



CENTER FOR HEALTH STATISTICS
DATA SUMMARY

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**CEREBROVASCULAR
DISEASE DEATHS
CALIFORNIA, 1997**

Introduction

Cerebrovascular disease has historically been one of the leading causes of death in the United States and in California. In the United States an estimated 600,000 people suffer a new or recurrent stroke each year; 28 percent of these stroke victims are under age 65.¹

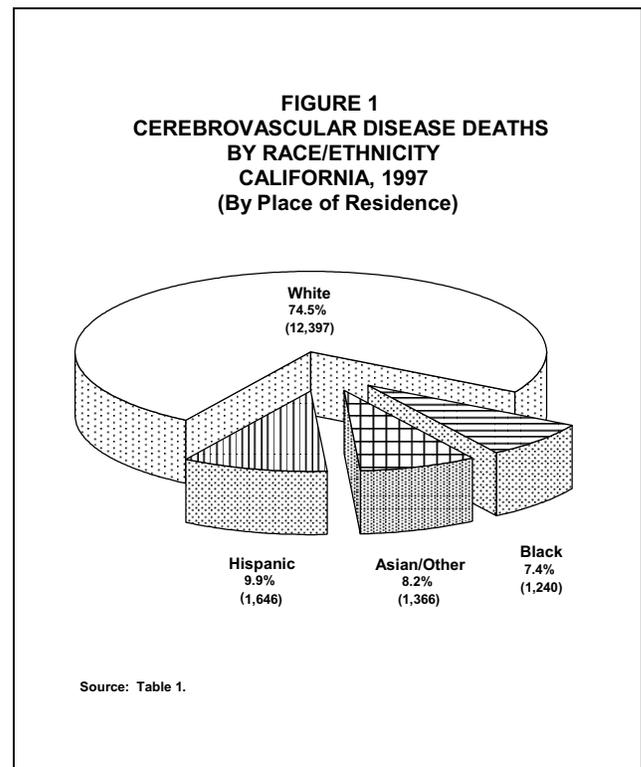
This report presents the most current data on cerebrovascular disease deaths, and provides analysis of crude and age-adjusted death rates for California residents by sex, age, and race/ethnicity. The definition of cerebrovascular disease used in this report is based on the ICD-9 codes 430-438 traditionally presented in National Center for Health Statistics reports.²

The method used to analyze vital statistics data is also 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, on the other hand, show the actual rate of dying in a given population, but the age composition of that population is not taken into consideration. Therefore, the use of age-adjusted death rates becomes the preferred method for measuring death rates over time, and for comparing death rates between race/ethnic groups, sex, and geographic areas. The 1940 United States (standard million) population was used as the basis for age-adjusting in this report.

Cerebrovascular Disease Deaths

Table 1 (page 5) displays cerebrovascular disease death data for 1997 by race/ethnicity, age, and sex. Cerebrovascular disease deaths occur predominantly among the older population, and this held true in 1997 with 87.3

percent of all cerebrovascular disease deaths involving people 65 years and older. This age group, within each respective race/ethnic group, accounted for 91.9 percent of all cerebrovascular disease deaths among Whites, 79.1 percent of deaths among Asian/Other, 71.9 percent of deaths among Hispanics, and 71.0 percent of deaths among Blacks. During this period, the number of deaths attributed to cerebrovascular disease was 48.3 percent higher among females (9,943) than among males (6,706).



As shown in **Figure 1**, the number of cerebrovascular disease deaths among Whites (12,397) was much higher than Hispanics (1,646), Asian/Other (1,366), and Blacks (1,240).

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Cerebrovascular Disease Crude Death Rates

The cerebrovascular disease crude death rate for California declined slightly from 50.9 deaths per 100,000 population in 1996 to 50.5 in 1997. As shown in **Table 1** (page 5), Whites had the highest crude death rate in 1997, a rate of 72.0. Blacks were next with a crude rate of 53.6. Asian/Other and Hispanics were last with rates of 36.1 and 17.1, respectively.

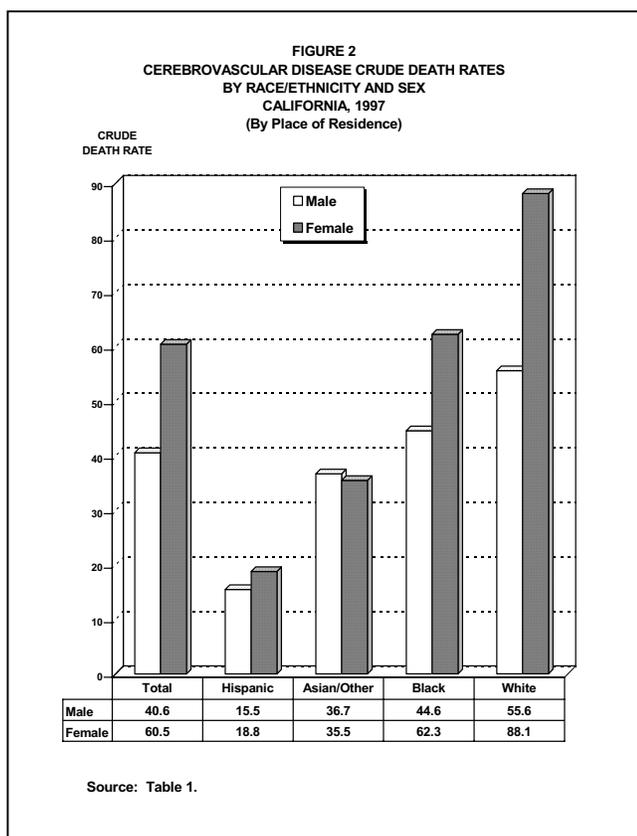


Figure 2 shows Hispanic, Black, and White females had significantly higher cerebrovascular disease crude death rates than males in the corresponding race/ethnic groups. Hispanic females had a rate of 18.8 deaths per 100,000 population and Hispanic males had a rate of 15.5. Black females had a rate of 62.3 and Black males had a rate of 44.6. White females had a rate of 88.1 and White males had a rate of 55.6. Contrary to the other three race/ethnic groups, Asian/Other males had a higher rate than females, although this difference was not statistically significant.

Cerebrovascular Disease Age-Specific Death Rates

In **Table 1** (page 5) reliable age-specific rates show that among the sexes, Asian/Other males consistently had higher rates than Asian/Other females. Among Blacks, males had higher rates in the age groups 55 to 64, 65 to 74, and 85 & older, while females had higher rates in the remaining age groups. Hispanic males had higher rates than Hispanic females, except in the 75 to 84 age group. White males had higher rates than White females, except for the 85 & older age group.

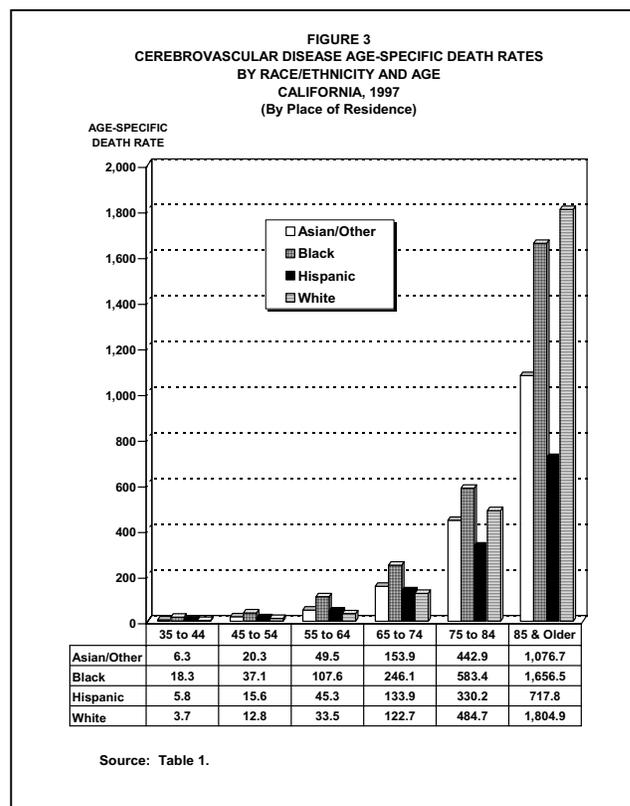


Figure 3 shows that Blacks had higher age-specific death rates than the other three race/ethnic groups, except in the 85 & older group where Whites had the highest rate. Not shown in **Figure 3**, but displayed in **Table 1** (page 5), are the cerebrovascular disease age-specific death rates for the 25 to 34 age group where Hispanics (2.0) had the highest rate and Whites (0.8) had the lowest. The rates for the other two race/ethnic groups, Asian/Other and Black, were unreliable for this age group.

Cerebrovascular Disease Age-Adjusted Death Rates

In 1997 the United States cerebrovascular disease age-adjusted death rate (25.9 per 100,000 population) was slightly higher than the California rate (25.5).³ During this year, California did not meet the *Healthy People 2000* objective of no more than 20.0 age-adjusted cerebrovascular disease deaths per 100,000 population.⁴ An objective was also established for Blacks; a goal of no more than 27.0 age-adjusted cerebrovascular disease deaths per 100,000 population. Since Blacks had an age-adjusted death rate of 43.2, this goal was not met in 1997. *Healthy People 2000* goals were not established for any other race/ethnic group.

A comparison among the race/ethnic groups shows that Blacks (43.2) had an age-adjusted death rate significantly higher than Asian/Other (25.7), Whites (24.4), and Hispanics (21.0).

statistically significant for Asian/Other, Hispanics, and Whites.

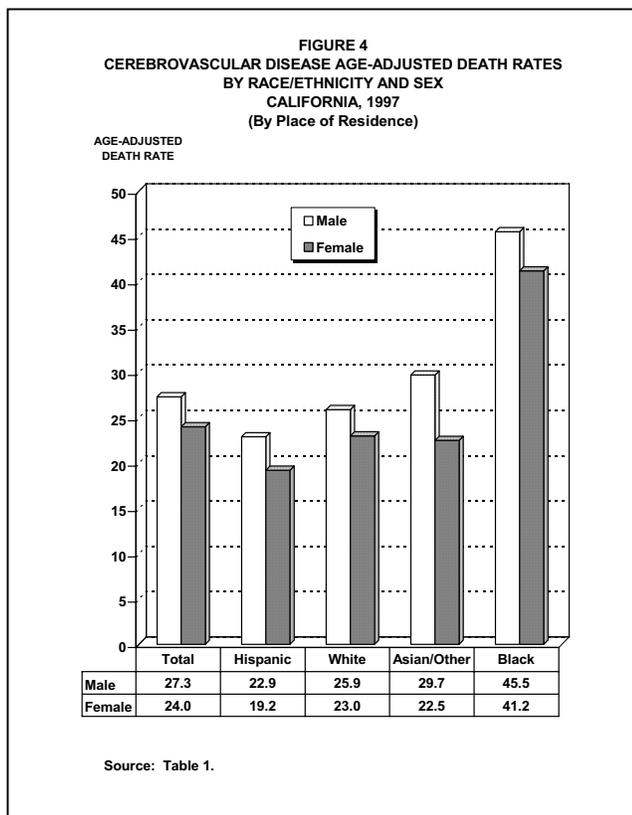
Notes:

The cerebrovascular disease death data presented in this report are ICD-9 codes 430-438.

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).

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, Japanese, Korean, Vietnamese, Other Pacific Islander, Samoan, Thai, and Laotian. 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.⁵



As shown in **Figure 4**, the cerebrovascular disease age-adjusted death rate for males was higher than for females in all four of the race/ethnic groups. These differences were

For a complete explanation of the age-adjusting methodology used in this report see the *Healthy People 2000 Statistical Notes* publication.⁶ Detailed information on data quality and limitations as well as the formulas used to

calculate vital statistics rates are presented in the appendix of the annual report, *Vital Statistics of California*.⁷ Another source of information is the Department of Health Services, Center for Health Statistics Home Page [www.dhs.ca.gov/org/hisp/chs/chsindex.htm].

References:

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2. National Center for Health Statistics, Births and Deaths: United States, 1996, *Monthly Vital Statistics Report*, DHHS Pub. No. (PHS) 97-1120, Supplement 2, September 1997; Vol. 46, No. 1, pp. 24-25.
3. National Center for Health Statistics, Births and Deaths: Final Data for 1997, *National Vital Statistics Reports*, DHHS Pub. No. (PHS) 99-1120, 9-0472, June 1999; Vol. 47, No. 19, pp. 24-26.
4. Richards F. *Healthy California 2000: Midcourse Review, California's Experience in Achieving the National Health Promotion and Disease Prevention Objectives*. Center for Health Statistics, California Department of Health Services, June 1999.
5. Hahn RA, Mulinare J, Teutsch SM. Inconsistencies in Coding Race and Ethnicity Between Birth and Death in US Infants. *The Journal of the American Medical Association*, Vol. 267, No. 2, January 1992.
6. Curtin LR, Klein RJ. Direct Standardization (Age-Adjusted Death Rates), *Healthy People 2000 Statistical Notes*, No. 6 – Revised, National Center for Health Statistics, DHHS Pub. No. (PHS) 95-1237, March 1995.
7. Riedmiller K, Harms C. *Vital Statistics of California, 1996*. Center for Health Statistics, California Department of Health Services, September 1998.

TABLE 1
DEATHS DUE TO CEREBROVASCULAR DISEASE BY RACE/ETHNICITY, AGE, AND SEX
CALIFORNIA, 1997
(By Place of Residence)

AGE GROUPS	DEATHS			POPULATION			RATES			95% CONFIDENCE LIMITS					
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL		MALE		FEMALE	
										LOWER	UPPER	LOWER	UPPER	LOWER	UPPER
TOTAL															
Under 1	32	18	14	526,869	269,593	257,276	6.1	6.7 *	5.4 *	4.0	8.2	3.6	9.8	2.6	8.3
1 to 4	3	2	1	2,247,883	1,150,084	1,097,799	0.1 *	0.2 *	0.1 *	0.0	0.3	0.0	0.4	0.0	0.3
5 to 14	7	5	2	5,126,482	2,623,174	2,503,308	0.1 *	0.2 *	0.1 *	0.0	0.2	0.0	0.4	0.0	0.2
15 to 24	24	12	12	4,287,123	2,231,053	2,056,070	0.6	0.5 *	0.6 *	0.3	0.8	0.2	0.8	0.3	0.9
25 to 34	79	43	36	5,295,965	2,801,042	2,494,923	1.5	1.5	1.4	1.2	1.8	1.1	2.0	1.0	1.9
35 to 44	308	172	136	5,520,289	2,806,428	2,713,861	5.6	6.1	5.0	5.0	6.2	5.2	7.0	4.2	5.9
45 to 54	627	355	272	3,972,821	1,971,051	2,001,770	15.8	18.0	13.6	14.5	17.0	16.1	19.9	12.0	15.2
55 to 64	1,027	579	448	2,432,927	1,183,049	1,249,878	42.2	48.9	35.8	39.6	44.8	45.0	52.9	32.5	39.2
65 to 74	2,614	1,312	1,302	1,949,636	882,049	1,067,587	134.1	148.7	122.0	128.9	139.2	140.7	156.8	115.3	128.6
75 to 84	5,650	2,374	3,276	1,205,134	486,886	718,248	468.8	487.6	456.1	456.6	481.1	468.0	507.2	440.5	471.7
85 & Older	6,278	1,834	4,444	391,566	120,167	271,399	1,603.3	1,526.2	1,637.4	1,563.6	1,643.0	1,456.4	1,596.1	1,589.3	1,685.6
Total	16,649	6,706	9,943	32,956,695	16,524,576	16,432,119	50.5	40.6	60.5	49.8	51.3	39.6	41.6	59.3	61.7
Age-Adjusted							25.5	27.3	24.0	25.1	26.0	26.6	28.0	23.4	24.5
ASIAN/OTHER															
Under 1	4	2	2	60,238	31,180	29,058	6.6 *	6.4 *	6.9 *	0.1	13.1	0.0	15.3	0.0	16.4
1 to 4	0	0	0	254,370	130,902	130,902	0.0 +	0.0 +	0.0 +	-	-	-	-	-	-
5 to 14	1	0	1	591,663	303,064	288,599	0.2 *	0.0 +	0.3 *	0.0	0.5	-	-	0.0	1.0
15 to 24	2	1	1	548,570	281,839	266,731	0.4 *	0.4 *	0.4 *	0.0	0.9	0.0	1.1	0.0	1.1
25 to 34	8	4	4	612,830	309,144	303,686	1.3 *	1.3 *	1.3 *	0.4	2.2	0.0	2.6	0.0	2.6
35 to 44	41	21	20	651,237	313,355	337,882	6.3	6.7	5.9	4.4	8.2	3.8	9.6	3.3	8.5
45 to 54	95	56	39	467,272	221,503	245,769	20.3	25.3	15.9	16.2	24.4	18.7	31.9	10.9	20.8
55 to 64	134	73	61	270,964	127,874	143,090	49.5	57.1	42.6	41.1	57.8	44.0	70.2	31.9	53.3
65 to 74	302	164	138	196,266	85,253	111,013	153.9	192.4	124.3	136.5	171.2	162.9	221.8	103.6	145.1
75 to 84	450	210	240	101,593	43,544	58,049	442.9	482.3	413.4	402.0	483.9	417.0	547.5	361.1	465.8
85 & Older	329	152	177	30,556	13,077	17,479	1,076.7	1,162.3	1,012.6	960.4	1,193.1	977.6	1,347.1	863.5	1,161.8
Total	1,366	683	683	3,785,559	1,860,735	1,924,824	36.1	36.7	35.5	34.2	38.0	34.0	39.5	32.8	38.1
Age-Adjusted							25.7	29.7	22.5	24.3	27.2	27.4	32.1	20.7	24.4
BLACK															
Under 1	7	2	5	36,610	18,680	17,930	19.1 *	10.7 *	27.9 *	5.0	33.3	0.0	25.5	3.4	52.3
1 to 4	0	0	0	162,632	82,532	80,100	0.0 +	0.0 +	0.0 +	-	-	-	-	-	-
5 to 14	2	2	0	402,151	203,623	198,528	0.5 *	1.0 *	0.0 +	0.0	1.2	0.0	2.3	-	-
15 to 24	1	1	0	349,439	184,772	164,667	0.3 *	0.5 *	0.0 +	0.0	0.8	0.0	1.6	-	-
25 to 34	15	7	8	389,632	201,917	187,715	3.8 *	3.5 *	4.3 *	1.9	5.8	0.9	6.0	1.3	7.2
35 to 44	70	30	40	382,112	185,435	196,677	18.3	16.2	20.3	14.0	22.6	10.4	22.0	14.0	26.6
45 to 54	95	44	51	255,815	120,369	135,446	37.1	36.6	37.7	29.7	44.6	25.8	47.4	27.3	48.0
55 to 64	170	96	74	157,984	73,960	84,024	107.6	129.8	88.1	91.4	123.8	103.8	155.8	68.0	108.1
65 to 74	256	126	130	104,036	44,736	59,300	246.1	281.7	219.2	215.9	276.2	232.5	330.8	181.5	256.9
75 to 84	333	114	219	57,082	21,249	35,833	583.4	536.5	611.2	520.7	646.0	438.0	635.0	530.2	692.1
85 & Older	291	87	204	17,567	5,225	12,342	1,656.5	1,665.1	1,652.9	1,466.2	1,846.8	1,315.2	2,015.0	1,426.1	1,879.7
Total	1,240	509	731	2,315,060	1,142,498	1,172,562	53.6	44.6	62.3	50.6	56.5	40.7	48.4	57.8	66.9
Age-Adjusted							43.2	45.5	41.2	40.7	45.8	41.5	49.6	37.9	44.5
HISPANIC															
Under 1	9	5	4	249,820	127,321	122,499	3.6 *	3.9 *	3.3 *	1.2	6.0	0.5	7.4	0.1	6.5
1 to 4	2	1	1	1,028,081	524,193	503,888	0.2 *	0.2 *	0.2 *	0.0	0.5	0.0	0.6	0.0	0.6
5 to 14	0	0	0	1,940,843	989,960	950,883	0.0 +	0.0 +	0.0 +	-	-	-	-	-	-
15 to 24	12	3	9	1,466,796	761,756	705,040	0.8 *	0.4 *	1.3 *	0.4	1.3	0.0	0.8	0.4	2.1
25 to 34	36	22	14	1,820,565	1,021,849	798,716	2.0	2.2	1.8 *	1.3	2.6	1.3	3.1	0.8	2.7
35 to 44	83	56	27	1,432,765	755,866	676,899	5.8	7.4	4.0	4.5	7.0	5.5	9.3	2.5	5.5
45 to 54	124	75	49	795,482	401,656	393,826	15.6	18.7	12.4	12.8	18.3	14.4	22.9	9.0	15.9
55 to 64	196	115	81	432,489	208,812	223,677	45.3	55.1	36.2	39.0	51.7	45.0	65.1	28.3	44.1
65 to 74	389	193	196	290,567	131,786	158,781	133.9	146.4	123.4	120.6	147.2	125.8	167.1	106.2	140.7
75 to 84	438	173	265	132,632	53,301	79,331	330.2	324.6	334.0	299.3	361.2	276.2	372.9	293.8	374.3
85 & Older	357	131	226	49,737	17,451	32,286	717.8	750.7	700.0	643.3	792.2	622.1	879.2	608.7	791.3
Total	1,646	774	872	9,639,777	4,993,951	4,645,826	17.1	15.5	18.8	16.3	17.9	14.4	16.6	17.5	20.0
Age-Adjusted							21.0	22.9	19.2	19.9	22.1	21.3	24.6	17.8	20.6
WHITE															
Under 1	12	9	3	180,201	92,412	87,789	6.7 *	9.7 *	3.4 *	2.9	10.4	3.4	16.1	0.0	7.3
1 to 4	1	1	0	802,800	412,457	390,343	0.1 *	0.2 *	0.0 +	0.0	0.4	0.0	0.7	-	-
5 to 14	4	3	1	2,191,825	1,126,527	1,065,298	0.2 *	0.3 *	0.1 *	0.0	0.4	0.0	0.6	0.0	0.3
15 to 24	9	7	2	1,922,318	1,002,686	919,632	0.5 *	0.7 *	0.2 *	0.2	0.8	0.2	1.2	0.0	0.5
25 to 34	20	10	10	2,472,938	1,268,132	1,204,806	0.8	0.8 *	0.8 *	0.5	1.2	0.3	1.3	0.3	1.3
35 to 44	114	65	49	3,054,175	1,551,772	1,502,403	3.7	4.2	3.3	3.0	4.4	3.2	5.2	2.3	4.2
45 to 54	313	180	133	2,454,252	1,227,523	1,226,729	12.8	14.7	10.8	11.3	14.2	12.5	16.8	9.0	12.7
55 to 64	527	295	232	1,571,490	772,403	799,087	33.5	38.2	29.0	30.7	36.4	33.8	42.6	25.3	32.8
65 to 74	1,667	829	838	1,358,767	620,274	738,493	122.7	133.7	113.5	116.8	128.6	124.6	142.7	105.8	121.2
75 to 84	4,429	1,877	2,552	913,827	368,792	545,035	484.7	509.0	468.2	470.4	498.9	485.9	532.0	450.1	486.4
85 & Older	5,301	1,464	3,837	293,706	84,414	209,292	1,804.9	1,734.3	1,833.3	1,756.3	1,853.5	1,645.5	1,823.2	1,775.3	1,891.3
Total	12,397	4,740	7,657	17,216,299	8,527,392	8,688,907	72.0	55.6	88.1	70.7	73.3	54.0	57.2	86.1	90.1
Age-Adjusted							24.4	25.9	23.0	23.9	24.9	25.1	26.7	22.3	23.6

Note: Rates are per 100,000 population. ICD-9 codes 430-438.
White, Black, and Asian/Other exclude Hispanic ethnicity.
Hispanic includes any race category.

* 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 not calculated for no (zero) deaths.

Source: State of California, Department of Finance, Race/Ethnic 1997 Population Estimates for Counties with Age and Sex Detail. June 1999.
State of California, Department of Health Services, Death Records.