SECTION IV.

CAUSE OF DEATH
GROUPINGS

CONTENTS

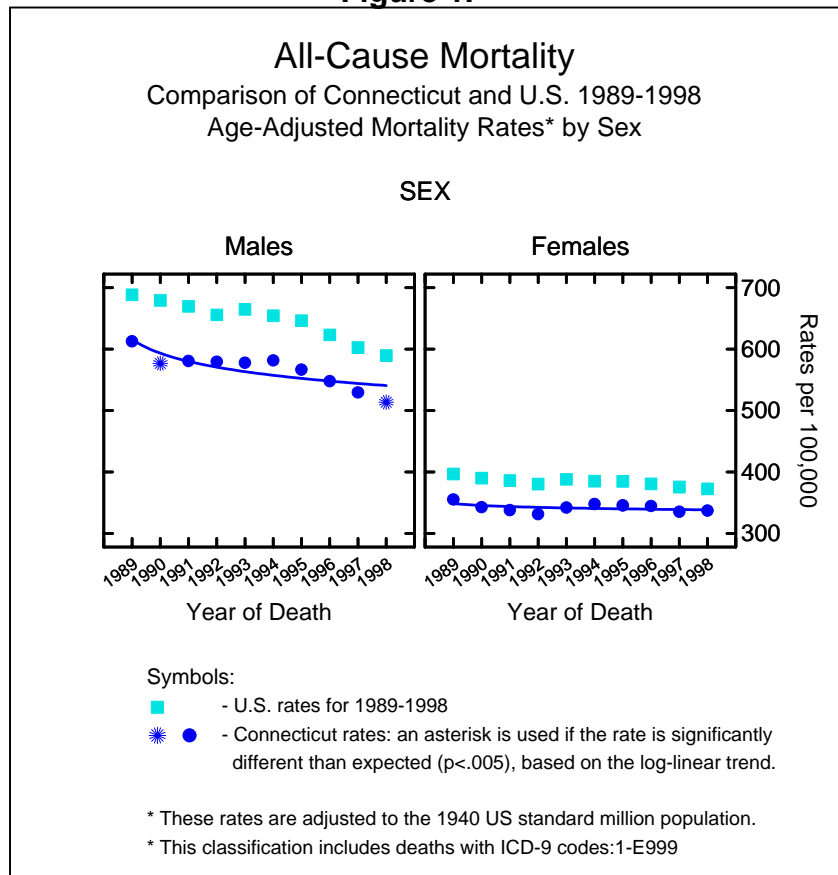# All Cause Mortality
(ICD-9 codes 001-E999)

During the 1989 to 1998 period in Connecticut, age-adjusted mortality rates due to all causes of death were consistently lower for both Connecticut male and female residents compared with the respective national figures (Figure 1). Although Connecticut does fare well in comparison with the nation, the age-adjusted all-cause mortality rate of Connecticut residents was significantly higher than the *Healthy Connecticut* target objective during this period (Table 1).

Almost 70% of all deaths among Connecticut residents for the ten-year period were due to cardiovascular diseases or cancer. Other major categories of death included injury, which accounted for about 5%, and pneumonia and influenza, and chronic obstructive pulmonary disease (COPD), which each accounted for about 4% of deaths (Figure 2).

Between the 1989-1991 and 1996-1998 periods, age-adjusted mortality rates for all causes decreased significantly for male but remained about the same for female residents of Connecticut. This trend is consistent with national data. The average annual decrease in male mortality was approximately 1.4% (p< .001) from 1989 to 1998. This

Figure 1.

All-Cause Mortality
Comparison of Connecticut and U.S. 1989-1998
Age-Adjusted Mortality Rates* by Sex

SEX

Males   Females

Rates per 100,000

Year of Death   Year of Death

Symbols:
- U.S. rates for 1989-1998
- Connecticut rates: an asterisk is used if the rate is significantly different than expected (p<.005), based on the log-linear trend.

* These rates are adjusted to the 1940 US standard million population.
* This classification includes deaths with ICD-9 codes:1-E999

decrease is accounted for by significant decreases in mortality within the white and black male resident populations. Age-adjusted rates of years of potential life lost (YPLL), a measure of premature mortality, decreased significantly for both men and women between the two time periods. The decrease in premature mortality among males is accounted for by significant decreases within the white and black male resident populations (Table 2).
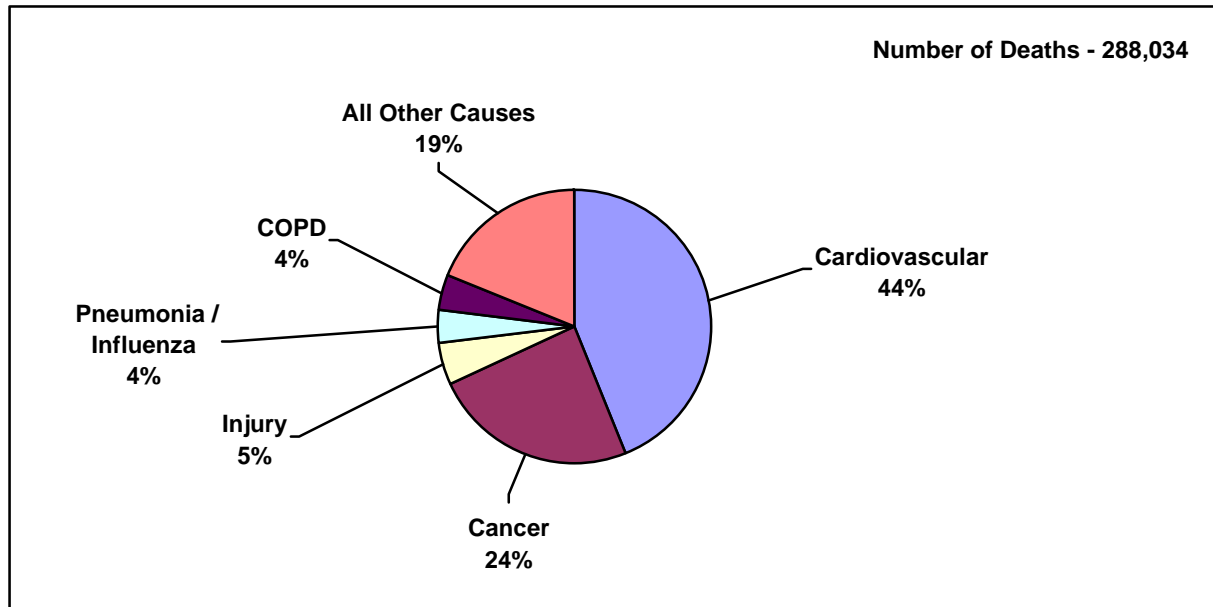
**Table 1. All-Cause Age-Adjusted Death Rates,
Comparison of CT with US - 1989 and 1998**

	1989	1998	1998 CT AAMR Comparison
CT AAMR*	468.2	416.9	
US AAMR*	527.3	471.7	CT AAMR < US AAMR
*Healthy CT 2000**	328.4	328.4	CT AAMR > *HCT2000* rate

* age-adjusted mortality rates are per 100,000 population, U.S. 1940 standard million population.

**Figure 2. All Mortality, Percent by Cause
Connecticut Residents, 1989-1998**

Number of Deaths - 288,034

All Other Causes 19%
COPD 4%
Pneumonia / Influenza 4%
Injury 5%
Cancer 24%
Cardiovascular 44%

Gender differences in age-adjusted, all-cause mortality rates were consistently large during this time period. Male all-cause mortality rates were about 1.6 times higher than female rates in the 1989-1991 period and 1.5 times higher in the 1996-1998 period (differences were statistically significant at p < .001 during both periods). During the latter period, premature mortality (YPLL) among males was about 1.7 times higher than that of females (p < .001) [Table 2]. The male-female differential in mortality is consistent with comparable national figures and data from other industrialized countries (Wingard 1982, 1984; Waldron 1986, 1995a, 1995b; Nathanson 1990, 1995;

Hemstrom 1998; Nikiforov and Mamaev 1998). The Summary Section of this report contains a detailed discussion of gender differences in mortality.

Age-adjusted, all-cause mortality rates differed among racial and ethnic subgroups in the state (Table 2). For the period 1996-1998, male all-cause, age-adjusted mortality was highest among black residents, followed by white, Native American, Hispanic, and Asian and Pacific Islander residents. The all-cause mortality rate of black males was significantly higher than that of white males. All-cause mortality rates for Hispanic and Asian and Pacific Islander males were significantly lower than the white male rate. The all-cause mortality rate of Native American males was not significantly different from the respective white male rate. Female all-cause mortality was highest among black, followed by white, Hispanic, Native American, and Asian and Pacific Islander female residents for the period 1996-1998. During this period, black females had significantly higher, whereas Hispanic, Native American, and Asian and Pacific Islander females had significantly lower, mortality rates compared with white females (Table 2).

The disparity in black-white and Hispanic-white male all-cause mortality (1996-1998 period) differed by age group (p < .0014). For black compared with white males under age 65, the relative risk of death was consistent at 2.3 (p < .001), while the disparity for black compared with white males aged 65-84 lessened. Among males aged 85 and over, the all-cause mortality rate was significantly lower for blacks compared with whites. For Hispanic compared with white males under age 60, the relative risk of all-cause mortality was consistent at 1.5 (p < .001). There were no significant differences in all-cause mortality for Hispanic and white males aged 60-74. The disparity reversed for those aged 75 and over, with Hispanic males at significantly less risk of death due to all causes compared with white males.

The disparity in black-white and Hispanic-white female all-cause mortality (1996-1998 period) differed by age group (p < .0014). For black compared with white females under age 65, the relative risk of death was consistent at 2.0 (p < .001), while the disparity for black compared with white females aged 65-84 lessened. Among females aged 85 and over, the all-cause mortality rate was significantly lower for blacks compared with whites. Hispanic females have significantly lower mortality than white females (RR=0.7, p < .001 for all ages) and this difference is fairly consistent across age groups with a few exceptions. Hispanic females ages 40-44 have a significantly greater all-cause mortality rate than white females and Hispanic females aged 80 and over have a substantially lower mortality rate than their white counterparts.

Premature mortality (YPLL) rates present a slightly different pattern by race and ethnicity. Age-adjusted, all cause YPLL rates were significantly higher for black and Hispanic male residents but lower for Asian and Pacific Islander males compared with white male resident rates during the 1996-1998 period. Although Hispanic males had significantly lower age-adjusted all-cause mortality rates compared with whites, they had significantly higher *premature* mortality rates. The age-adjusted YPLL rate of Native American males was not significantly different from the respective white male rate. Between the period 1989-1991 and 1996-1998, all-cause mortality rates and premature mortality rates decreased significantly for both white and black males. Rates for the other population subgroups during this time period remained about the same (Table 2).

**Table 2. All Causes of Death[1], Connecticut Residents
by Gender, Race and Ethnicity[2], 1996-1998**

Group	Number of Deaths	Age-Adjusted Mortality Rates[3]		Age-Adjusted Premature Mortality Rates to Age 75[3]	
		AAMR[4]	Change since 1989-91[5]	YPLL[4]	Change since 1989-91[5]
All Residents	88,566	815.1	↓↓↓	6,648.1	↓↓↓
All males	42,173	999.0	↓↓↓	8,386.5	↓↓↓
White	38,650	978.0	↓↓↓	7,555.8	↓↓↓
Black	3,118	1,270.9***	↓↓↓	17,041.0***	↓↓↓
Asian PI	171	374.2***	ns	3,072.6***	ns
Native American	56	761.8	ns	10,907.3	ns
Hispanic	1,351	729.3***	ns	10,202.2***	ns
All females	46,393	684.3	ns	4,972.6	↓
White	43,320	671.4	ns	4,524.0	ns
Black	2,780	846.9***	ns	9,236.4***	ns
Asian PI	141	259.1***	ns	2,149.7***	ns
Native American	34	356.1***	ns	4,895.8	ns
Hispanic	934	434.7***	ns	4,910.9	ns

Notes:

1. This cause of death category includes ICD-9 codes 001-E999.

2. Racial groupings (White, Black, Asian & Pacific Islander, Native American) include persons of Hispanic ethnicity.

3. Age-adjusted Mortality Rates (AAMR) and Years of Potential Life Lost (YPLL) rates are per 100,000 based on race and ethnicity specific population estimates. Age-adjusted rates were calculated by the direct method using the 2000 U.S. standard population. Rates were not calculated for fewer than 15 events.

4. Statistical tests were conducted to evaluate differences in rates between race/ethnic groups. The white population serves as the reference group in each comparison (black vs. white, Asian & PI vs. white, Native American vs. white, Hispanic vs. white). Following are explanations of the notations:

   *** Significantly different than the respective white resident rate at $p < .001$.

5. Statistical tests were conducted to evaluate changes in rates over time. Comparisons of 1996-98 vs. 1989-91 rates are made within each race/ethnicity group. Following are explanations of the notations:

   ↓   1996-98 rate is significantly lower than the 1989-91 rate at $p < .05$.
   ↓↓↓ 1996-98 rate is significantly lower than the 1989-91 rate at $p < .001$.
   ns   Indicates the change from 1989-91 to 1996-98 is not statistically significant.

Premature mortality was significantly higher among black and significantly lower among Asian and Pacific Islander females compared with white females during the 1996-1998 period. There were no significant differences in premature mortality of Hispanic and Native American females compared with white females during this period. Age-adjusted death and premature mortality rates within these female subgroups did not change significantly between the two time periods (Table 2). A comprehensive discussion of racial and ethnic differences in mortality appears in the Summary Section of this report.

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