## Introduction

This report presents data on deaths due to pneumonia and influenza for 1998 with analysis of crude and age-adjusted rates for California residents by sex, age, race/ethnicity, and county. The definition of pneumonia and influenza used in this report is based on the ICD-9 codes 480-487 as traditionally presented in National Center for Health Statistics reports.[1]

Pneumonia and influenza was the 6th leading cause of death nationally (91,871 deaths) and the 4th leading cause of death in California for 1998 (13,316 deaths).[2,3] Pneumonia and influenza usually claim the lives of the very young, the elderly and those persons with compromised immunity systems. Female deaths outnumber male deaths, as females tend to live longer and the elderly are more prone to contract pneumonia and influenza. As **Figure 1** shows, Whites had the highest number of deaths (10,524), or 79.0 percent of all deaths from pneumonia and influenza. The remaining 2,792 pneumonia and influenza deaths (21.0 percent) were collectively among Hispanics, Blacks, and Asian/Others.

Pneumonia alone encompasses many different diseases that involve infection or inflammation of the lungs. Because pneumonia is frequently a complication of influenza, the two diseases are traditionally reported together. Though there are typically more pneumonia deaths each year than influenza deaths, the number of influenza deaths still varies considerably during epidemics. Influenza can be represented by more virulent strains in some years than others as the viruses mutate constantly.[4] Together the number of pneumonia and influenza deaths have

Figure 1
PNEUMONIA AND INFLUENZA DEATHS BY RACE/ETHNICITY
CALIFORNIA, 1998
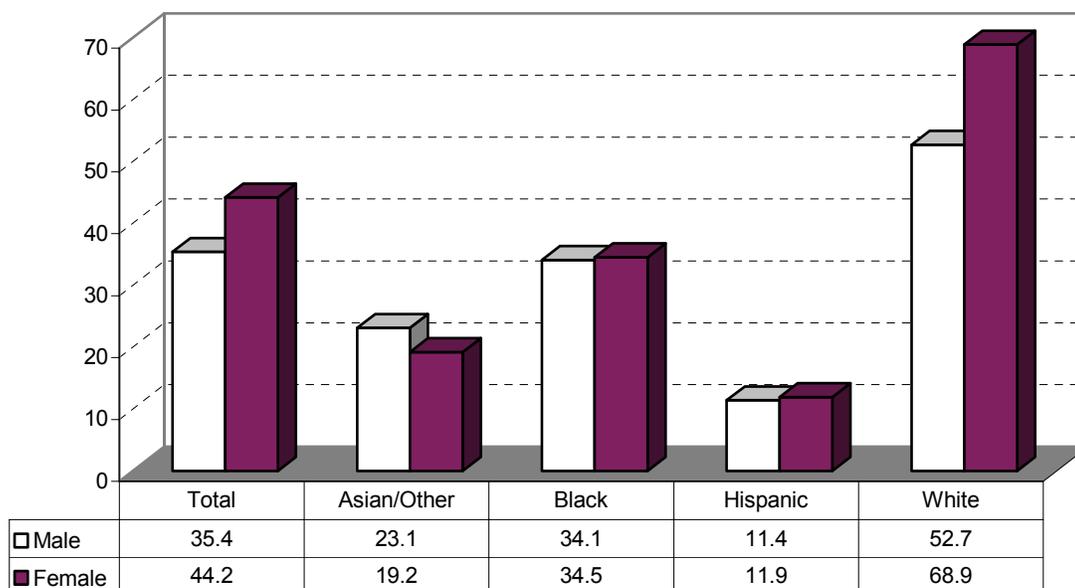(By Place of Residence)
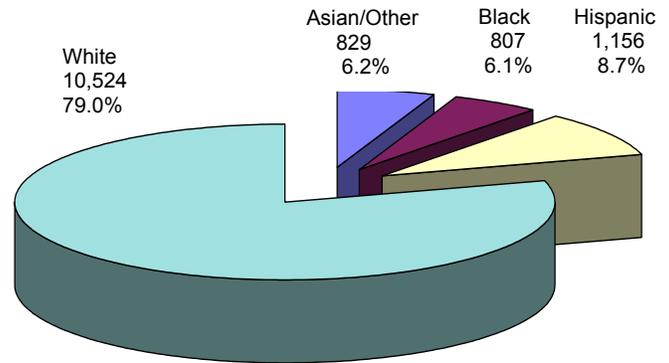
Source: Table 1

fluctuated considerably over the years reflecting the cyclic nature of communicable diseases.

There were 4.8 million reported cases of pneumonia and 95 million cases of influenza in the United States in 1996.[5] The high mortality rate and low immunization rate among high risk populations led the United States Public Health Service to establish a number of national *Healthy People 2000* objectives related to pneumonia and influenza.[6]

The methods used to analyze vital statistics data are also important. Analyzing only the number of deaths 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

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Figure 2
PNEUMONIA AND INFLUENZA CRUDE DEATH RATES
BY RACE/ETHNICITYAND SEX
CALIFORNIA, 1998
(By Place of Residence)

	Total	Asian/Other	Black	Hispanic	White
□ Male	35.4	23.1	34.1	11.4	52.7
■ Female	44.2	19.2	34.5	11.9	68.9

Source: Table 1

consideration. Therefore, the use of age-adjusted death rates becomes the preferred method for measuring death rates over time, and for comparing rates between race/ethnic groups, genders, and geographic areas. The United States 1940 (standard million) population was used as the basis for age-adjusting in this report.

Pneumonia and Influenza Crude Death Rates

As shown in **Table 1** (page 7), California's crude death rate due to pneumonia and influenza for 1998 was 39.8 per 100,000 population, a 6.3 percent increase from the 1997 rate of 37.3.[7] The national crude death rate in 1998 (34.0) was lower than that for California.[2]

California females had the higher crude death rate at 44.2 per 100,000 population in 1998 compared to 35.4 for males. Whites had the highest crude death rate at 60.9, nearly twice as high as the rate among Blacks at 34.3. Asian/Others followed with a rate of 21.1 and Hispanics had the lowest at 11.6.

The differences in crude death rates among the four race/ethnic groups were statistically significant.

As shown in **Figure 2**, White males and females had the highest rates at 52.7 and 68.9 per 100,000 population respectively. Black males and females had the next highest rates (34.1 and 34.5) followed by Asian/Other males and females (23.1 and 19.2), and Hispanic males and females (11.4 and 11.9). The differences between the male and female rates among Whites were statistically significant. The difference between the male and female rates among Asian/Others was also significant, whereas Blacks and Hispanics had no significant differences between their male and female rates. In addition, although the pneumonia and influenza crude death rates are generally higher among females than males, the rate among Asian/Other males was higher than for Asian/Other females.
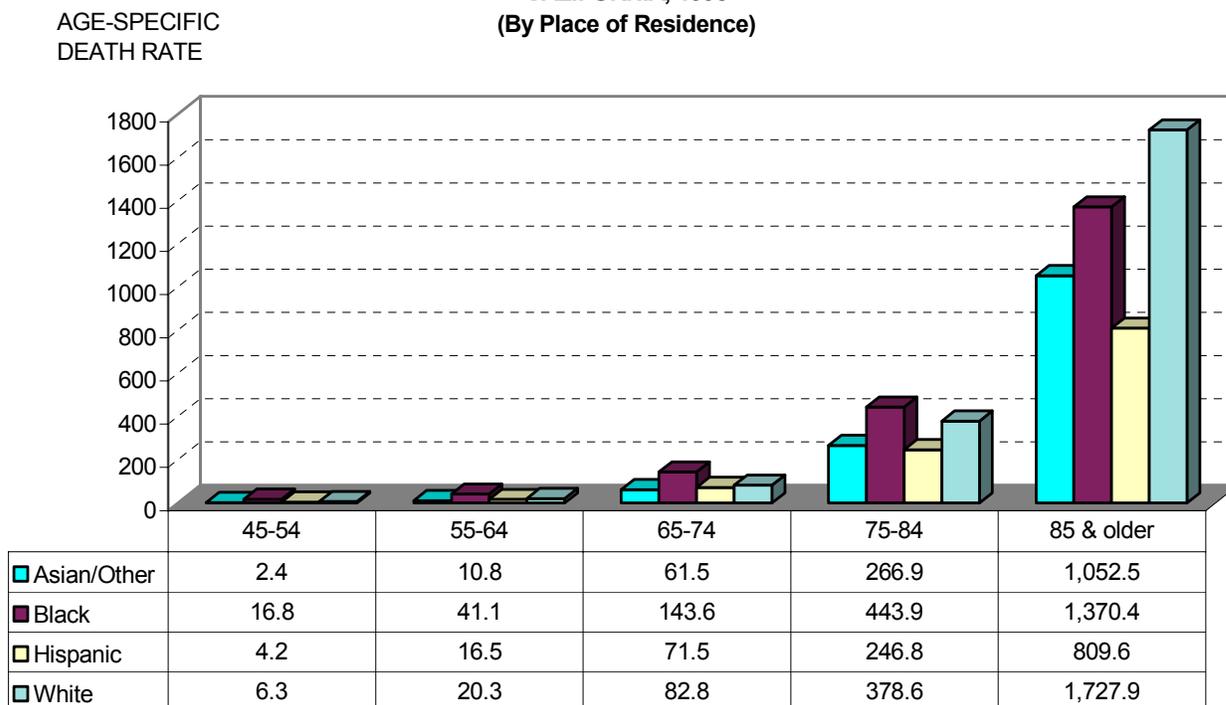
Pneumonia and Influenza Age-Specific Death Rates

For all races combined, the age-specific pneumonia-influenza death rates were significantly higher in the under 1 year group, and age groups 55 and over, with the highest rates being among the 85 and over group.

Where age-specific rates were reliable, the male rates were higher than female rates in all age groups. This pattern is opposite from the gender differences in the total crude death rates where females had higher crude death rates than males in all race/ethnic groups, except Asian/Others where the male rate was higher than the female rate.

None of the four race/ethnic groups had reliable age-specific death rates for pneumonia-influenza in the under 1 age group. Blacks had the highest rates in the 45-54, 55-64 and 65-74 age groups and Whites had the highest rates in the 75-84 and 85 and over age groups **(Figure 3).**

Figure 3
PNEUMONIA AND INFLUENZA AGE-SPECIFIC DEATH RATES
BY RACE/ETHNICITY AND AGE
CALIFORNIA, 1998
(By Place of Residence)

AGE-SPECIFIC
DEATH RATE

	45-54	55-64	65-74	75-84	85 & older
Asian/Other	2.4	10.8	61.5	266.9	1,052.5
Black	16.8	41.1	143.6	443.9	1,370.4
Hispanic	4.2	16.5	71.5	246.8	809.6
White	6.3	20.3	82.8	378.6	1,727.9

Source: Table 1

Pneumonia and Influenza Age-Adjusted Death Rates

In 1998 the national pneumonia and influenza age-adjusted death rate was 13.2 per 100,000 population.[2] The rate for California in 1998 was 17.5, up 4.6 percent from 16.7 in 1997.[7]

The difference in age-adjusted rates between males and females for the total population was statistically significant, the male rate being higher at 21.0 versus 15.1 for females.

Blacks had the highest age-adjusted death rates from pneumonia and influenza at 25.2, a statistically significant difference from Whites, the next highest at 18.6, followed by Hispanics and Asian/Others both at 12.4, again a statistically significant difference.

Male age-adjusted death rates were greater than those of females within all of the race/ethnic groups by statistically significant margins; the Black male/female age-adjusted rate differential was the highest and the White male/female differential was the lowest **(Figure 4)**.

Pneumonia and Influenza Death Rates among California Counties

Table 2 (page 8) displays the number of deaths, crude death rates, and age-adjusted death rates by county, averaged over a three-year period from 1996 to 1998.

Napa County had the highest reliable pneumonia and influenza <u>crude death rate</u> at 89.9 deaths per 100,000 population, and Imperial County had the lowest reliable crude death rate at 20.8.

However, the county with the highest reliable <u>age-adjusted death rate</u> was Stanislaus at 25.8 deaths per 100,000 population and the county with the lowest reliable age-adjusted rate was San Luis Obispo at 11.4 per 100,000 population.

Figure 4
PNEUMONIA AND INFLUENZA AGE- ADJUSTED DEATH RATES BY RACE/ETHNICITY AND SEX
CALIFORNIA, 1998
(By place of Residence)

	Total	Asian/Other	Black	Hispanic	White
□ Male	21.0	15.8	32.8	15.4	21.9
■ Female	15.1	9.7	20.1	10.0	16.3
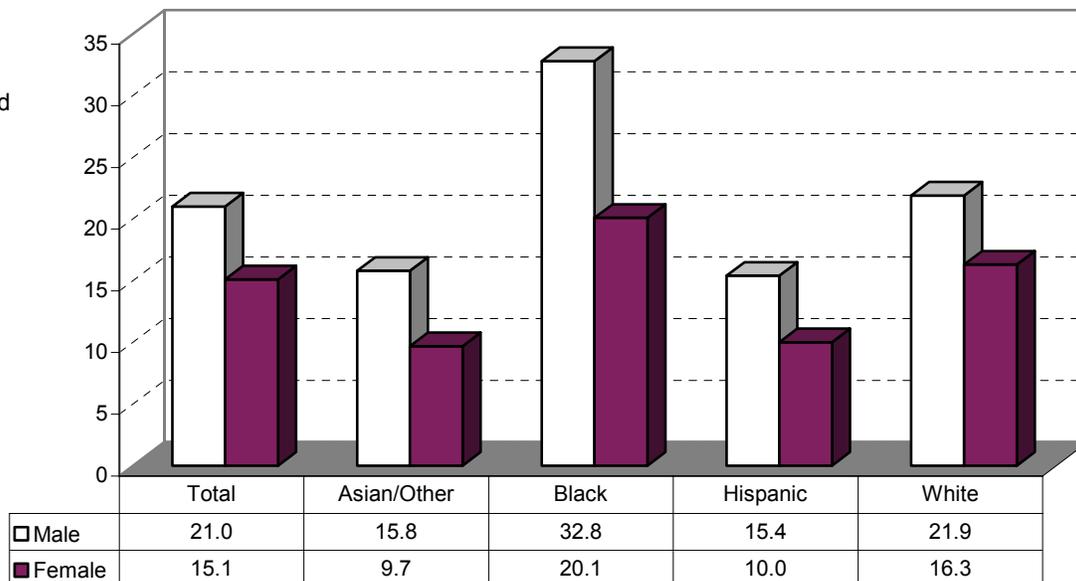
Source: Table 1

TABLE 3
DEATHS DUE TO PNEUMONIA AND INFLUENZA
AMONG THE CITY HEALTH DEPARTMENTS
CALIFORNIA, 1996-1998
(By Place of Residence)

CITY HEALTH DEPARTMENT	NUMBER OF DEATHS (Average)	1997 POPULATION	CRUDE DEATH RATE	95% CONFIDENCE LIMITS	
				LOWER	UPPER
BERKELEY	30.7	106,300	28.9	18.7	39.1
LONG BEACH	186.3	440,900	42.3	36.2	48.3
PASADENA	80.3	138,700	57.9	45.2	70.6

Note: Rates are per 100,000 population; ICD-9 codes 480-487.

Source: State of California, Department of Finance, City/County
Population Estimates with Annual Percent Change,
January 1, 1997 and 1998, May 1998.
State of California, Department of Health Services,
Death Records.

**Pneumonia and Influenza Death Data
by City Health Departments**

Table 3 shows the 1996-1998 three-year average death numbers and rates due to pneumonia and influenza for California's three city health departments. Among these city health departments, Berkeley had 30.7 average deaths due to pneumonia and influenza during 1996-1998, while Long Beach had 186.3 deaths and Pasadena had 80.3 deaths. The crude death rates due to pneumonia and influenza were 28.9 per 100,000 population in Berkeley, 42.3 in Long Beach, and 57.9 in Pasadena.

Age-adjusted death rates were not calculated for the city health departments because city population estimates by age are not available.

Technical Notes:

In accordance with the National Center for Health Statistics, the pneumonia and influenza death data presented in this report are ICD-9 codes 480-487.

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 substantial variation from one year to the next. Consequently, **Tables 2 and 3** present three-year annual average death data to increase the reliability of the data by county and local health jurisdiction. Also, 95 percent confidence intervals and an indicator, "*" (asterisk), denoting rates that have a relative standard error (coefficient of variation) greater than or equal to 23 percent are provided in the data tables as a tool for measuring the reliability of the death rates.

The four race/ethnic groups presented in Table 1 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.[8]

For a more complete explanation of the age-adjusting methodology, see the *Healthy People 2000 Statistical Notes* publication. 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*. 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].

The Department of Finance utilizes different methodologies in estimating the populations of cities versus counties, therefore the population data used to calculate the crude rates in **Table 3** differ from the population data used to calculate the crude rates in **Table 2.** Consequently, caution should be exercised when comparing the crude rates among the three city health departments to the rates among the 58 California counties**.**

References:

1. 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.

2. Murphy SL. Final Data for 1998. National vital statistics reports; vol 48 no. 11. Hyattsville, Maryland: National Center for Health Statistics. 2000.

3. Ficenec S. Advance Report: California Vital Statistics 1998. Center for Health Statistics, California Department of Health Services, February 2000.

4. See: The American Lung Association, *Fact Sheet* @ http://www.lungusa.org/diseases/ for more information on Pneumonia and Influenza.

5. See: Centers For Disease Control, FASTATS @ http://www.cdc.gov/nchswww/fastats/flu.htr for more information on Pneumonia and Influenza.

6. U.S. Department of Health and Human Services *Healthy People 2000*. Washington, D.C.: Public Health Service, DHHS Pub. No. (PHS) 91-50212, September 1991.

7. Richards F. Pneumonia and Influenza Deaths, California, 1997. *Data Summary*; No. DS00-03003. Center for Health Statistics, California Department of Health Services, March 2000.

8. 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.

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

AGE GROUPS	1998 DEATHS			POPULATION			AGE-SPECIFIC DEATH RATE			95% CONFIDENCE LIMITS					
										TOTAL		MALE		FEMALE	
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER
TOTAL															
Under 1	39	22	17	522,034	266,390	255,644	7.5	8.3	6.6*	5.1	9.8	4.8	11.7	3.5	9.8
1 to 4	14	7	7	2,211,332	1,131,193	1,080,139	0.6*	0.6*	0.6*	0.3	1.0	0.2	1.1	0.2	1.1
5 to 14	13	7	6	5,284,863	2,704,999	2,579,864	0.2*	0.3*	0.2*	0.1	0.4	0.1	0.5	0.0	0.4
15 to 24	23	15	8	4,356,208	2,258,544	2,097,664	0.5	0.7*	0.4*	0.3	0.7	0.3	1.0	0.1	0.6
25 to 34	42	23	19	5,208,869	2,758,217	2,450,652	0.8	0.8	0.8*	0.6	1.1	0.5	1.2	0.4	1.1
35 to 44	145	89	56	5,644,380	2,876,572	2,767,808	2.6	3.1	2.0	2.2	3.0	2.5	3.7	1.5	2.6
45 to 54	252	155	97	4,131,786	2,050,795	2,080,991	6.1	7.6	4.7	5.3	6.9	6.4	8.7	3.7	5.6
55 to 64	505	278	227	2,541,885	1,236,490	1,305,395	19.9	22.5	17.4	18.1	21.6	19.8	25.1	15.1	19.7
65 to 74	1,600	874	726	1,948,692	885,190	1,063,502	82.1	98.7	68.3	78.1	86.1	92.2	105.3	63.3	73.2
75 to 84	4,412	2,209	2,203	1,236,392	501,453	734,939	356.8	440.5	299.8	346.3	367.4	422.1	458.9	287.2	312.3
85 & Older	6,269	2,262	4,007	406,376	125,502	280,874	1,542.7	1,802.4	1,426.6	1,504.5	1,580.8	1,728.1	1,876.6	1,382.4	1,470.8
Unknown	2	1	1												
Total	13,316	5942	7374	33,492,817	16,795,345	16,697,472	39.8	35.4	44.2	39.1	40.4	34.5	36.3	43.2	45.2
Age-Adjusted							17.5	21.0	15.1	17.2	17.8	20.5	21.5	14.7	15.4
ASIAN/OTHER															
Under 1	5	3	2	59,298	30,720	28,578	8.4*	9.8*	7.0*	1.0	15.8	0.0	20.8	0.0	16.7
1 to 4	0	0	0	255,226	131,589	123,637	0.0	0.0	0.0	-	-	-	-	-	-
5 to 14	1	0	1	615,588	315,572	300,016	0.2*	0.0	0.3*	0.0	0.5	-	-	0.0	1.0
15 to 24	5	3	2	565,434	290,066	275,368	0.9*	1.0*	0.7*	0.1	1.7	0.0	2.2	0.0	1.7
25 to 34	5	5	0	626,348	316,425	309,923	0.8*	1.6*	0.0	0.1	1.5	0.2	3.0	-	-
35 to 44	12	8	4	670,617	323,636	346,981	1.8*	2.5*	1.2*	0.8	2.8	0.8	4.2	0.0	2.3
45 to 54	12	6	6	498,901	236,177	262,724	2.4*	2.5*	2.3*	1.0	3.8	0.5	4.6	0.5	4.1
55 to 64	31	17	14	286,259	135,484	150,775	10.8	12.5*	9.3*	7.0	14.6	6.6	18.5	4.4	14.1
65 to 74	125	78	47	203,383	88,240	115,143	61.5	88.4	40.8	50.7	72.2	68.8	108.0	29.1	52.5
75 to 84	291	160	131	109,047	46,367	62,680	266.9	345.1	209.0	236.2	297.5	291.6	398.5	173.2	244.8
85 & Older	342	166	176	32,493	13,822	18,671	1,052.5	1,201.0	942.6	941.0	1,164.1	1,018.3	1,383.7	803.4	1,081.9
Unknown	0	0	0												
Total	829	446	383	3,922,594	1,928,098	1,994,496	21.1	23.1	19.2	19.7	22.6	21.0	25.3	17.3	21.1
Age-Adjusted							12.4	15.8	9.7	11.5	13.2	14.4	17.3	8.7	10.6
BLACK															
Under 1	2	1	1	35,290	18,083	17,207	5.7*	5.5*	5.8*	0.0	13.5	0.0	16.4	0.0	17.2
1 to 4	2	0	2	157,434	79,976	77,458	1.3*	0.0	2.6*	0.0	3.0	-	-	0.0	6.2
5 to 14	2	1	1	414,292	209,767	204,525	0.5*	0.5*	0.5*	0.0	1.2	0.0	1.4	0.0	1.4
15 to 24	4	3	1	352,516	184,981	167,535	1.1*	1.6*	0.6*	0.0	2.2	0.0	3.5	0.0	1.8
25 to 34	4	1	3	386,096	201,122	184,974	1.0*	0.5*	1.6*	0.0	2.1	0.0	1.5	0.0	3.5
35 to 44	25	18	7	392,571	191,281	201,290	6.4	9.4*	3.5*	3.9	8.9	5.1	13.8	0.9	6.1
45 to 54	45	26	19	267,602	125,822	141,780	16.8	20.7	13.4*	11.9	21.7	12.7	28.6	7.4	19.4
55 to 64	67	35	32	163,032	76,090	86,942	41.1	46.0	36.8	31.3	50.9	30.8	61.2	24.1	49.6
65 to 74	151	84	67	105,180	45,362	59,818	143.6	185.2	112.0	120.7	166.5	145.6	224.8	85.2	138.8
75 to 84	259	148	111	58,348	21,889	36,459	443.9	676.1	304.5	389.8	497.9	567.2	785.1	247.8	361.1
85 & Older	245	79	166	17,878	5,270	12,608	1,370.4	1,499.1	1,316.6	1,198.8	1,542.0	1,168.5	1,829.6	1,116.3	1,516.9
Unknown	1	0	1												
Total	807	396	411	2,350,239	1,159,643	1,190,596	34.3	34.1	34.5	32.0	36.7	30.8	37.5	31.2	37.9
Age-Adjusted							25.2	32.8	20.1	23.5	27.0	29.6	36.0	18.1	22.0
HISPANIC															
Under 1	14	8	6	247,713	125,675	122,038	5.7*	6.4*	4.9*	2.7	8.6	2.0	10.8	1.0	8.9
1 to 4	7	5	2	1,024,463	522,147	502,316	0.7*	1.0*	0.4*	0.2	1.2	0.1	1.8	0.0	0.9
5 to 14	3	2	1	2,054,172	1,048,592	1,005,580	0.1*	0.2*	0.1*	0.0	0.3	0.0	0.5	0.0	0.3
15 to 24	6	4	2	1,494,249	771,494	722,755	0.4*	0.5*	0.3*	0.1	0.7	0.0	1.0	0.0	0.7
25 to 34	10	9	1	1,820,094	1,021,495	798,599	0.5*	0.9*	0.1*	0.2	0.9	0.3	1.5	0.0	0.4
35 to 44	30	22	8	1,503,414	797,133	706,281	2.0	2.8	1.1*	1.3	2.7	1.6	3.9	0.3	1.9
45 to 54	36	25	11	848,771	429,818	418,953	4.2	5.8	2.6	2.9	5.6	3.5	8.1	1.1	4.2
55 to 64	75	44	31	454,852	220,075	234,777	16.5	20.0	13.2	12.8	20.2	14.1	25.9	8.6	17.9
65 to 74	214	123	91	299,470	135,955	163,515	71.5	90.5	55.7	61.9	81.0	74.5	106.5	44.2	67.1
75 to 84	347	173	174	140,610	57,195	83,415	246.8	302.5	208.6	220.8	272.7	257.4	347.5	177.6	239.6
85 & Older	414	172	242	51,135	17,548	33,587	809.6	980.2	720.5	731.6	887.6	833.7	1,126.7	629.7	811.3
Unknown	0	0	0												
Total	1,156	587	569	9,938,943	5,147,127	4,791,816	11.6	11.4	11.9	11.0	12.3	10.5	12.3	10.9	12.9
Age-Adjusted							12.4	15.4	10.0	11.7	13.1	14.2	16.7	9.2	10.8
WHITE															
Under 1	18	10	8	179,733	91,912	87,821	10.0*	10.9*	9.1*	5.4	14.6	4.1	17.6	2.8	15.4
1 to 4	5	2	3	774,209	397,481	376,728	0.6*	0.5*	0.8*	0.1	1.2	0.0	1.2	0.0	1.7
5 to 14	7	4	3	2,200,811	1,131,068	1,069,743	0.3*	0.4*	0.3*	0.1	0.6	0.0	0.7	0.0	0.6
15 to 24	8	5	3	1,944,009	1,012,003	932,006	0.4*	0.5*	0.3*	0.1	0.7	0.1	0.9	0.0	0.7
25 to 34	23	8	15	2,376,331	1,219,175	1,157,156	1.0	0.7*	1.3*	0.6	1.4	0.2	1.1	0.6	2.0
35 to 44	78	41	37	3,077,778	1,564,522	1,513,256	2.5	2.6	2.4	2.0	3.1	1.8	3.4	1.7	3.2
45 to 54	159	98	61	2,516,512	1,258,978	1,257,534	6.3	7.8	4.9	5.3	7.3	6.2	9.3	3.6	6.1
55 to 64	332	182	150	1,637,742	804,841	832,901	20.3	22.6	18.0	18.1	22.5	19.3	25.9	15.1	20.9
65 to 74	1,110	589	521	1,340,659	615,633	725,026	82.8	95.7	71.9	77.9	87.7	87.9	103.4	65.7	78.0
75 to 84	3,515	1,728	1,787	928,387	376,002	552,385	378.6	459.6	323.5	366.1	391.1	437.9	481.2	308.5	338.5
85 & Older	5,268	1,845	3,423	304,870	88,862	216,008	1,727.9	2,076.3	1,584.7	1,681.3	1,774.6	1,981.5	2,171.0	1,531.6	1,637.8
Unknown	1	1	0												
Total	10,524	4,513	6,011	17,281,041	8,560,477	8,720,564	60.9	52.7	68.9	59.7	62.1	51.2	54.3	67.2	70.7
Age-Adjusted							18.6	21.9	16.3	18.2	18.9	21.3	22.5	15.9	16.7

Note : Rates are per 100,000 population. ICD-9 codes 480-487.
    White, Black, and Asian/Other exclude Hispanic ethnicity. Hispanic includes any race category.
Source : State of California, Department of Finance, 1998 County Race/Ethnic Population Estimates
    with Age and Sex Detail, May 2000. State of California, Department of Health Services, Death Records.

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

TABLE 2
DEATHS DUE TO PNUMONIA AND INFLUENZA BY COUNTY
CALIFORNIA, 1996-1998
(By Place of Residence)

COUNTY	1996-1998 DEATHS (Average)	PERCENT	1997 POPULATION	CRUDE RATE	AGE-ADJUSTED RATE	95% CONFIDENCE LIMITS	
						LOWER	UPPER
CALIFORNIA	12,245.3	100.0	32,956,695	37.2	16.7	16.3	17.0
ALAMEDA	495.7	4.0	1,398,421	35.4	16.3	14.6	17.9
ALPINE	0.3	a	1,174	28.4*	22.7*	0.0	99.9
AMADOR	18.3	0.1	33,472	54.8	15.2*	6.5	23.9
BUTTE	111.7	0.9	198,459	56.3	14.9	11.1	18.7
CALAVERAS	15.0	0.1	37,916	39.6*	12.9*	2.8	23.0
COLUSA	4.7	a	18,530	25.2*	10.3*	0.0	21.8
CONTRA COSTA	313.3	2.6	896,206	35.0	14.6	12.8	16.4
DEL NORTE	16.0	0.1	28,413	56.3*	22.4*	9.3	35.5
EL DORADO	54.3	0.4	147,409	36.9	15.1	10.4	19.8
FRESNO	253.7	2.1	778,674	32.6	15.1	12.9	17.3
GLENN	9.0	0.1	26,856	33.5*	14.2*	2.4	25.9
HUMBOLDT	46.0	0.4	126,137	36.5	14.5	9.5	19.6
IMPERIAL	29.7	0.2	142,759	20.8	12.2	7.2	17.1
INYO	10.3	0.1	18,272	56.6*	10.3*	2.9	17.6
KERN	253.7	2.1	634,404	40.0	21.3	18.3	24.3
KINGS	25.7	0.2	117,793	21.8	14.7	8.3	21.0
LAKE	44.7	0.4	55,047	81.1	21.5	13.2	29.7
LASSEN	9.7	0.1	33,861	28.5*	12.2*	3.3	21.0
LOS ANGELES	3,308.0	27.0	9,524,613	34.7	16.9	16.2	17.5
MADERA	39.0	0.3	113,525	34.4	16.8	10.8	22.9
MARIN	120.0	1.0	243,214	49.3	16.1	12.7	19.4
MARIPOSA	9.7	0.1	15,957	60.6*	13.5*	4.1	22.9
MENDOCINO	44.0	0.4	85,966	51.2	19.4	12.5	26.2
MERCED	69.7	0.6	201,905	34.5	19.4	14.3	24.5
MODOC	9.0	0.1	10,140	88.8*	22.2*	3.2	41.3
MONO	1.3	a	10,531	12.7*	7.6*	0.0	21.9
MONTEREY	107.3	0.9	377,744	28.4	14.2	11.1	17.3
NAPA	109.0	0.9	121,239	89.9	21.6	16.4	26.7
NEVADA	53.3	0.4	88,356	60.4	16.1	10.3	21.8
ORANGE	905.0	7.4	2,705,313	33.5	16.2	15.1	17.4
PLACER	101.0	0.8	215,634	46.8	18.0	14.0	22.0
PLUMAS	9.3	0.1	20,402	45.7*	13.8*	3.0	24.7
RIVERSIDE	493.3	4.0	1,423,699	34.7	13.6	12.1	15.1
SACRAMENTO	620.3	5.1	1,146,825	54.1	24.9	22.7	27.1
SAN BENITO	14.7	0.1	46,121	31.8*	13.4*	5.2	21.6
SAN BERNARDINO	464.3	3.8	1,617,262	28.7	16.7	15.0	18.4
SAN DIEGO	997.3	8.1	2,763,401	36.1	15.7	14.6	16.9
SAN FRANCISCO	459.0	3.7	777,368	59.0	17.4	15.4	19.4
SAN JOAQUIN	196.7	1.6	542,196	36.3	16.4	13.6	19.1
SAN LUIS OBISPO	80.3	0.7	234,813	34.2	11.4	8.3	14.6
SAN MATEO	328.3	2.7	711,699	46.1	17.0	14.8	19.1
SANTA BARBARA	127.7	1.0	400,751	31.9	11.6	9.1	14.1
SANTA CLARA	557.7	4.6	1,671,414	33.4	17.8	16.2	19.5
SANTA CRUZ	99.3	0.8	247,216	40.2	14.8	11.2	18.4
SHASTA	101.7	0.8	163,351	62.2	23.0	17.7	28.3
SIERRA	2.3	a	3,406	68.5*	15.1*	0.0	43.1
SISKIYOU	25.3	0.2	44,186	57.3	19.9*	10.2	29.7
SOLANO	103.3	0.8	378,664	27.3	16.5	13.1	20.0
SONOMA	208.0	1.7	432,771	48.1	16.2	13.5	18.9
STANISLAUS	230.0	1.9	425,407	54.1	25.8	22.0	29.7
SUTTER	33.7	0.3	76,004	44.3	19.2	11.6	26.7
TEHAMA	27.7	0.2	54,702	50.6	16.5*	8.6	24.4
TRINITY	6.3	0.1	13,230	47.9*	13.3*	1.7	24.9
TULARE	134.7	1.1	358,337	37.6	19.0	15.2	22.8
TUOLUMNE	25.3	0.2	52,280	48.5	14.1*	7.0	21.2
VENTURA	210.0	1.7	727,154	28.9	14.4	12.2	16.6
YOLO	75.0	0.6	154,850	48.4	23.6	17.4	29.8
YUBA	25.7	0.2	61,246	41.9	22.3	12.5	32.1

Note : Rates are per 100,000 population. ICD-9 codes 480-487.
 * 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 1997 Population Estimates for Counties with
 Age and Sex Detail. December 1998.
 State of California, Department of Health Services, Death Records.