



April 2004

DATA SUMMARY No. DS04-04000

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

Highlights

- The chronic liver disease and cirrhosis crude death rate for California was 10.4 deaths per 100,000 population in 2002.
During 2002, the California chronic liver disease and cirrhosis age-adjusted death rate (11.1) was higher than the U.S. rate (9.3).
In 2002, Hispanics had a chronic liver disease and cirrhosis age-adjusted death rate significantly higher than Blacks, Whites, and Asian/Other.

Chronic Liver Disease and Cirrhosis Deaths in California, 2002

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. The impact of alcohol abuse on chronic liver disease in this country is immense.

This report presents the most current data on chronic liver disease and cirrhosis deaths, and provides analysis of crude and age-adjusted death rates for California residents by sex, age, race/ethnicity, and county. This report presents data for the year 2002. 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 the National Center for Health Statistics (NCHS) Monthly Vital Statistics Report.

Chronic Liver Disease and Cirrhosis Deaths

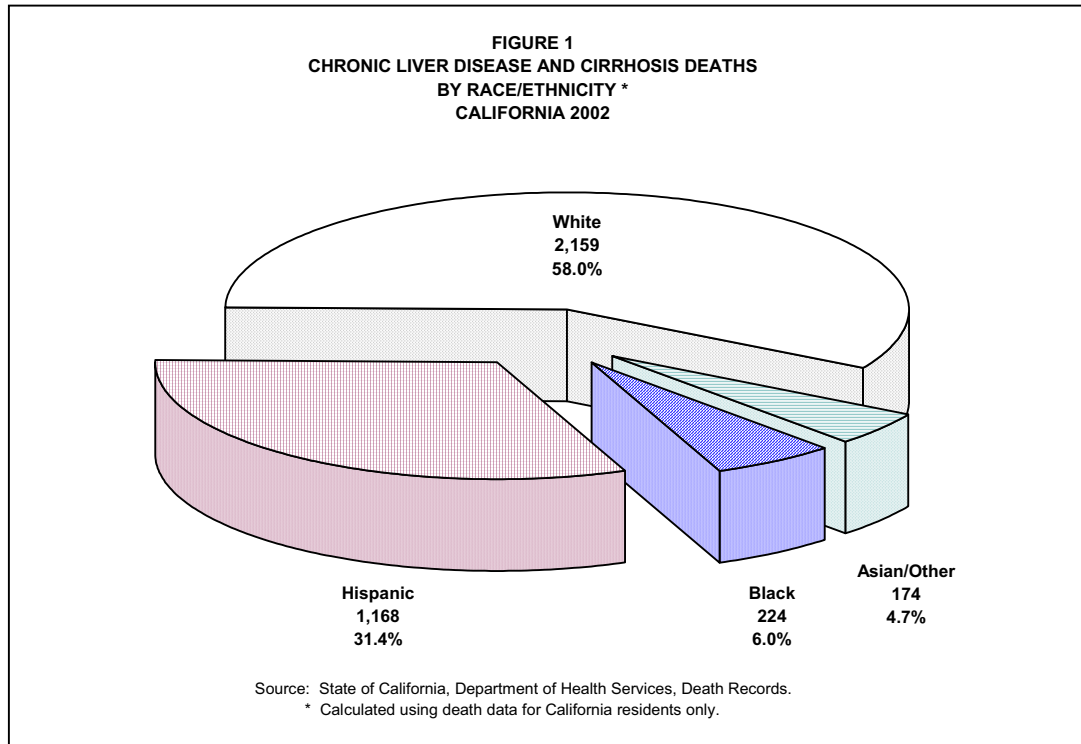
Table 1 (page 9) displays chronic liver disease and cirrhosis death data for 2002 by race/ethnicity, age, and sex. Chronic liver disease and cirrhosis deaths occur almost exclusively among the adult population, and this held true in 2002 with a large number of deaths occurring in the 35 to 44 age group and continuing through all the older age groups (Table 1). During this period, the number of deaths attributed to chronic liver disease and cirrhosis was 1.9 times higher among males (2,458) than among females (1,267).

As shown in Figure 1 (page 2), the number of chronic liver disease and cirrhosis deaths among Whites (2,159) was higher than Hispanics (1,168), Blacks (224), and Asian/Other (174).

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

2 National Center for Health Statistics, Deaths: Preliminary Data for 1999, National Vital Statistics Reports, DHHS Publication No. (PHS) 2001-1120, PRS 01-0358, June 2001; Volume 49, Number 3.

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



Chronic Liver Disease and Cirrhosis Crude Death Rates

The chronic liver disease and cirrhosis crude death rate for California decreased slightly from 10.7 deaths per 100,000 population in 2001 to 10.4 in 2002.³ As shown in **Table 1** (page 9), Whites had the highest crude death rate in 2002, a rate of 12.3. Hispanics were next with a crude rate of 10.3, followed by Blacks with a rate of 9.4, and Asian/Other with a rate of 3.9. All of these four rates decreased from 2001 when Whites had a chronic liver disease and cirrhosis crude death rate of 12.6, Hispanics had a rate of 10.4, Blacks had a rate of 9.5, and Asian/Other had a rate of 4.2.³ None of these changes were statistically significant.

Figure 2 (page 3) shows that in 2002, males in all four race/ethnic groups had higher chronic liver disease and cirrhosis crude death rates than females in the corresponding groups. White males had a rate of 15.6 deaths per 100,000 population and White females had a rate of 9.0. Hispanic males had a rate of 14.8 and Hispanic females had a rate of 5.4. Black males had a rate of 10.2 and Black females had a rate of 8.7. Asian/Other males had a rate of 4.7 and Asian/Other females had a rate of 3.0. These differences were statistically significant except for the difference between Black males and Black females.

Chronic Liver Disease and Cirrhosis Age-Specific Death Rates

In **Table 1** (page 9), reliable age-specific rates show that among the sexes in 2002, males consistently had higher chronic liver disease and cirrhosis death rates than females. This held true among Whites, Hispanics, and Blacks. Among Asian/Other, none of the rates could be compared because of a lack of reliability.

³ Cox D. Chronic Liver Disease and Cirrhosis Deaths in California, 2001. Data Summary. Center for Health Statistics, California Department of Health Services, November 2003.

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

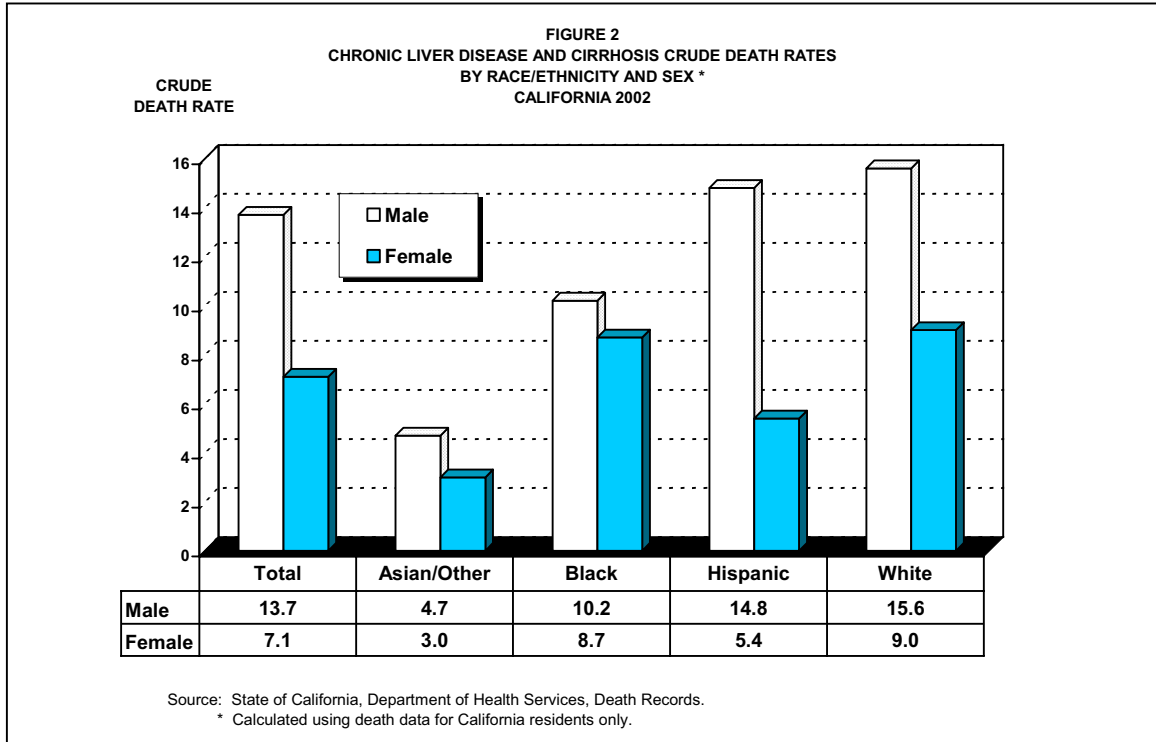
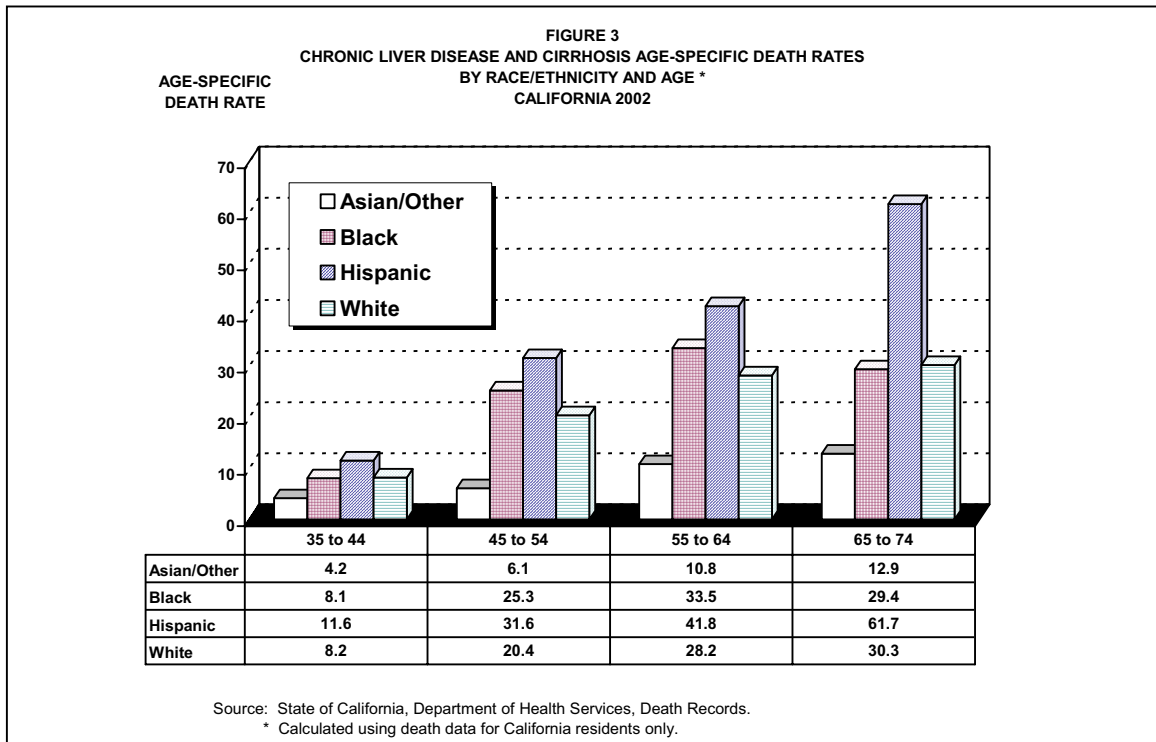


Figure 3 shows that in 2002, among the age groups with reliable rates, Hispanics had higher chronic liver disease and cirrhosis age-specific death rates than the other three race/ethnic groups. These differences were statistically significant in the 35 to 44 and 65 to 74 age groups.

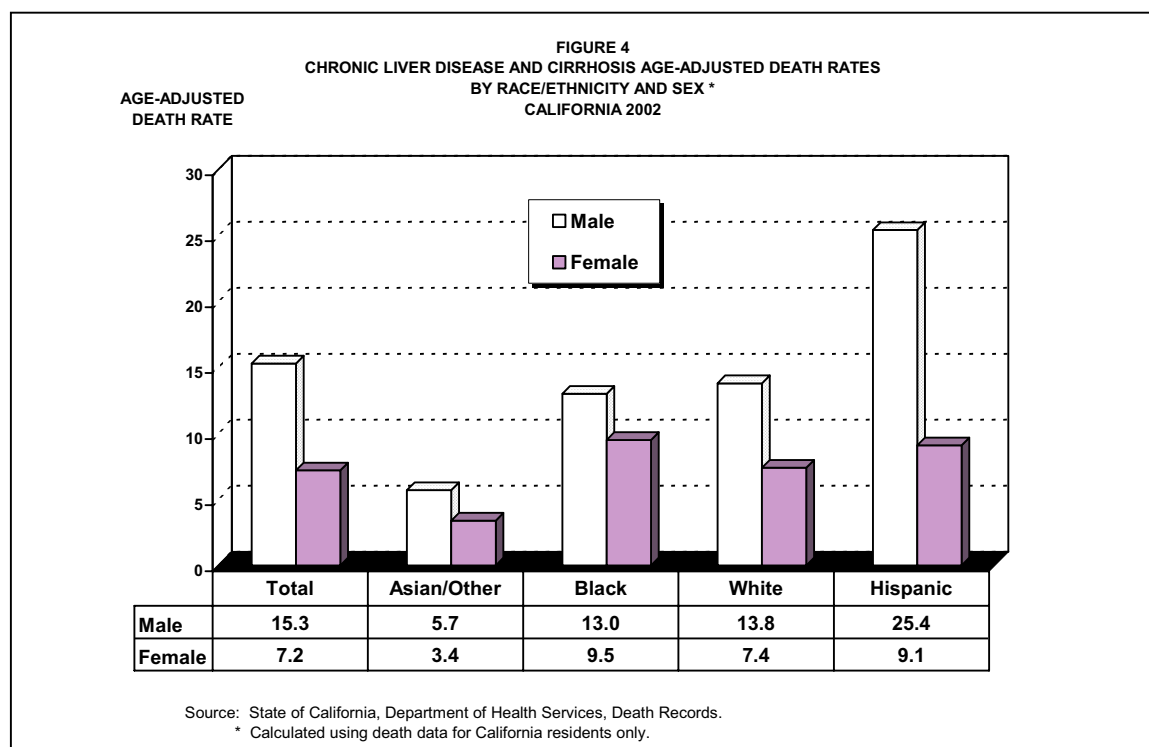


See the Vital Statistics Query System (VSQ) at our Web site www.dhs.ca.gov/hisp/Applications/vsq/vsq.cfm to create your own vital statistics tables.

Not shown in **Figure 3** (page 3), but displayed in **Table 1** (page 9), are the chronic liver disease and cirrhosis age-specific death rates for the 25 to 34 age group where Hispanics (2.4) had the highest rate, and Whites (1.0) had a lower rate. The rates for Asian/Other and Blacks were unreliable for this age group. In the 75 to 84 age group, Hispanics (54.0) had the highest death rate while Whites (32.5) and Asian/Other (19.4) had lower rates. The rate for Blacks was unreliable for this age group. In the 85 and Older age group Whites (20.6) had the only reliable rate.

Chronic Liver Disease and Cirrhosis Age-Adjusted Death Rates

In 2002 the United States chronic liver disease and cirrhosis age-adjusted death rate (9.3 per 100,000 population) was lower than the California rate (11.1).⁴ 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.⁵



As shown in **Figure 4**, in 2002 the chronic liver disease and cirrhosis age-adjusted death rate for males was higher than for females in all four of the race/ethnic groups. Hispanic males (25.4) had a higher rate than Hispanic females (9.1). This pattern was the same for Black males (13.0) and females (9.5), White males (13.8) and females (7.4), and Asian/Other males (5.7) and females (3.4). All of these differences were statistically significant. The data for 2001 and 2002 show that the only significant change from year-to-year, for either sex within any of the four race/ethnic groups, was an increase in the age-adjusted death rate for Black females from 6.9 deaths per 100,000 population in 2001 to 9.5 in 2002.³

⁴ National Center for Health Statistics, Deaths: Preliminary Data for 2002, National Vital Statistics Reports, DHHS Publication Number (PHS) 2004-1120, PRS 04-0167, February 2004; Volume 52, Number 13.

⁵ U.S. Department of Health and Human Services. *Healthy People 2010* Volume II. Washington DC: U.S. Government Printing Office, November 2000.

For more data, see DHS Center for Health Statistics, Home Page at www.dhs.ca.gov/org/hisp/chs/default.htm

Displayed in **Table 1** (page 9), a comparison among the race/ethnic groups shows that in 2002 Hispanics had an age-adjusted death rate of 17.1 deaths per 100,000 population. This rate was significantly higher than the rates for the other three race/ethnic groups where Blacks had a rate of 11.0, Whites had a rate of 10.5, and Asian/Other had a rate of 4.5. The age-adjusted rates for all four of the race/ethnic groups declined from 2001 when Hispanics had a rate of 17.9, Blacks had a rate of 11.2, Whites had a rate of 10.9 and Asian/Other had a rate of 4.9.³ None of the differences from 2001 to 2002 were statistically significant.

Chronic Liver Disease and Cirrhosis Death Data for California Counties

Table 2 (page 10) displays the number of deaths, crude death rates, and age-adjusted death rates by county averaged over a three-year period, 2000 to 2002. 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 (1,072.0) and the lowest in Alpine County (0.3).

The highest and lowest reliable chronic liver disease and cirrhosis crude death rates were in Butte County (17.7 per 100,000 population) and San Mateo County (7.9), respectively.

The ranking for chronic liver disease and cirrhosis age-adjusted death rates showed Imperial County with the highest reliable rate (21.5 deaths per 100,000 population) and San Mateo County with the lowest (7.5).

**TABLE 3
CHRONIC LIVER DISEASE AND CIRRHOSIS DEATHS
AMONG THE LOCAL HEALTH JURISDICTIONS*
CALIFORNIA, 2000-2002**

LOCAL HEALTH JURISDICTION	NUMBER OF DEATHS (Average)	2001 POPULATION	CRUDE DEATH RATE
BERKELEY	5.7	103,600	5.5 +
LONG BEACH	50.0	466,500	10.7
PASADENA	17.3	135,300	12.8 +

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, 2001-2003, with 2000 DRU Benchmark, May 2003.
State of California, Department of Health Services, Death records.

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

Chronic Liver Disease and Cirrhosis Death Data by City Health Jurisdiction

Table 3 (page 5) displays the number of deaths and crude death rates for California's three city health jurisdictions averaged over a three-year period, 2000 to 2002. Age-adjusted death 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 average of 50.0 chronic liver disease and cirrhosis deaths, Pasadena had 17.3, and Berkeley had 5.7.

Pasadena had a chronic liver disease and cirrhosis crude death rate of 12.8 deaths per 100,000 population, Long Beach had a crude rate of 10.7, and Berkeley had a crude rate of 5.5, though 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 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 National Center for Health Statistics.² 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-10.⁶ 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 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 four race/ethnic groups presented in the tables 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 the “Asian/Other race/ethnic group” includes: Aleut, American Indian, Asian Indian, Asian (specified/unspecified), Cambodian, Chinese, Eskimo, Filipino, Guamanian, Hawaiian, Hmong, 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.⁷

Beginning in 2000, federal race/ethnicity reporting guidelines changed to allow the reporting of up to three races on death certificates. The race/ethnic groups in this report were tabulated based on the first listed race on those certificates where more than one race was listed. Race groups for 2000 are therefore not strictly compatible with prior years and trends should be viewed with caution.

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 National Center for Health Statistics. The new population standard affects measurement of mortality trends and group comparisons. Of particular note are the effects on race comparison of mortality.⁸ 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 3** (page 5) differ from the population data used to calculate the crude rates in **Table 2** (page 10). Consequently, caution should be exercised when comparing the crude rates among the three health jurisdictions with the rates among the 58 California counties. Age-adjusted rates for city health jurisdictions were not calculated.

For a more complete explanation of the age-adjusting methodology used in this report, see the “Healthy People 2010 Statistical Notes” publication.⁹ Detailed information on data quality and limitations are presented in the appendix of the annual report,

⁶ World Health Organization. International Statistical Classification of Diseases and Related Health Problems. Tenth Revision. Geneva: World Health Organization. 1992.

⁷ 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 Number 128, National Center for Health Statistics, DHHS Publication Number (PHS) 99-1328, September 1999.

⁸ Anderson RN, Rosenberg HM. Age Standardization of Death Rates: Implementation of the Year 2000 Standard. National Vital Statistics reports; Volume 47 Number 3, Hyattsville, Maryland: National Center for Health Statistics.

⁹ 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, Number 20, January 2001.

Some of the [earlier reports](#) on this subject are available online.

“Vital Statistics of California”.¹⁰ Formulas used to calculate death rates are included in the technical notes of the “County Health Status Profiles” report.¹¹

This Data Summary was prepared by Daniel H. Cox, Center for Health Statistics, 1616 Capitol Avenue, Room 74.165, MS 5103, P.O. Box 997410, Sacramento, CA 95899-7410, Telephone (916) 552-8095 and Fax (916) 650-6889.

¹⁰ Riedmiller K, Ficenec S, Bindra K, Christensen J. Vital Statistics of California 1999. Center for Health Statistics, California Department of Health Services, April 2002.

¹¹ Schmidt C, Wilson C. County Health Status Profiles 2003. Center for Health Statistics, California Department of Health Services, April 2003.

TABLE 2
CHRONIC LIVER DISEASE AND CIRRHOSIS DEATHS
CALIFORNIA, 2000-2002
(By Place of Residence)

COUNTY	2000-2002 DEATHS (Average)	PERCENT	2001 POPULATION	CRUDE RATE	AGE-ADJUSTED RATE	95% CONFIDENCE LIMITS	
						LOWER	UPPER
CALIFORNIA	3,719.0	100.0	35,233,335	10.6	11.4	11.0	11.8
ALAMEDA	144.7	3.9	1,492,004	9.7	10.0	8.4	11.6
ALPINE	0.3	0.0 a	1,268	26.3 *	26.7 *	0.0	117.3
AMADOR	4.7	0.1	35,242	13.2 *	10.4 *	0.8	20.0
BUTTE	37.7	1.0	213,040	17.7	16.6	11.3	22.0
CALAVERAS	5.0	0.1	43,392	11.5 *	10.3 *	1.1	19.5
COLUSA	2.3	0.1	22,012	10.6 *	11.6 *	0.0	26.5
CONTRA COSTA	96.0	2.6	942,662	10.2	9.7	7.7	11.6
DEL NORTE	5.0	0.1	31,801	15.7 *	16.0 *	1.9	30.0
EL DORADO	16.0	0.4	168,912	9.5 *	8.8 *	4.5	13.1
FRESNO	95.0	2.6	825,365	11.5	13.6	10.8	16.3
GLENN	3.3	0.1	30,291	11.0 *	12.1 *	0.0	25.1
HUMBOLDT	22.7	0.6	129,211	17.5	17.2	10.1	24.3
IMPERIAL	26.7	0.7	161,177	16.5	21.5	13.3	29.6
INYO	5.0	0.1	18,510	27.0 *	23.5 *	2.0	45.0
KERN	102.0	2.7	694,749	14.7	17.0	13.7	20.4
KINGS	15.3	0.4	129,375	11.9 *	16.2 *	8.0	24.3
LAKE	15.7	0.4	62,080	25.2 *	23.6 *	11.5	35.8
LASSEN	2.3	0.1	36,759	6.3 *	7.0 *	0.0	16.0
LOS ANGELES	1,072.0	28.8	9,925,413	10.8	12.1	11.4	12.8
MADERA	19.7	0.5	131,052	15.0 *	16.8 *	9.4	24.3
MARIN	23.7	0.6	249,634	9.5	9.0	5.4	12.7
MARIPOSA	3.7	0.1	17,218	21.3 *	16.6 *	0.0	34.1
MENDOCINO	11.0	0.3	91,963	12.0 *	11.5 *	4.6	18.3
MERCED	25.0	0.7	219,936	11.4	14.3	8.7	19.9
MODOC	2.3	0.1	10,589	22.0 *	21.8 *	0.0	50.4
MONO	2.0	0.1	11,081	18.0 *	17.1 *	0.0	41.8
MONTEREY	40.3	1.1	409,511	9.8	11.4	7.9	14.9
NAPA	20.0	0.5	129,130	15.5	13.8	7.7	19.8
NEVADA	13.7	0.4	99,670	13.7 *	11.3 *	5.1	17.4
ORANGE	231.0	6.2	2,872,632	8.0	9.0	7.8	10.2
PLACER	29.3	0.8	252,688	11.6	10.9	6.9	14.9
PLUMAS	2.3	0.1	21,044	11.1 *	11.7 *	0.0	27.1
RIVERSIDE	186.7	5.0	1,626,134	11.5	12.2	10.4	13.9
SACRAMENTO	129.0	3.5	1,236,054	10.4	10.9	9.0	12.8
SAN BENITO	6.0	0.2	53,577	11.2 *	12.7 *	2.5	22.9
SAN BERNARDINO	206.3	5.5	1,771,707	11.6	14.4	12.4	16.4
SAN DIEGO	278.7	7.5	3,005,038	9.3	11.1	9.8	12.4
SAN FRANCISCO	85.7	2.3	794,342	10.8	9.2	7.3	11.2
SAN JOAQUIN	71.3	1.9	593,538	12.0	13.2	10.2	16.3
SAN LUIS OBISPO	23.0	0.6	262,123	8.8	9.4	5.5	13.3
SAN MATEO	60.3	1.6	759,313	7.9	7.5	5.6	9.4
SANTA BARBARA	38.7	1.0	417,331	9.3	9.7	6.6	12.7
SANTA CLARA	144.3	3.9	1,795,132	8.0	8.6	7.2	10.0
SANTA CRUZ	27.0	0.7	264,525	10.2	10.2	6.3	14.1
SHASTA	24.7	0.7	179,892	13.7	13.1	7.9	18.3
SIERRA	0.7	0.0 a	3,465	19.2 *	19.4 *	0.0	67.6
SISKIYOU	6.3	0.2	45,624	13.9 *	12.1 *	2.5	21.8
SOLANO	44.7	1.2	408,095	10.9	12.2	8.5	15.8
SONOMA	49.0	1.3	468,682	10.5	9.9	7.1	12.6
STANISLAUS	59.0	1.6	472,096	12.5	14.0	10.5	17.6
SUTTER	8.7	0.2	83,999	10.3 *	10.3 *	3.4	17.1
TEHAMA	9.0	0.2	57,642	15.6 *	14.8 *	4.9	24.7
TRINITY	3.0	0.1	13,605	22.1 *	17.2 *	0.0	36.8
TULARE	50.3	1.4	388,730	12.9	15.7	11.4	20.0
TUOLUMNE	8.7	0.2	57,497	15.1 *	13.6 *	4.4	22.7
VENTURA	73.3	2.0	763,586	9.6	10.1	7.8	12.4
YOLO	19.7	0.5	167,259	11.8 *	14.8 *	8.2	21.3
YUBA	9.3	0.3	64,938	14.4 *	17.1 *	6.1	28.1

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

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

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

Source : State of California, Department of Finance; 2001 Population: Population Projections by Age, Race/Ethnicity and Sex, December 1998.
State of California, Department of Health Services, Death Records.