 2003. Age-adjusted death

For more data, see Department of Health Services (DHS) Center for Health Statistics, Home Page at <http://www.dhs.ca.gov/ohir>

rates were not calculated for the city health jurisdictions because city population estimates by age were not available.

The city of Long Beach had an annual average of 52.0 chronic liver disease and cirrhosis deaths for the three-year period, Pasadena had 16.0, and Berkeley had 8.7.

Pasadena had a chronic liver disease and cirrhosis crude death rate of 11.5 deaths per 100,000 population, Long Beach had a crude rate of 11.0, and Berkeley had a crude rate of 8.3. The rates for Pasadena and Berkeley were not reliable.

## 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 differing age compositions of various populations, crude rates do not provide a statistically valid method for comparing geographic areas, sexes, race/ethnic groups, and/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 comparing different race/ethnic groups, sexes, and geographic areas and for measuring death rates over time. The year 2000 population standard is used as the basis for age-adjustments in this report.

## Data Limitations and Qualifications

The chronic liver disease and cirrhosis death data presented in this report are based on vital statistics records with ICD-10 codes K70, K73 and K74 as defined by the NCHS.<sup>3</sup> Deaths by place of residence means that the data include only those deaths occurring among residents of California and its counties, regardless of the place of death.

The term “significant” within the text indicates 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 the death rates. Rates with a relative standard error (coefficient of variation) greater than or equal to 23 percent are indicated with an asterisk (\*).

Beginning in 1999, cause of death is reported using ICD-10.<sup>5</sup> Cause of death for 1979 through 1998 was coded using the International Classification of Diseases, Ninth Revision (ICD-9). Depending on the specific cause of death, the number of deaths and

<sup>5</sup> World Health Organization. International Statistical Classification of Diseases and Related Health Problems. Tenth Revision. Geneva: World Health Organization. 1992.

death rate are not comparable between ICD-9 and ICD-10. Therefore, our analyses do not combine both ICD-9 and ICD-10 data.

The five race/ethnic groups presented in the tables are mutually exclusive. White, Black, Asian, and American Indian exclude Hispanic ethnicity, while Hispanic includes any race/ethnic group. This is also true of the other two race/ethnic groups: 2 or More Races and Pacific Islander. These two groups are represented only in the totals of this report because their small numbers of events produced unreliable rates. 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; the “Pacific Islander race/ethnic group” includes: Guamanian, Hawaiian, Samoan, and Other Pacific Islander; the “Asian race/ethnic group” includes: Asian Indian, Asian (specified/unspecified), Cambodian, Chinese, Filipino, Hmong, Japanese, Korean, Laotian, Thai, and Vietnamese; the “American Indian race/ethnic group” includes: Aleut, American Indian, and Eskimo. 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 Pacific Islanders, Hispanics, Asians, and American Indians.<sup>6</sup>

Beginning in 2000, federal race/ethnicity reporting guidelines changed to allow the reporting of up to three races on an individual death certificate. California initiated use of the new Federal guidelines on January 1, 2000. Some earlier reports displaying data from 2000 and later were tabulated based on the first listed race on those certificates where more than one race was listed. Recently, California population estimates that include a “2 or More Races” category became available. To be consistent with the population categories, current reports tabulate race of decedent using all races mentioned on the death certificates. Therefore earlier reports are not compatible with current reports.

Effective with 1999 mortality data, the standard population for calculating age adjustments was changed from the 1940 population standard to the year 2000 population standard, in accordance with new statistical policy implemented by the NCHS. The new population standard affects measurement of mortality trends and group comparisons. Of particular note are the effects on race comparison of mortality.<sup>7</sup> Age-adjusted rates presented in this report are not comparable to rates calculated with different population standards.

In addition, the population data used to calculate the crude rates in **Table 6** (page 5) differ from the population data used to calculate the crude rates in **Table 5** (page 13). Consequently, caution should be exercised when comparing the crude rates among the three city health jurisdictions with the rates among the 58 California counties. Age-adjusted rates for city health jurisdictions were not calculated.

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<sup>6</sup> Rosenberg HM, et al. Quality of Death Rates by Race and Hispanic Origin: A Summary of Current Research, 1999. Vital and Health Statistics, Series 2, No.128, National Center for Health Statistics, DHHS Pub. No. (PHS) 99-1328. September 1999.

<sup>7</sup> Anderson RN, Rosenberg HM. Age Standardization of Death Rates: Implementation of the Year 2000 Standard. National Vital Statistics Reports; Volume 47, No. 3, Hyattsville, Maryland: National Center for Health Statistics. October 1998.

For a more complete explanation of the age-adjusting methodology used in this report, see the “Healthy People 2010 Statistical Notes” publication.<sup>8</sup> Detailed information on data quality and limitations are presented in the appendix of the annual report, “Vital Statistics of California.”<sup>9</sup> Formulas used to calculate death rates are included in the technical notes of the “County Health Status Profiles” report.<sup>10</sup>

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<sup>8</sup> Klein RJ, Schoenborn CA. Healthy People 2010 Statistical Notes: Age Adjustment using the 2000 Projected U.S. Population. National Center for Health Statistics, DHHS Publication, No. 20. January 2001.

<sup>9</sup> Ficenec S, Bindra K. Vital Statistics of California, 2002. Center for Health Statistics, California Department of Health Services. August 2004.

<sup>10</sup> Shippen S, Wilson C. County Health Status Profiles 2005. Center for Health Statistics, California Department of Health Services. April 2005.











TABLE 5  
CHRONIC LIVER DISEASE AND CIRRHOSIS DEATHS  
CALIFORNIA, 2001-2003  
(By Place of Residence)

COUNTY	2001-2003 DEATHS (Average)	PERCENT	2002 POPULATION	CRUDE RATE	AGE-ADJUSTED RATE	95% CONFIDENCE LIMITS	
						LOWER	UPPER
CALIFORNIA	3,772.0	100.0	35,338,807	10.7	11.4	11.1	11.8
ALAMEDA	138.0	3.7	1,488,074	9.3	9.9	8.2	11.5
ALPINE	0.3	0.0 a	1,292	25.8 *	21.1 *	0.0	92.6
AMADOR	5.3	0.1	36,637	14.6 *	10.9 *	1.6	20.1
BUTTE	37.0	1.0	209,770	17.6	16.7	11.3	22.2
CALAVERAS	5.0	0.1	42,524	11.8 *	8.9 *	0.8	17.0
COLUSA	3.0	0.1	19,635	15.3 *	17.0 *	0.0	36.2
CONTRA COSTA	95.3	2.5	989,807	9.6	9.6	7.6	11.5
DEL NORTE	5.3	0.1	27,982	19.1 *	18.1 *	2.7	33.5
EL DORADO	17.3	0.5	165,463	10.5 *	9.2 *	4.8	13.6
FRESNO	111.0	2.9	836,207	13.3	15.7	12.8	18.7
GLENN	2.7	0.1	26,969	9.9 *	10.6 *	0.0	23.4
HUMBOLDT	22.7	0.6	128,492	17.6	16.6	9.7	23.5
IMPERIAL	24.3	0.6	149,360	16.3	19.2	11.5	26.8
INYO	5.7	0.2	18,456	30.7 *	26.6 *	3.5	49.7
KERN	111.0	2.9	697,856	15.9	18.4	14.9	21.8
KINGS	15.3	0.4	135,123	11.3 *	15.1 *	7.4	22.7
LAKE	16.7	0.4	61,352	27.2 *	22.3 *	11.3	33.3
LASSEN	3.3	0.1	34,129	9.8 *	10.9 *	0.0	22.7
LOS ANGELES	1,049.7	27.8	9,889,170	10.6	11.7	11.0	12.4
MADERA	16.7	0.4	129,585	12.9 *	14.0 *	7.3	20.7
MARIN	26.0	0.7	250,179	10.4	8.4	5.2	11.7
MARIPOSA	3.7	0.1	17,589	20.8 *	16.0 *	0.0	32.9
MENDOCINO	11.7	0.3	88,353	13.2 *	12.2 *	5.1	19.3
MERCED	26.3	0.7	223,904	11.8	14.6	9.0	20.2
MODOC	2.0	0.1	9,400	21.3 *	18.4 *	0.0	45.1
MONO	1.0	0.0 a	13,441	7.4 *	6.1 *	0.0	18.2
MONTEREY	34.7	0.9	413,819	8.4	9.6	6.4	12.8
NAPA	19.7	0.5	128,966	15.2	13.2	7.4	19.1
NEVADA	15.3	0.4	96,045	16.0 *	12.6 *	6.2	19.0
ORANGE	252.3	6.7	2,959,646	8.5	9.4	8.3	10.6
PLACER	29.3	0.8	273,338	10.7	9.6	6.1	13.1
PLUMAS	3.0	0.1	21,117	14.2 *	11.8 *	0.0	25.8
RIVERSIDE	184.3	4.9	1,682,408	11.0	11.6	9.9	13.2
SACRAMENTO	134.0	3.6	1,302,647	10.3	11.0	9.1	12.9
SAN BENITO	6.7	0.2	55,955	11.9 *	14.5 *	3.3	25.8
SAN BERNARDINO	213.3	5.7	1,816,398	11.7	14.6	12.6	16.6
SAN DIEGO	291.0	7.7	2,944,585	9.9	10.8	9.6	12.0
SAN FRANCISCO	80.0	2.1	788,292	10.1	9.6	7.5	11.7
SAN JOAQUIN	76.0	2.0	607,896	12.5	14.3	11.0	17.5
SAN LUIS OBISPO	28.7	0.8	255,449	11.2	10.2	6.4	13.9
SAN MATEO	64.3	1.7	711,793	9.0	8.5	6.5	10.6
SANTA BARBARA	37.3	1.0	408,471	9.1	9.6	6.5	12.7
SANTA CLARA	138.0	3.7	1,717,059	8.0	8.7	7.2	10.1
SANTA CRUZ	28.0	0.7	259,164	10.8	11.1	6.9	15.3
SHASTA	26.3	0.7	172,130	15.3	14.0	8.6	19.5
SIERRA	0.7	0.0 a	3,524	18.9 *	17.2 *	0.0	60.3
SISKIYOU	7.7	0.2	44,628	17.2 *	13.1 *	3.6	22.6
SOLANO	48.7	1.3	411,498	11.8	12.4	8.9	15.9
SONOMA	53.7	1.4	470,723	11.4	10.6	7.7	13.5
STANISLAUS	62.3	1.7	477,919	13.0	14.9	11.2	18.6
SUTTER	8.0	0.2	82,696	9.7 *	9.8 *	3.0	16.7
TEHAMA	10.0	0.3	57,649	17.3 *	15.8 *	5.8	25.7
TRINITY	3.0	0.1	13,271	22.6 *	15.6 *	0.0	33.3
TULARE	51.3	1.4	383,164	13.4	16.5	12.0	21.0
TUOLUMNE	8.3	0.2	56,545	14.7 *	11.6 *	3.6	19.6
VENTURA	72.0	1.9	788,282	9.1	9.4	7.2	11.6
YOLO	17.7	0.5	180,193	9.8 *	11.9 *	6.3	17.5
YUBA	10.0	0.3	62,788	15.9 *	17.6 *	6.7	28.6

Note : Rates are per 100,000 population. ICD-10 codes K70, K73, K74.

a Represents a percentage of more than zero but less than 0.05.

\* Death rate unreliable, relative standard error is greater than or equal to 23 percent.

Source : State of California, Department of Finance; 2002 Population: Population Projections by Age, Race/Ethnicity and Sex, May 2004.

State of California, Department of Health Services, Death Records.