

National Institute on Alcohol Abuse and Alcoholism
Division of Biometry and Epidemiology
Alcohol Epidemiologic Data System

SURVEILLANCE REPORT #57

**LIVER CIRRHOSIS MORTALITY IN
THE UNITED STATES, 1970–98**

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HIGHLIGHTS

This surveillance report published by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) presents trends in liver cirrhosis mortality in the United States. Data on the underlying cause of death were compiled from public use data tapes published annually by the National Center for Health Statistics (NCHS). Overall cirrhosis mortality in the United States increased steadily following the end of Prohibition in 1933 until 1973, when the age-adjusted death rates peaked at 14.9 deaths per 100,000 population. Cirrhosis mortality then began a steady decline that has continued through 1998, the most recent year for which data are available. The following are highlights of liver cirrhosis mortality trends from the early 1970s through 1998:

Unadjusted Death Rates

- Unadjusted death rates from all liver cirrhosis dropped by 39.0 percent, from 15.4 deaths per 100,000 population in 1970 to 9.4 deaths per 100,000 population in 1998. This decrease was consistent for the race-sex groups considered.
- Unadjusted death rates from alcohol-related liver cirrhosis dropped by 20.0 percent, from 5.5 deaths per 100,000 population in 1970 to 4.4 deaths per 100,000 population in 1998.

Age-Adjusted Death Rates

- Age-adjusted death rates from all liver cirrhosis dropped by 50.7 percent, from 14.6 deaths per 100,000 population in 1970 to 7.2 deaths per 100,000 population in 1998. The decline in the rates was consistent for each race-sex group, except that rates for black females dropped by 73.4 percent and for black males by 62.3 percent.
- Age-adjusted death rates from all liver cirrhosis for males were consistently more than 2 times the rates for females regardless of race.
- Age-adjusted death rates from alcohol-related liver cirrhosis dropped by 31.5 percent, from 5.4 deaths per 100,000 population in 1970 to 3.7 deaths per 100,000 population in 1998. This pattern was consistent for all race-sex groups considered. The degree of decline was greater for females than for males, regardless of race.
- In 1998 age-adjusted death rates from all liver cirrhosis were more than 2 times as high for Hispanic white males as for non-Hispanic white males and 1.6 times the rate for non-Hispanic black males. Age-adjusted death rates from all liver cirrhosis were 1.4 times as high for Hispanic white females as for non-Hispanic white females.

Age-Specific Death Rates

- From 1970 through 1998, age-specific death rates from liver cirrhosis decreased among decedents ages 25 to 74; however, over this same period there were fluctuations in cirrhosis mortality rates that showed slight increases among decedents ages 75 and older.

INTRODUCTION

This surveillance report on liver cirrhosis is one of a series of four reports published annually to monitor trends in alcohol consumption and alcohol-related morbidity and mortality in the United States. These surveillance reports are prepared by the Alcohol Epidemiologic Data System (AEDS), Division of Biometry and Epidemiology (DBE), NIAAA, and are intended to be useful

to researchers, policymakers, and other professionals interested in alcohol abuse and its long-term effects. The data also are essential in assessing changes toward meeting the Nation's health promotion and disease prevention objective to reduce liver cirrhosis mortality by 34 percent over the years from 1987 to 2000 (Department of Health and Human Services [DHHS] 1991).

Background

Cirrhosis of the liver is an outcome of a variety of causes including alcohol consumption, exposure to various drugs and toxic chemicals, viral hepatitis, and other viral and infectious diseases (Dufour et al. 1993). Based on a literature review, it has been estimated that alcohol consumption is a major contributor in 41 to 95 percent of deaths from cirrhosis and the related condition of alcoholic hepatitis (Day 1977). Based on these percentages, in 1998 from 10,374 to 24,038 cirrhosis deaths may be attributed to excessive alcohol use.

The level and duration of alcohol consumption are important determinants in the development of liver pathology. Being the primary site for detoxification of alcohol by oxidation to its metabolites, the liver can undergo the following pathologies: fatty liver, alcoholic hepatitis, and cirrhosis. The prognosis for patients with cirrhosis is highly unpredictable. Although some patients can benefit from a liver transplant, no method currently exists for repairing liver damage associated with cirrhosis. However, the consequences of this disease can be treated, and life can be prolonged, if patients with cirrhosis resulting from alcohol consumption abstain from further alcohol use. Thus, early detection and prevention of further damage are important in prolonging life.

The coding scheme used in the United States to classify cause of death is the International Classification of Diseases (ICD), a statistical classification of disease and injury widely used by countries supporting mortality reporting systems. ICD codes allow the cause of death from cirrhosis to be related to alcohol or not related to alcohol. Because some stigma still exists for excessive alcohol use, physicians and other officials who certify causes of death might not identify alcohol in the case of a death from cirrhosis, feeling they are protecting family members. From 1970 through 1998, anywhere from 6 to 70 percent (depending on year and age group) of all cirrhosis deaths were coded as alcohol-related,

even though some researchers believe alcohol may contribute to up to 95 percent of all deaths from cirrhosis (Powell and Klatskin, 1968). For this reason, this surveillance report examines all cirrhosis deaths, as well as those that are explicitly coded as alcohol-related.

Sources and Limitations of Data

Death counts and rates in this report are based on a single underlying cause for each death, defined as “the disease or injury which initiated the train of morbid events leading directly or indirectly to death or circumstances of the accident or violence which produced the fatal injury” (National Center for Health Statistics 1982). This approach is straightforward and consistent with other mortality statistics reported by NCHS.

For 1970 through 1998 cirrhosis death records were extracted from public use mortality computerized data files produced by NCHS. With the exception of data files for 1972, these files contain individual records for each death occurring in the United States; in 1972 the files contained a 50-percent sample of all U.S. deaths. The deaths counted in this report are for U.S. residents only; deaths of foreign residents in the United States are not counted. Mortality statistics for the years 1910 through 1969 were taken from special reports published by NCHS, as summarized and described in an NIAAA data reference manual on cirrhosis mortality (NIAAA 1985). These reports were prepared from numbers obtained through States’ death registration offices. Prior to 1933 not all States collected death registration information. The changing number of death registration States impedes the process of obtaining comparable mortality data for the United States prior to 1933.

Population data used in calculating the rates for 1970, 1980, and 1990 come from the Decennial Census enumerations conducted during those 3 years. For other years in the three decades reported here, population data come from intercensal estimates developed by the U.S. Bureau of the Census.

Definitions and Subclassifications of Liver Cirrhosis

During the period for which mortality statistics are shown in this report, cause of death was classified according to eight different revisions of what is now the ICD. The ICD is revised periodically to reflect progress in medical knowledge, with later revisions generally providing greater specificity of coding.

The eighth (National Center for Health Statistics 1968) and ninth (World Health Organization 1978) revisions of the ICD (introduced in 1968 and 1979, respectively) provide for coding categories of cirrhosis with and without mention of alcohol. The eighth revision, abbreviated “ICDA-8,” was specially adapted for use in the United States. The ninth revision, ICD-9, uses categories for cirrhosis different from those of the ICDA-8. To examine trends for comparable diseases from 1970 through 1998, ICD-9 categories must be matched and recoded to those consistent with ICDA-8 categories. The relevant crosswalk, developed by AEDS staff in collaboration with NIAAA’s DBE (Colliver et al. 1984), is shown in the table below. In this report, all data for cirrhosis subclassifications are identified by ICDA-8 categories. As can be seen under ICD-

9 in the crosswalk table, AEDS includes portal hypertension (ICD 572.3) among cirrhosis deaths. Because NCHS counts only ICD 571 under the ICD-9 version, NCHS’s numbers are slightly smaller than those reported by AEDS.

Race or Ethnicity of Decedent

Data are presented in this report by white and black race categories, with other races such as American Indian/Alaska Native and Asian/Pacific Islander included in the “all races” category but not shown separately. Vital statistics data also provide information on the ethnicity of decedents (i.e., Mexican, Puerto Rican, Cuban, Central or South American, other or unknown Hispanic, or non-Hispanic). For the third year, this surveillance report on cirrhosis mortality presents data on black and white decedents of Hispanic and non-Hispanic origin.

The first year in which all 50 States and the District of Columbia included Hispanic origin of decedents on their death certificates was 1997. In 1998 only 0.5 percent of cirrhosis decedents had an “unknown” classification for Hispanic origin. For this report, trend data on Hispanic origin begin with 1991. From 1991 through 1998 the percentage of cirrhosis cases with Hispanic origin unknown has been less

Crosswalk of ICD-9 codes to ICDA-8 codes

ICD-9	ICDA-8
571.0 Alcoholic fatty liver 571.1 Acute alcoholic hepatitis 571.2 Alcoholic cirrhosis of the liver 571.3 Alcoholic liver damage, unspecified	571.0 Alcohol-related liver cirrhosis
571.4 Chronic hepatitis 571.6 Biliary cirrhosis 571.8 Other chronic nonalcoholic liver disease 572.3 Portal hypertension	571.8 Specified liver cirrhosis without mention of alcohol
571.5 Cirrhosis of the liver without mention of alcohol 571.9 Unspecified chronic liver disease without mention of alcohol	571.9 Unspecified liver cirrhosis without mention of alcohol

than 2 percent for both black and white decedents. In 1990 2.5 percent of white decedents and 5.5 percent of black decedents were of unknown Hispanic origin and these percentages are greater in earlier years. The tables and figures showing data based on Hispanic origin exclude decedents for whom Hispanic origin could not be determined.

METHODS

Simple statements of disease frequency, expressed as the number of deaths due to liver cirrhosis, have little epidemiologic usefulness because such information does not permit either comparisons of mortality among various population subgroups or the description of trends over time. For common epidemiologic purposes, death rates are used to compare the frequency of death from a disease or condition. The following measures of disease frequency are used in this report to assess trends in liver cirrhosis mortality:

- *Unadjusted (or crude) death rates.*—Unadjusted (or crude) death rates are summary measures calculated by dividing the total number of deaths due to cirrhosis (or subcategories) in the population in a certain year by the total number of individuals in that population in that year (i.e., population at risk). Problems can arise when comparing crude rates between various years to assess any change in mortality over time, because the populations at risk may be different with respect to an underlying characteristic such as age, race, or sex. For example, an older population tends to have a higher rate of death for a target disease than does a younger population because death from disease is more common in an aging population. In this case, comparisons of rates in different populations should be assessed by comparing age-specific rates or age-adjusted rates.
- *Age-specific death rates.*—Age-specific death rates refer to the number of deaths due to liver cirrhosis (or subcategories) in a defined age interval for a given year, divided by the total number of persons in

that age interval in that year. For a given age interval, examining age-specific rates for various years allows comparison of mortality rates among subgroups of the population that do not differ in their age distribution. Age-specific rates also provide a basis for detailed study of the variation of mortality rates among different age intervals in any one year.

- *Age-adjusted death rates.*—Age-adjusted death rates are statistically constructed summary rates that account for differences in mortality regardless of any difference in the age distribution between populations. Age adjustment assumes that populations have the same age distribution and applies a standard age distribution to calculate age-adjusted rates for various populations. Therefore, when comparing age-adjusted rates of two populations, any differences between the rates can no longer be due to the difference in the age distribution between the two populations. Age adjustment is especially crucial for standardizing rates over many years because the U.S. population has been growing progressively older in recent decades; without age adjustment, any apparent increases in unadjusted mortality rates for cirrhosis (or any other disease) could be caused by the fact that older people are more likely to die from disease.

Age-adjusted death rates presented in this report were computed by using 10-year age intervals of the enumerated population of the United States in 1940 as the standard population. The choice of the 1940 population as a standard is an arbitrary and historical convention that allows for meaningful comparison of similar rates published from many different sources. The basic procedure involves finding the expected number of deaths that would have existed if the age-specific rates for a particular year prevailed in a population whose age distribution¹ was like that of the United States in 1940. This was accomplished by multiplying the specific rates for each age group by the population for the corresponding age group in the standard

population. The age-adjusted mortality rate was calculated by adding the expected deaths for each age group and then dividing this sum by the total population taken as the standard.

RESULTS

This surveillance report provides an overview of trends in liver cirrhosis by sex from 1910 through 1998. Data on the subcategories of liver cirrhosis by sex, age, and race are presented for 1970 through 1998 and by sex, age, race, and Hispanic origin for 1991 through 1998. Overall, trends from 1970 through 1998 can be characterized as beginning high, peaking in the early 1970s, and then decreasing over time. Discussion of trends in the last three decades will focus on decreases from 1970, which will serve as a baseline for all observed changes. Detailed data supporting the findings discussed here are shown in four tables in the Appendix. These tables provide data on (1) the trends in death rates from liver cirrhosis between 1910 and 1998; (2) the number of deaths, crude-death rates, age-specific death rates, and age-adjusted death rates from liver cirrhosis by race and sex over 29 years beginning in 1970, including Hispanic origin over 8 years beginning in 1991; and (3) the number of deaths, age-specific death rates, and age-adjusted deaths from alcohol-related, specified, and unspecified liver cirrhosis during 29 years beginning in 1970.

Historical Perspective, 1910–98

Figure 1 and table 1 show the history of age-adjusted liver cirrhosis mortality rates by

sex in the United States from 1910 through 1998. The figure shows that death rates from cirrhosis from 1910 through 1914 were higher than at any time since then. After 1914 rates steadily decreased to reach a historical low of 8.0 per 100,000 population in 1932, partially a result of the National Prohibition Act of 1920. Cirrhosis mortality generally increased from the end of Prohibition in 1933 until 1973, when the age-adjusted death rates peaked at 14.9 per 100,000 population. An almost steady decrease then ensued, and by 1998 the age-adjusted mortality rate had dropped to 7.2 per 100,000 population. From 1910 through 1998 age-adjusted cirrhosis death rates were consistently about 2 times as high for males as for females.

In 1998 liver cirrhosis ranked as the tenth leading cause of death for all age groups and the seventh leading cause of death among those ages 25 to 44 and 45 to 64 (Murphy 2000). Between 1982 and 1989 cirrhosis in the United States was the ninth leading cause of death, dropping from seventh place during most of the 1970s and from eighth place between 1978 and 1981. From 1990 through 1993 liver cirrhosis was the eleventh leading cause of death, and since 1994 it has been the tenth leading cause of death in the United States.

Liver Cirrhosis (ICDA-8: all 571), 1970–98

Following a slight increase from 1970 through 1973, unadjusted death rates from liver cirrhosis steadily decreased. Table 2 shows that unadjusted death rates dropped by 39.0 percent from 15.4 deaths per 100,000 population in 1970 to a low of 9.4 deaths per 100,000 population in 1998. A more pronounced decrease of 50.7 percent, from 14.6 deaths per 100,000 population in 1970 to 7.2 deaths per 100,000 population in 1998, was detected in age-adjusted rates.

Similar decreases in age-adjusted death rates occurred from 1970 to 1998 in different race-sex groups (73.4 percent for black females, 62.3 percent for black males, 49.4 percent for white females, and 45.7 percent for white males). Figure 2 shows trends for all liver cirrhosis mortality for black and white males and females. Liver cirrhosis mortality rates for

¹Standard 1940 population distribution:

Age group	Number
0 to 4 years	80,061
5 to 14 years	170,355
15 to 24 years	181,677
25 to 34 years	162,066
35 to 44 years	139,237
45 to 54 years	117,811
55 to 64 years	80,294
65 to 74 years	48,426
75 to 84 years	17,303
85+ years	2,770
All ages	1,000,000

Figure 1. Age-adjusted death rates of liver cirrhosis by sex (death registration States, 1910–32, and United States, 1933–98).

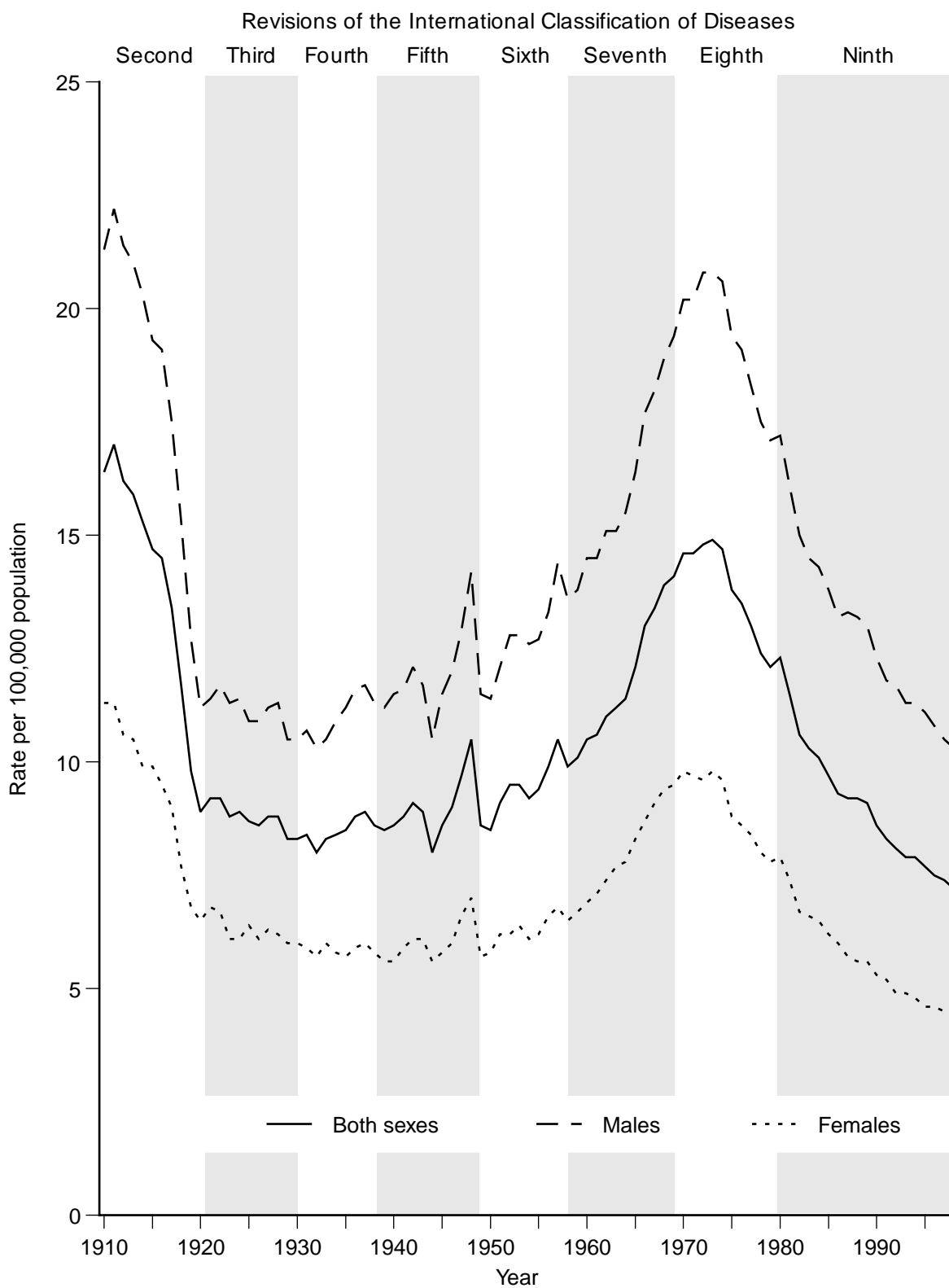
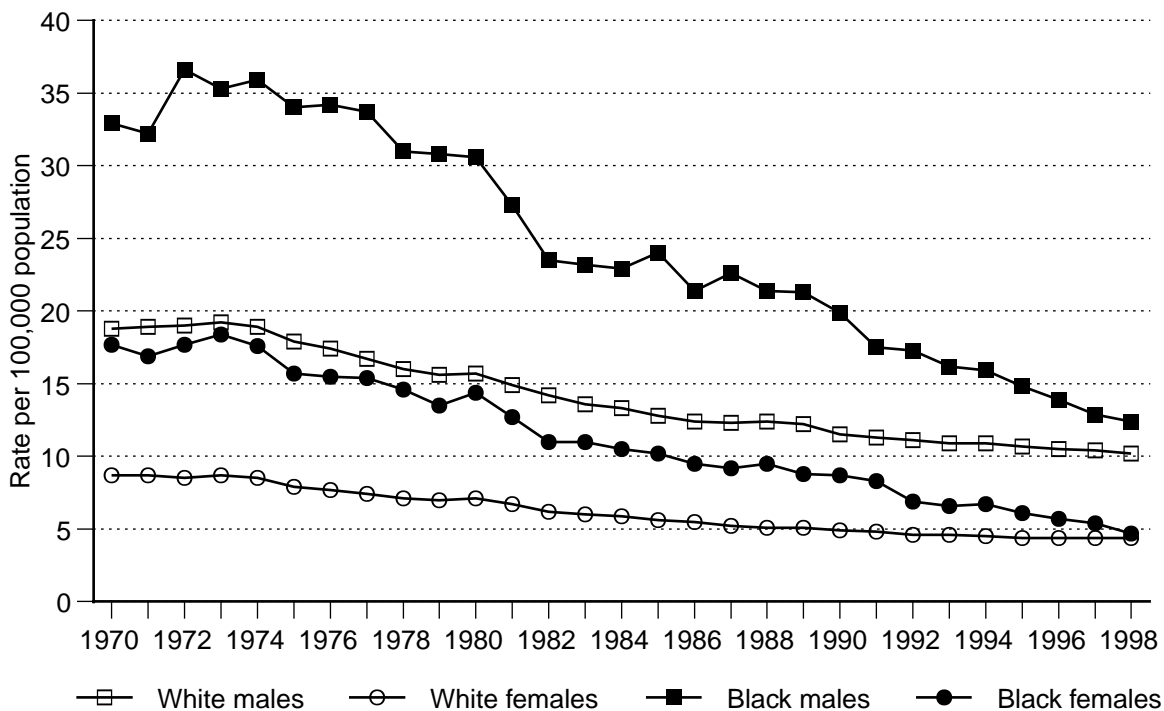


Figure 2. Age-adjusted death rates of liver cirrhosis (ICDA-8: all 571) by sex and race, United States, 1970–98.



whites and blacks reflect a greater risk for men of both races. Rates for blacks are higher than those for whites of the same sex for every year from 1970 through 1998. Nonetheless, with a more rapid decline among blacks than among whites, the significant racial gaps within age-adjusted cirrhosis mortality rates have dramatically narrowed for both males and females.

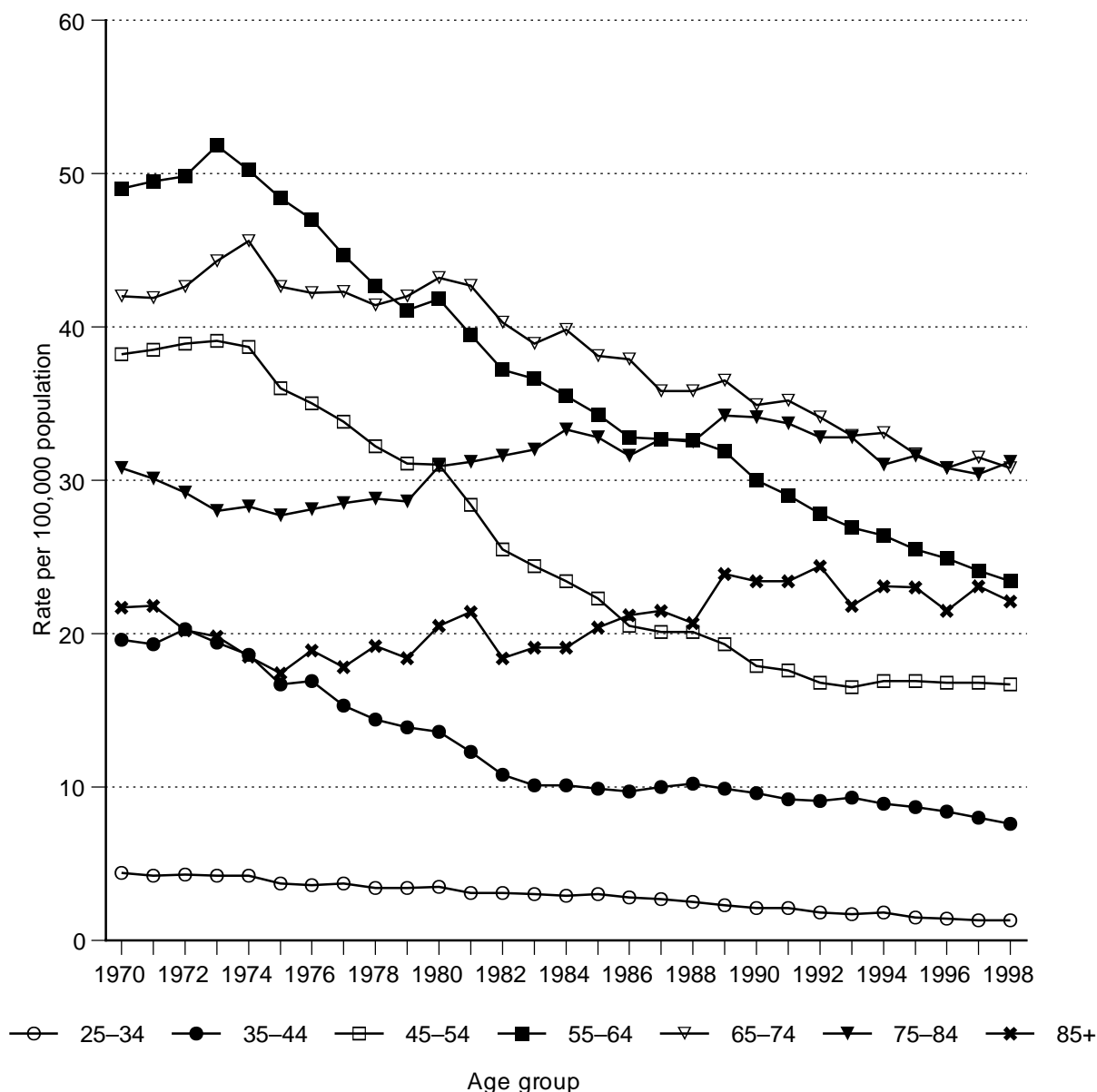
Figure 3 shows age-specific rates for liver cirrhosis mortality. Although the order of risk for cirrhosis mortality by age group changed from 1970 through 1998, risks among those younger than age 45 and those age 85 or older tended to be lower than for other age groups except after 1985, when the mortality rate for the age group 45 to 54 was lower than it was for the age group 85 or older. For the most part, age-specific rates decreased steadily over the past 28 years for age groups below 75. For ages 75 and older, rates slightly increased with minor fluctuations. Changes since 1970 for each age group were as follows: ages 25 to 34

(–70.5 percent); ages 35 to 44 (–61.2 percent); ages 45 to 54 (–56.3 percent); ages 55 to 64 (–52.2 percent); ages 65 to 74 (–26.7 percent); ages 75 to 84 (1.3 percent); and ages 85 and older (1.8 percent).

Figure 4 shows age-specific cirrhosis mortality rates by race and sex. For all age groups among whites and blacks, the rate for males is greater than the rate for females. In age groups below age 65, rates for blacks are higher than rates for whites in both sex groups. The relative decline in liver cirrhosis mortality was greatest among black males and females younger than age 45 and among white and black females ages 45 to 54.

As shown in figure 5, rankings of risk for death from liver cirrhosis change substantially when Hispanic origin is considered in addition to race and sex. In 1998 (see figure 2 and table 2) the age-adjusted cirrhosis death rate for all black males (12.4 deaths per 100,000 population) was 1.2 times as high as that for all white males (10.2 deaths per

Figure 3. Age-specific death rates of liver cirrhosis (ICDA-8: all 571), United States, 1970–98.



100,000 population), making black males the group with the highest risk for death from cirrhosis. However, the 1998 age-adjusted cirrhosis death rate for white Hispanic males (20.1 deaths per 100,000 population) was 2.2 times as high as that for white non-Hispanic males (9.3 deaths per 100,000 population) and 1.6 times as high as that for black non-Hispanic males (12.8 deaths per 100,000 population).

Also striking is the fact that from 1991 to 1998, the age-adjusted rate for cirrhosis

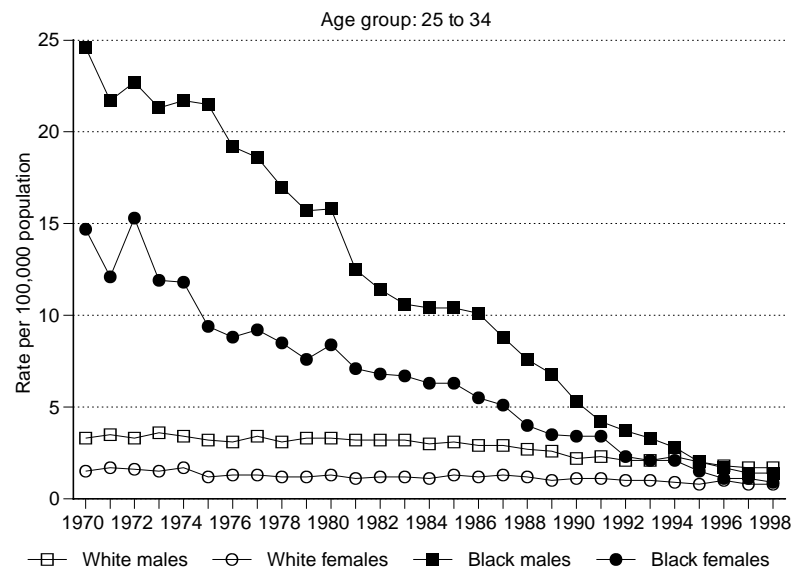
mortality decreased less for the group with the highest risk than it did for the group with the second highest risk. The white Hispanic male mortality rate decreased by only 12.2 percent (from 22.9 to 20.1 deaths per 100,000 population). Over the same period, the black non-Hispanic male mortality rate decreased by 27.3 percent (from 17.6 to 12.8 deaths per 100,000 population).

As discussed earlier, the ICD allows for coding the alcohol involvement in cirrhosis

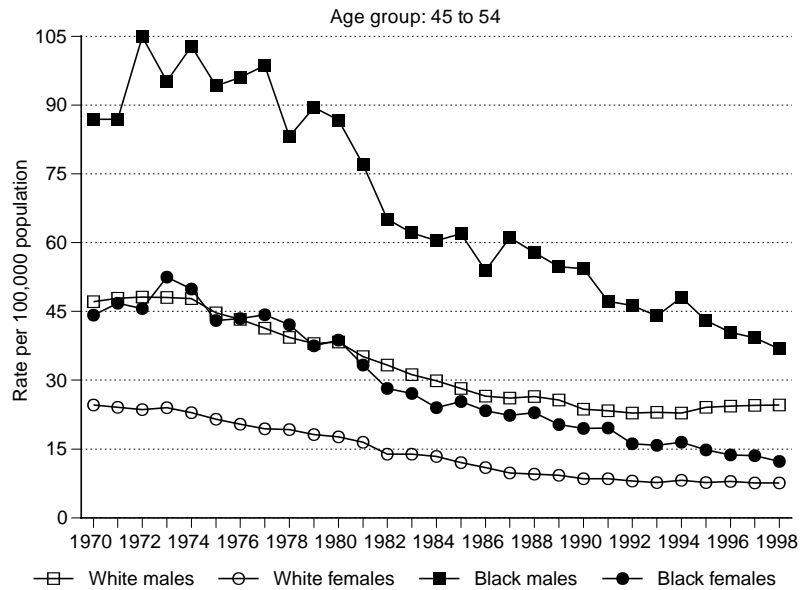
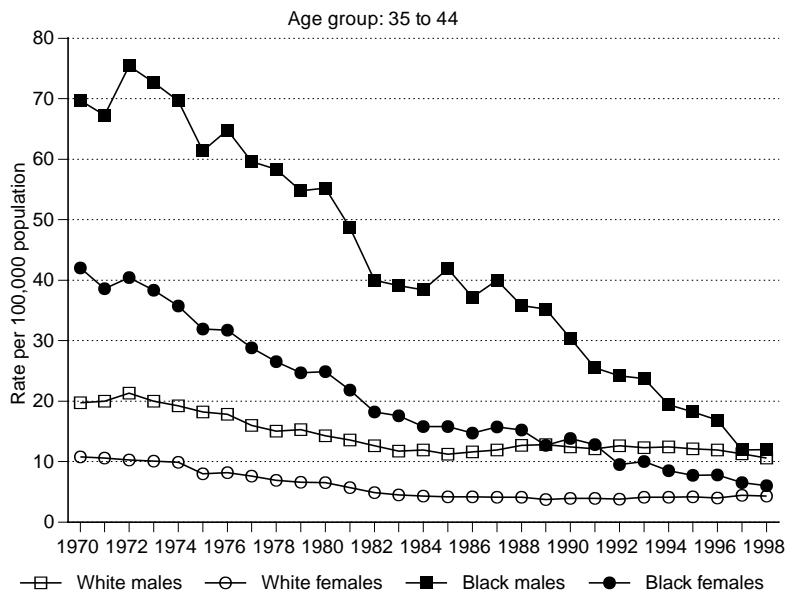
Figure 4. Age-specific death rates of liver cirrhosis by race and sex, United States, 1970–98.

Note: Different age groups have different vertical scales (i.e., rates vary substantially by age).

(Continued on page 10)



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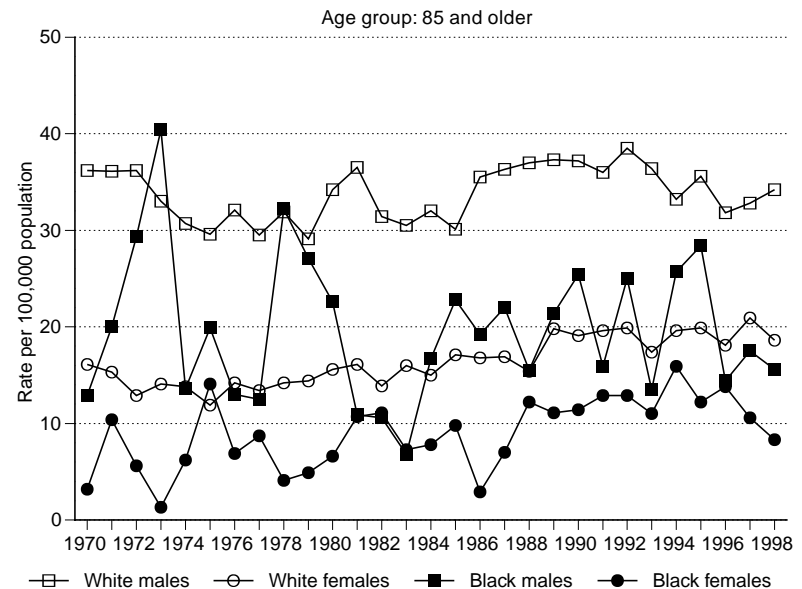
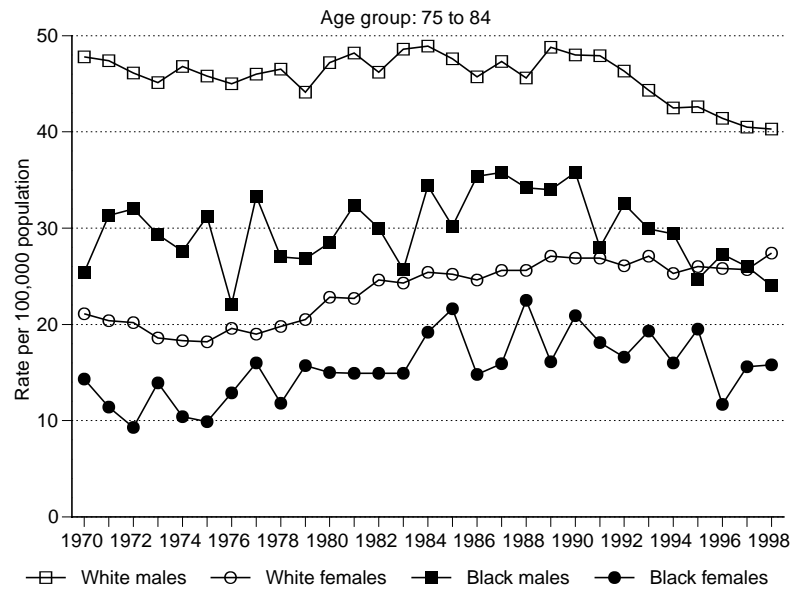
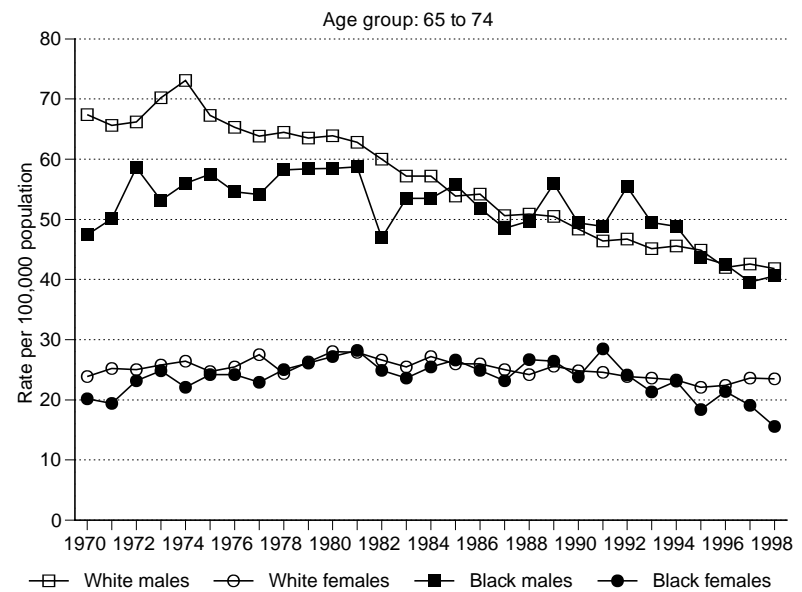
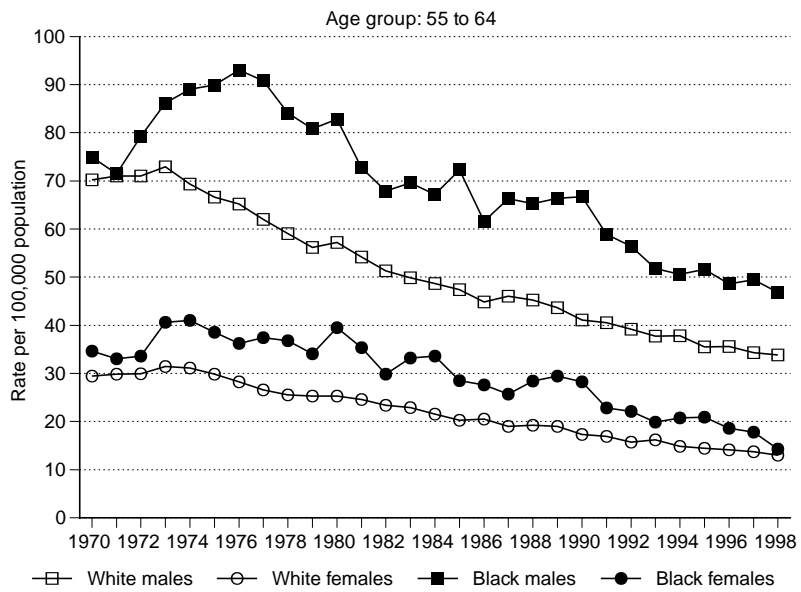


Figure 5. Age-adjusted death rates of liver cirrhosis (ICDA-8: all 571) by sex, race, and Hispanic origin, United States, 1970–98.

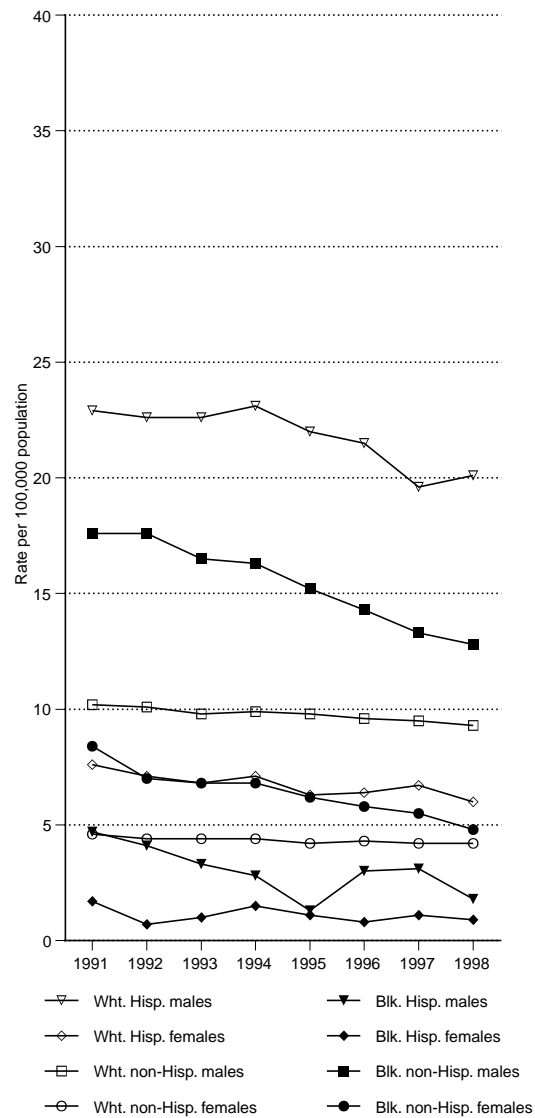
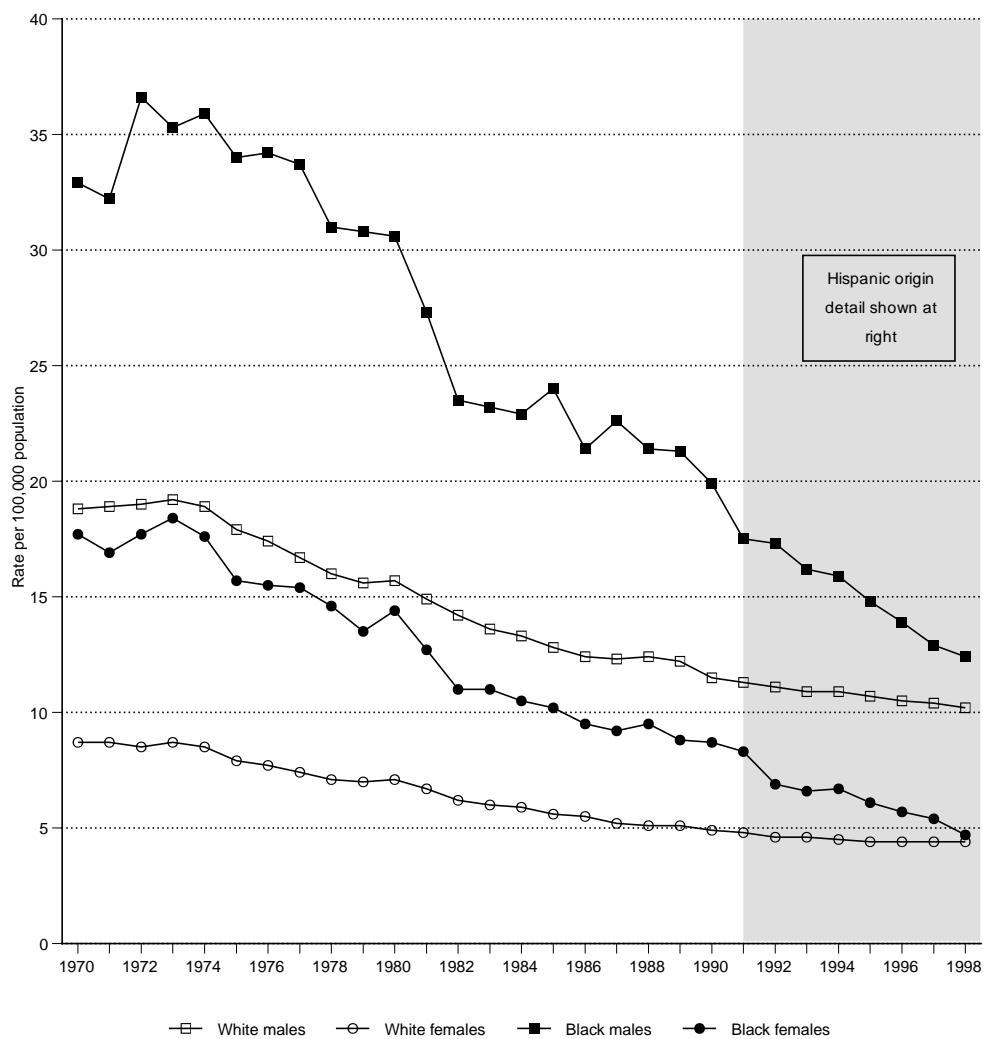
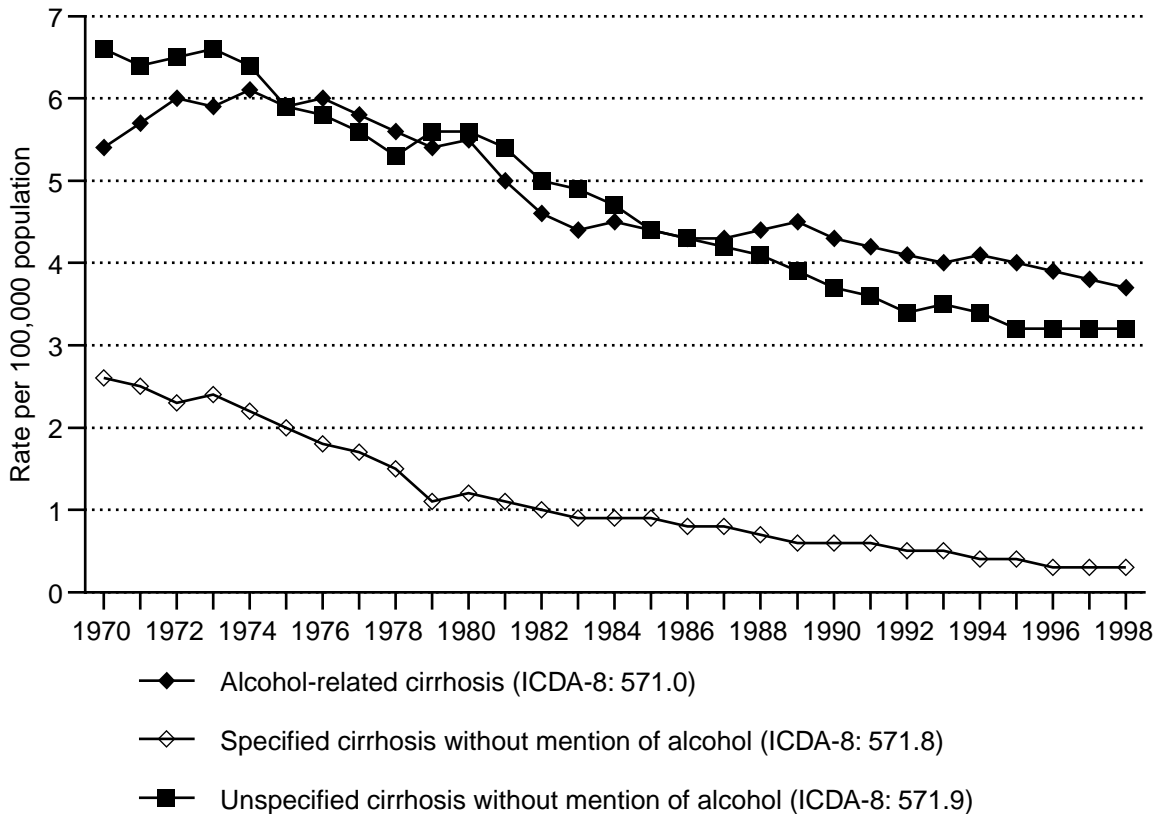


Figure 6. Age-adjusted death rates of liver cirrhosis reported with and without mention of alcohol, United States, 1970–98.



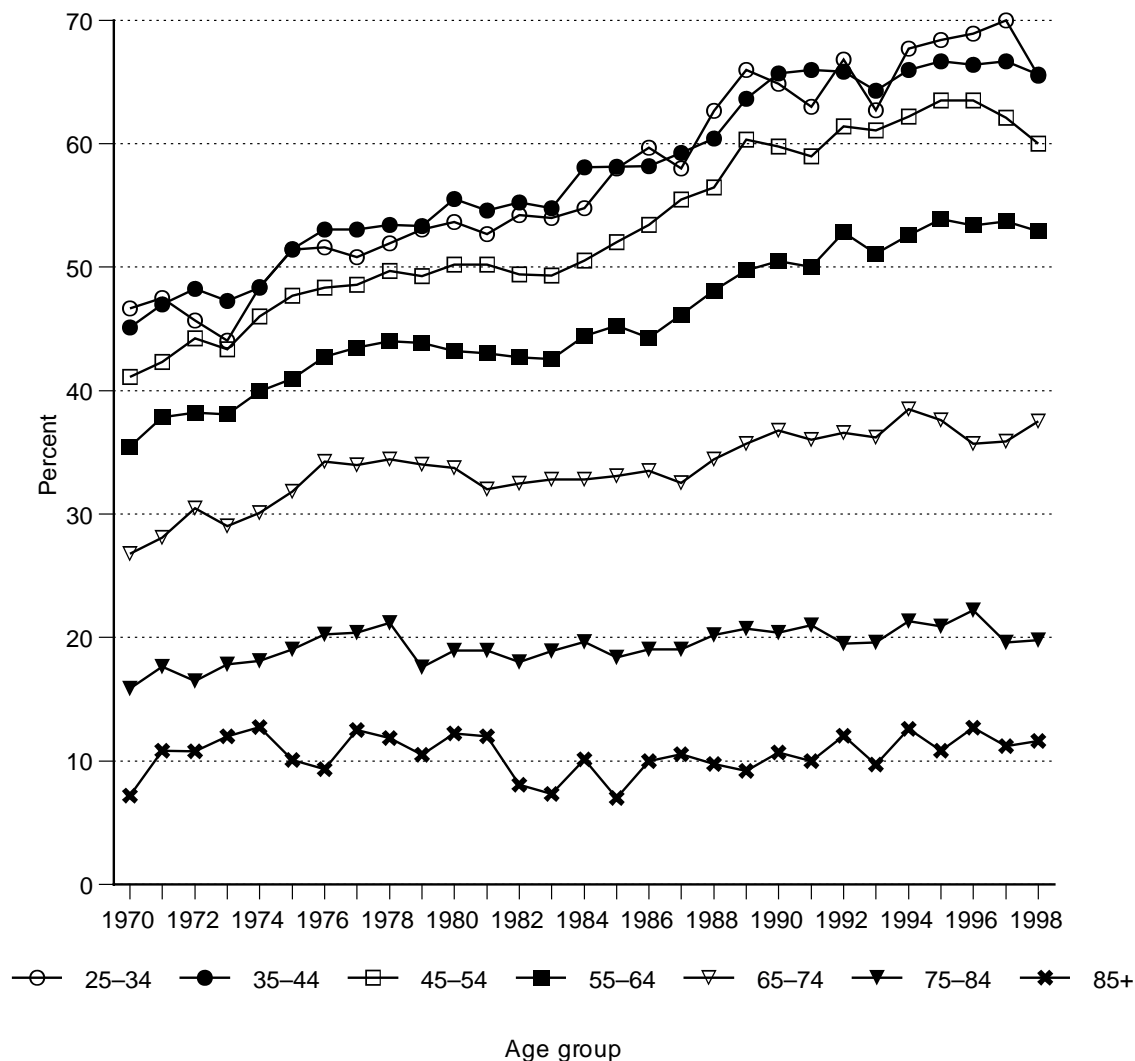
deaths. Figure 6 shows age-adjusted mortality rates for three subcategories of liver cirrhosis. This figure shows little apparent change in ranks of the different types of cirrhosis during the period 1970 through 1998, except that the ranks of unspecified cirrhosis and alcohol-related cirrhosis shifted after 1987, when alcohol-related cirrhosis became the highest among the three causes considered. However, figure 7 shows that the percentage of all cirrhosis deaths coded as alcohol-related for different age groups increased over time in all age groups but less so in the two oldest age groups. In addition the increases tend to be greater in the younger age groups. In 1998 the percentage of alcohol-related cirrhosis among all cirrhosis deaths was highest among people ages 25 to 44.

Alcohol-Related Liver Cirrhosis (ICDA-8: 571.0), 1970–98

The alcohol-related liver cirrhosis death rate decreased by 20.0 percent, from 5.5 deaths per 100,000 population in 1970 to 4.4 deaths per 100,000 population in 1998. The age-adjusted death rate decreased 31.5 percent, from 5.4 deaths per 100,000 population in 1970 to 3.7 deaths per 100,000 population in 1998.

As shown in figure 8 and table 4, age-adjusted death rates among different race-sex groups show a decline over the past 28 years that amounts to 69.0 percent for black females, 54.3 percent for black males, 33.3 percent for white females, and 22.2 percent for white males. During the study period, age-adjusted rates for the different race-sex groups in descending order were as follows: black males, white males, black females, and white females.

Figure 7. Percent of all cirrhosis (ICDA-8: all 571) deaths coded as alcohol-related (ICDA-8: 571.0) by age, United States, 1970–98.



In 1998 the rate for black males exceeded the rate for white males by 23.2 percent. In addition, racial gaps in the rates for both males and females narrowed during the study, with rates for both black males and females showing a prominent decline (reduced by 8.2 and 4.9 deaths per 100,000 population, respectively).

In 1998 the four groups at greatest risk for death from alcohol-related liver cirrhosis were white Hispanic males (12.4 deaths per 100,000 population), black non-Hispanic males (7.1), white non-Hispanic males (5.0), and black non-Hispanic females (2.2). Among

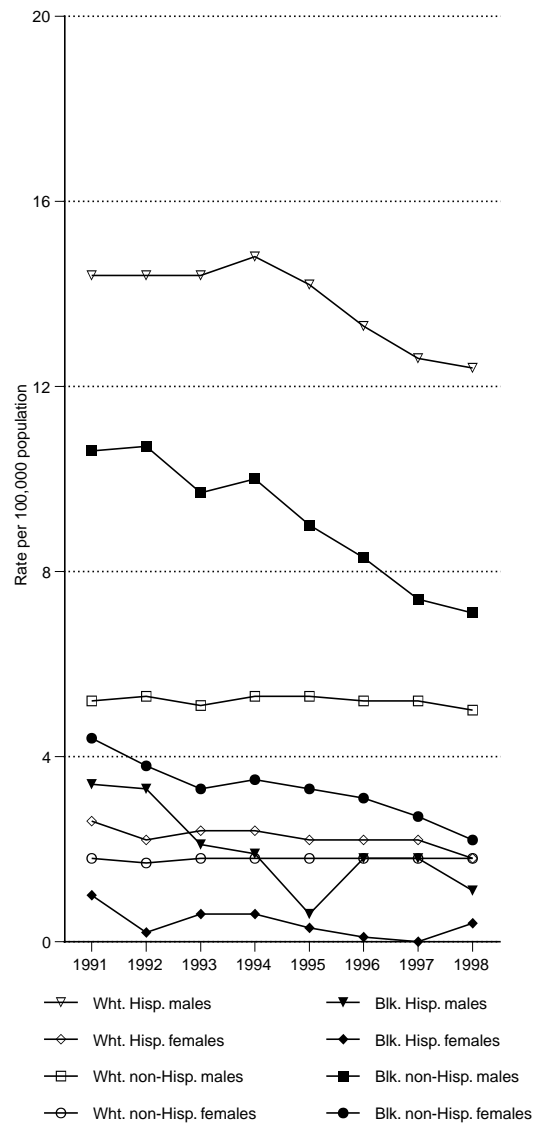
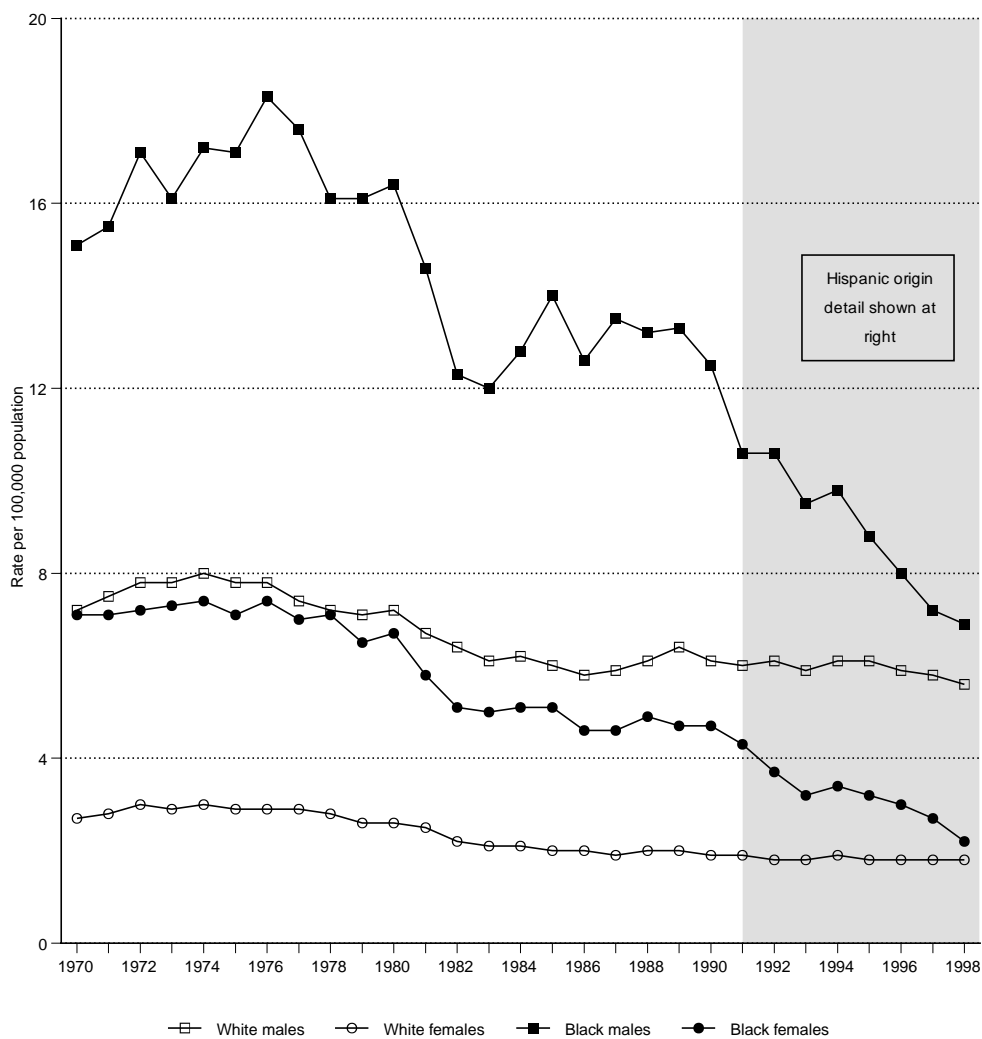
these four groups, the greatest decrease in rates from 1991 to 1998 was seen for black non-Hispanic females (50.0 percent) followed in order of decreasing change by black non-Hispanic males (33.0 percent), white Hispanic males (13.9 percent), and white non-Hispanic males (3.8 percent).

Specified Liver Cirrhosis Without Mention of Alcohol (ICDA-8: 571.8), 1970–98

The unadjusted death rate from specified liver cirrhosis without mention of alcohol declined by 85.2 percent, from a high of 2.7 deaths per 100,000 population in 1970 to 0.4 deaths per 100,000 population in 1998. The

Figure 8. Age-adjusted rates of alcohol-related liver cirrhosis (ICDA-8: 571.0) by sex, race, and Hispanic origin, United States, 1970–98.

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age-adjusted rate showed a similar declining trend, dropping 88.5 percent from 2.6 deaths per 100,000 population in 1970 to 0.3 deaths per 100,000 population in 1998.

Figure 9 and table 4 show that age-adjusted rates among race-sex groups declined from 1970 through 1998 by 92.1 percent for black males, 92.3 percent for black females and 89.7 percent for white males, and 83.3 percent for white females. During the study period, the age-adjusted rates for the different race-sex groups in descending order were as follows: black males, black females, white males, and white females. The gap that existed between rates for the different race-sex groups has virtually disappeared, with black male and female rates both experiencing a prominent decline.

There were no major differences in cirrhosis death rates associated with Hispanic origin during the period from 1991 to 1998.

Unspecified Liver Cirrhosis Without Mention of Alcohol (ICDA-8: 571.9), 1970–98

The unadjusted death rate from unspecified liver cirrhosis without mention of alcohol decreased by 37.5 percent from 7.2 deaths per 100,000 population in 1970 to 4.5 deaths per 100,000 population in 1998. The age-adjusted death rate dropped 51.5 percent from 6.6 deaths per 100,000 population in 1970 to 3.2 deaths per 100,000 population in 1998.

As shown in figure 10 and table 4, age-adjusted death rates among different race-sex groups show a fairly consistent decline over the last 28 years that amounts to 67.6 percent for black females, 55.7 percent for black males, 50.6 percent for white males, and 47.6 percent for white females. The age-adjusted rates during the study period for the different race-sex groups in descending order were as follows: black males, white males, black females, and white females. The gap that existed between the rates for the different race-sex groups has narrowed, with the rate for black males showing a prominent decline (reduced by 6.4 deaths per 100,000 population).

In 1998 the four groups at greatest risk for death from unspecified liver cirrhosis without mention of alcohol were white Hispanic males (7.2 deaths per 100,000 population), black non-Hispanic males (5.2), white non-Hispanic males (4.0), and white Hispanic females (3.6). Among these four groups, the greatest decrease in rates from 1991 to 1998 was seen for white Hispanic females (18.2 percent) followed in order of decreasing change by black non-Hispanic males (11.9 percent), white non-Hispanic males (11.1 percent), and white Hispanic males (8.9 percent).

DISCUSSION

Liver cirrhosis mortality has been declining since 1973, dropping from the seventh leading cause of death for most of the 1970s to the eleventh leading cause of death from 1990 to 1993. In 1994 cirrhosis became the tenth leading cause of death and remained in that position in 1998, ranking above septicemia (eleventh), Alzheimer's disease (twelfth), homicide and legal intervention (thirteenth), and atherosclerosis (fourteenth) as a leading cause of death (Murphy 2000). Age-adjusted, all-cause mortality rates declined 34.0 percent from 1970 to 1998, compared with a 50.7 percent decline for overall liver cirrhosis mortality rates for the same period. This finding suggests that the sizeable reduction in cirrhosis mortality is not just a reflection of the decline in all-cause mortality. Reductions in liver cirrhosis mortality during the study period were seen for each race-sex group when age-adjusted rates were compared. Age-specific death rates of cirrhosis dropped more consistently for the younger age groups. This differential drop in death rates in the younger age groups compared with older age groups is likely due to primary prevention efforts (increased awareness of alcohol as a risk factor for liver cirrhosis) and earlier detection of liver cirrhosis.

In the face of declining trends in liver cirrhosis mortality since the early 1970s, data gathered between 1970 and 1990 with NCHS's ongoing National Hospital Discharge Survey show an increase in hospital discharge episodes with cirrhosis diagnosis until 1981,

Figure 9. Age-adjusted death rates of specified liver cirrhosis without mention of alcohol (ICDA-8: 571.8) by sex, race, and Hispanic origin, United States, 1970–98.

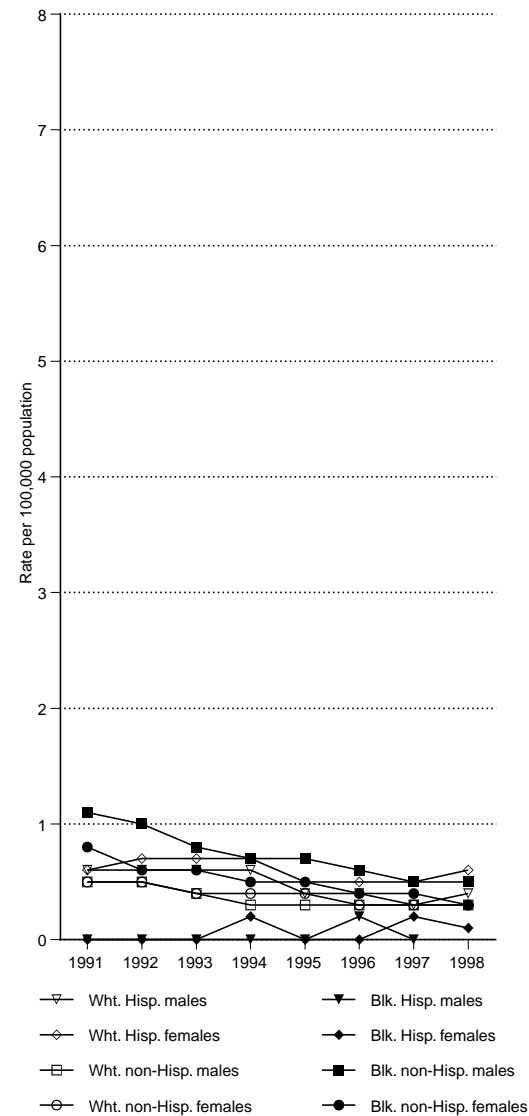
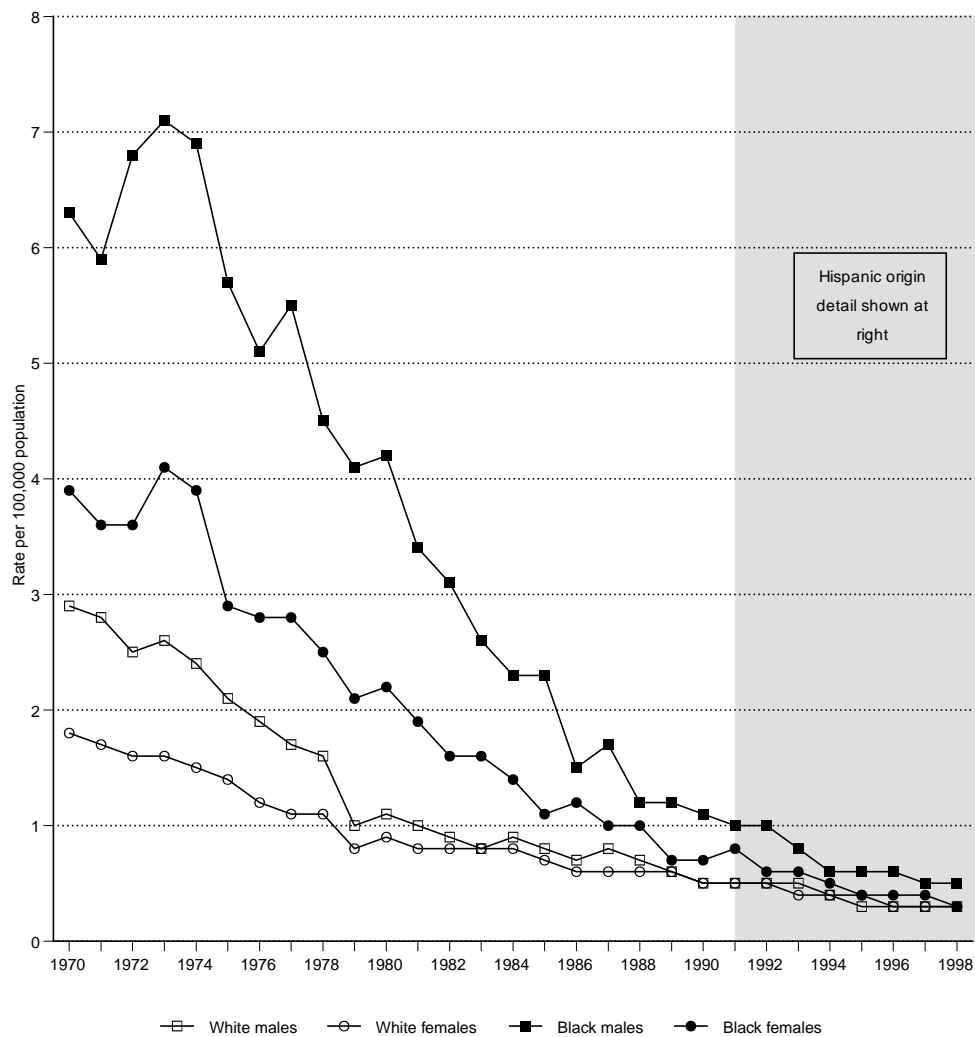
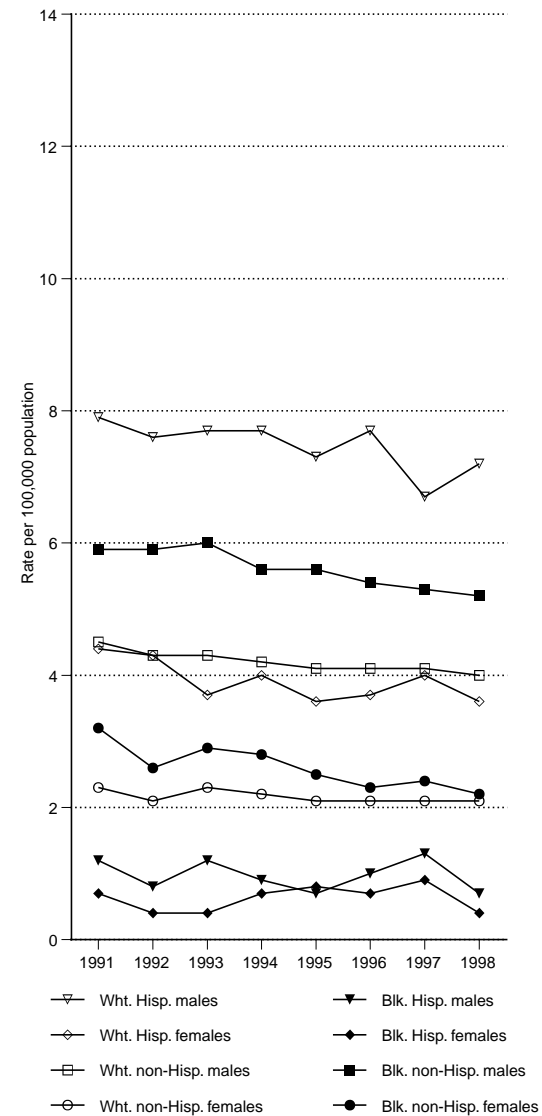
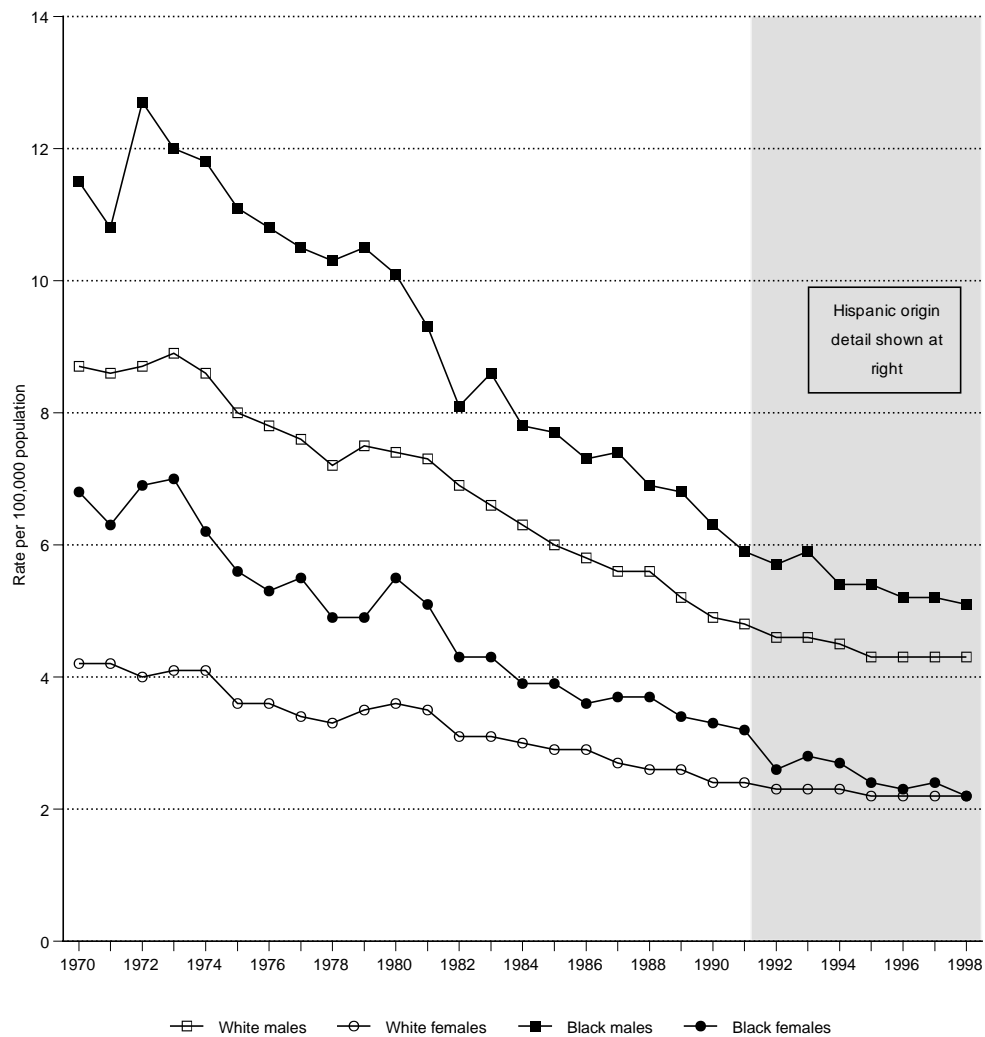


Figure 10. Age-adjusted rates of unspecified liver cirrhosis without mention of alcohol (ICDA-8: 571.9) by sex, race, and Hispanic origin, United States, 1970–98.



when a decline ensued (Noble et al. 1993; Dufour et al. 1993). However, more recent data show that during the 1990s the number of hospital discharges diagnosed as cirrhosis has slightly increased again (Whitmore et al. 2001). The data also show that the percentage of cirrhosis patients who died during hospitalization decreased between 1970 and 1990 (Noble et al. 1993; Dufour et al. 1993). Because it has been estimated that (1) 14 to 50 percent of alcoholics develop cirrhosis or severe liver damage during an 8-year period (Leibach 1974), (2) approximately 50 percent of treated alcoholics could delay the onset of the disease process or delay mortality, and (3) 50 percent of alcoholics attending Alcoholics Anonymous (AA) programs sufficiently reduce their drinking to avoid getting cirrhosis or dying from it (Smart and Mann, 1993), more recognition and treatment of alcoholism could be contributing to the declining trends in mortality from liver cirrhosis. According to data from the National Drug and Alcohol Treatment Utilization Survey, the number of alcoholics in treatment on a given day more than doubled between 1979 and 1991. AA membership increased in an equally dramatic fashion between 1979 and 1989 (Dufour et al. 1993) and continued to increase to over 1.1 million active members by 2001 (Alcoholics Anonymous 2001).

Although mortality from cirrhosis is highly associated with alcohol consumption in the medical literature, the current declining trend in liver cirrhosis mortality has not been preceded by a decline in apparent per capita alcohol consumption. Annual per capita alcohol consumption increased steadily after Prohibition until 1981, after which a long decline ensued (Nephew et al. 2000). The decline in per capita alcohol consumption is attributed to decreased drinking by many types of drinkers. However, the literature suggests that only reductions in drinking by heavy drinkers translate into decline in death rates from liver cirrhosis (Smart and Mann 1992). Data from the National Health Interview Survey indicate that the percentage of self-reported heavier drinkers dropped significantly

between 1983 and 1988 (Williams and DeBaKey 1992).

The findings that white Hispanic males and females have higher mortality rates for cirrhosis than do white non-Hispanic males and females confirm reports of greater risk for cirrhosis mortality among all Hispanic males and females compared with risk for all non-Hispanic males and females (Sorlie et al. 1993). Indeed, while cirrhosis is the fifth leading cause of death among white non-Hispanic males ages 45 to 64, it is the third leading cause of death among Hispanic males in this same age group (Murphy 2000).

The research literature shows differences in patterns of drinking between Hispanic and non-Hispanic males. In a recent review of pertinent literature, Randolph et al. (1998) conclude that there is evidence (based on early studies) that young Hispanic, primarily Mexican-American, males consume alcohol less frequently but in higher quantities than non-Hispanic white and black males. The following highlights from the 1992 National Longitudinal Alcohol Epidemiologic Survey (NLAES) (Stinson et al. 1998) support this conclusion:

- There was a significantly smaller percentage of Hispanic females than non-Hispanic females who were current drinkers (i.e., 12 or more drinks in the year prior to the interview), but there were no differences between Hispanic and non-Hispanic males.
- The same pattern was seen for average daily ethanol consumption, with a significantly smaller percentage of Hispanic females than non-Hispanic females consuming an average of 2 or more drinks per day; there were no differences between Hispanic and non-Hispanic males.
- Significantly greater percentages of Hispanic males than non-Hispanic males had consumed 5 or more drinks in a single day both for 1 to 11 days and for 12 or more days in the year prior to being interviewed, met DSM-IV criteria for any alcohol use disorder and for alcohol dependence in the 12 months prior to the interview, and reported typically drinking

only on weekends. There were no such differences in comparisons of Hispanic and non-Hispanic females.

Further research is needed to determine whether these differences in patterns of drinking between Hispanics and non-Hispanics can be found in other survey data and whether they can account for the observed differences in cirrhosis mortality.

Healthy People 2000 sets the goal for liver cirrhosis mortality reduction at no more than 6.0 cirrhosis deaths per 100,000 population by the Year 2000. Between 1973 and 1998, the decline in liver cirrhosis death rate amounted to 51.7 percent (from 14.9 deaths per 100,000 population in 1973 to 7.2 deaths per 100,000 population in 1998). However, to achieve the Year 2000 goal, the death rate for liver cirrhosis must decline by 59.7 percent from the 1973 high value—an additional 8.0 percentage points. To achieve a decrease from 7.2 to 6.0 deaths per 100,000 population, the rate must drop by an average of 0.60 in each of the years from 1999 to 2000. Decreases this large have occurred in only 4 of the years from 1973 to 1998. As hepatitis B and C are part of the contributing factors to cirrhosis morbidity and mortality, the impact of prevention measures directed at hepatitis in the early 1990s may not be fully appreciated until well into the 21st century (Dufour et al. 1993). Even with enhanced national efforts concentrating on prevention, reductions in heavy and chronic alcohol use, and early detection and treatment of liver cirrhosis, it seems that reaching the Healthy People 2000 goal will be very difficult.

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Table 1. Age-adjusted death rates¹ from liver cirrhosis by sex (death registration States, 1910–32, and United States, 1933–98).

Year	Both sexes	Males	Females	Year	Both sexes	Males	Females
1998	7.2	10.3	4.4	1954	9.2	12.6	6.1
1997	7.4	10.5	4.5	1953	9.5	12.8	6.4
1996	7.5	10.8	4.6	1952	9.5	12.8	6.2
1995	7.7	11.1	4.6	1951	9.1	12.1	6.2
1994	7.9	11.3	4.8	1950	8.5	11.4	5.8
1993	7.9	11.3	4.9	1949	8.6	11.5	5.7
1992	8.1	11.7	4.9	1948	10.5	14.2	7.0
1991	8.3	11.8	5.2	1947	9.7	12.9	6.6
1990	8.6	12.3	5.3	1946	9.0	12.0	6.0
1989	9.1	13.0	5.6	1945	8.6	11.5	5.8
1988	9.2	13.2	5.6	1944	8.0	10.5	5.6
1987	9.2	13.3	5.7	1943	8.9	11.7	6.1
1986	9.3	13.2	6.0	1942	9.1	12.1	6.1
1985	9.7	13.8	6.2	1941	8.8	11.6	5.9
1984	10.1	14.3	6.5	1940	8.6	11.5	5.6
1983	10.3	14.5	6.6	1939	8.5	11.2	5.6
1982	10.6	15.0	6.7	1938	8.6	11.3	5.8
1981	11.5	16.1	7.4	1937	8.9	11.7	6.0
1980	12.3	17.2	7.9	1936	8.8	11.6	5.9
1979	12.1	17.1	7.8	1935	8.5	11.2	5.7
1978	12.4	17.5	8.0	1934	8.4	10.9	5.8
1977	13.0	18.3	8.4	1933 ³	8.3	10.5	6.0
1976	13.5	19.1	8.6	1932	8.0	10.3	5.7
1975	13.8	19.4	8.8	1931	8.4	10.7	5.9
1974	14.7	20.6	9.6	1930	8.3	10.5	6.0
1973	14.9	20.8	9.8	1929	8.3	10.5	6.0
1972 ²	14.8	20.8	9.6	1928	8.8	11.3	6.2
1971	14.6	20.2	9.7	1927	8.8	11.2	6.3
1970	14.6	20.2	9.8	1926	8.6	10.9	6.1
1969	14.1	19.4	9.5	1925	8.7	10.9	6.4
1968	13.9	18.9	9.4	1924	8.9	11.4	6.1
1967	13.4	18.2	9.1	1923	8.8	11.3	6.1
1966	13.0	17.7	8.7	1922	9.2	11.7	6.7
1965	12.1	16.4	8.3	1921	9.2	11.4	6.8
1964	11.4	15.5	7.8	1920	8.9	11.2	6.5
1963	11.2	15.1	7.7	1919	9.8	12.7	6.8
1962	11.0	15.1	7.4	1918	11.7	15.3	7.7
1961	10.6	14.5	7.1	1917	13.4	17.5	9.0
1960	10.5	14.5	6.9	1916	14.5	19.1	9.5
1959	10.1	13.8	6.7	1915	14.7	19.3	9.9
1958	9.9	13.6	6.5	1914	15.3	20.3	9.9
1957	10.5	14.4	6.8	1913	15.9	21.0	10.5
1956	9.9	13.3	6.6	1912	16.2	21.4	10.6
1955	9.4	12.7	6.2	1911	17.0	22.2	11.3

¹ Rates per 100,000 population computed by the direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940.

² Deaths based on a 50-percent sample.

³ Reporting States increased from 10 States and the District of Columbia in 1900 to the entire contiguous United States in 1933.

Table 2. Age-specific number of deaths, age-specific death rates, and age-adjusted death rates¹ from all liver cirrhosis (ICD-9: 571 and 572.3) by race, Hispanic origin, and sex, United States, 1970–98. (Continued)

Race, Hispanic origin ² , sex, and year	Number of deaths, by age group									Deaths per 100,000 population, by age group								Age-adjusted deaths per 100,000 population
	All ³	0–24	25–34	35–44	45–54	55–64	65–74	75–84	85+	All	25–34	35–44	45–54	55–64	65–74	75–84	85+	
1980	19,866	101	868	2,339	4,725	6,012	4,276	1,307	225	18.1	4.7	18.6	42.9	59.2	63.3	45.6	33.0	17.2
1979	19,455	90	851	2,371	4,740	5,832	4,164	1,205	193	17.8	4.8	19.2	42.8	58.2	62.7	42.7	28.9	17.1
1978	19,693	100	795	2,340	4,851	6,018	4,134	1,240	204	18.2	4.6	19.6	43.4	61.0	63.7	45.0	31.7	17.5
1977	20,167	108	853	2,367	5,240	6,236	3,969	1,212	175	18.9	5.1	20.6	46.5	64.3	62.5	44.9	28.2	18.3
1976	20,668	106	790	2,566	5,474	6,426	3,976	1,141	180	19.5	4.9	22.8	48.1	67.3	64.2	43.0	30.2	19.1
1975	20,830	109	793	2,527	5,630	6,436	4,000	1,164	168	19.9	5.1	22.7	49.2	68.5	66.1	44.6	28.8	19.4
1974	21,806	128	804	2,711	6,027	6,581	4,214	1,170	164	21.0	5.4	24.4	52.6	70.8	71.1	45.4	29.1	20.6
1973	21,782	118	785	2,827	5,986	6,791	3,973	1,115	181	21.2	5.5	25.5	52.3	73.8	68.5	43.9	33.5	20.8
1972 ⁴	21,422	94	716	2,980	6,050	6,532	3,736	1,126	186	21.0	5.3	26.8	53.1	71.8	65.7	44.9	35.5	20.8
1971	20,680	124	685	2,763	5,823	6,380	3,578	1,140	176	20.5	5.4	24.8	51.4	71.1	64.2	46.0	34.7	20.2
1970	20,382	116	688	2,790	5,691	6,217	3,583	1,126	166	20.5	5.6	24.9	50.6	70.3	65.6	46.0	33.9	20.2
All races, female																		
1998	8,891	16	175	1,033	1,452	1,550	2,265	1,894	506	6.4	0.9	4.6	8.2	13.1	22.3	26.3	17.7	4.4
1997	8,953	24	179	1,045	1,433	1,601	2,368	1,756	547	6.6	0.9	4.7	8.3	14.0	23.1	24.8	19.8	4.5
1996	8,782	21	211	1,008	1,415	1,628	2,292	1,722	482	6.5	0.5	4.6	8.6	14.5	22.1	24.7	17.8	4.6
1995	8,747	24	190	1,003	1,365	1,692	2,248	1,740	485	6.5	0.9	4.7	8.6	15.3	21.6	25.5	18.5	4.6
1994	8,939	29	247	1,016	1,390	1,699	2,424	1,643	491	6.7	1.2	4.8	9.1	15.4	23.3	24.5	19.3	4.8
1993	8,982	34	246	1,025	1,257	1,824	2,414	1,759	420	6.8	1.2	5.0	8.6	16.6	23.2	26.6	17.0	4.9
1992	8,835	31	265	908	1,254	1,807	2,468	1,641	461	6.8	1.2	4.5	8.9	16.4	23.9	25.1	19.5	4.9
1991	9,220	28	318	998	1,284	1,929	2,543	1,682	434	7.1	1.5	5.0	9.7	17.4	24.8	26.2	19.0	5.2
1990	9,225	41	334	971	1,252	2,051	2,498	1,668	407	7.2	1.5	5.1	9.7	18.4	24.6	26.5	18.5	5.3
1989	9,426	41	310	892	1,346	2,248	2,566	1,617	405	7.5	1.4	4.8	10.7	20.0	25.6	26.2	19.0	5.6
1988	9,275	38	348	971	1,370	2,295	2,409	1,529	314	7.4	1.6	5.5	11.2	20.1	24.3	25.4	15.2	5.6
1987	9,204	43	382	956	1,336	2,276	2,423	1,460	327	7.4	1.8	5.5	11.3	19.7	24.7	24.8	16.2	5.7
1986	9,424	48	389	911	1,433	2,458	2,500	1,368	316	7.6	1.8	5.4	12.3	21.1	25.9	23.8	16.1	6.0
1985	9,582	38	418	909	1,564	2,473	2,467	1,394	317	7.8	2.0	5.6	13.6	21.0	25.9	24.9	16.7	6.2
1984	9,806	50	371	900	1,673	2,662	2,525	1,357	267	8.1	1.8	5.8	14.5	22.6	26.9	24.9	14.5	6.5
1983	9,786	66	390	898	1,775	2,788	2,349	1,245	273	8.1	1.9	6.0	15.4	23.7	25.3	23.5	15.3	6.6
1982	9,834	67	383	919	1,790	2,801	2,406	1,231	236	8.3	1.9	6.4	15.5	23.9	26.3	23.8	13.8	6.7
1981	10,473	76	376	1,025	2,149	2,967	2,507	1,112	257	8.9	1.9	7.6	18.4	25.4	27.9	22.1	15.6	7.4
1980	10,864	79	425	1,159	2,352	3,069	2,462	1,082	234	9.3	2.3	8.9	19.9	26.6	27.9	22.3	15.0	7.9
1979	10,396	65	378	1,131	2,402	2,978	2,273	961	207	9.0	2.1	8.8	20.2	26.1	26.2	20.2	13.8	7.8
1978	10,373	78	385	1,166	2,602	2,978	2,075	892	193	9.1	2.2	9.4	21.7	26.6	24.4	19.2	13.5	8.0
1977	10,681	87	406	1,227	2,665	3,025	2,239	850	177	9.5	2.4	10.2	22.0	27.5	26.9	18.8	13.1	8.4
1976	10,785	77	382	1,320	2,789	3,132	2,064	844	173	9.7	2.3	11.2	22.8	29.0	25.4	19.2	13.6	8.6
1975	10,793	106	376	1,281	2,917	3,252	1,942	766	150	9.8	2.4	11.0	23.7	30.6	24.6	17.6	12.0	8.8
1974	11,513	99	453	1,526	3,178	3,345	1,994	759	158	10.5	3.0	13.1	25.8	32.0	25.9	17.9	13.5	9.6
1973	11,568	104	416	1,585	3,319	3,323	1,925	750	144	10.7	2.9	13.6	26.9	32.2	25.7	18.2	13.1	9.8
1972 ⁴	11,154	108	458	1,634	3,156	3,074	1,820	770	130	10.4	3.3	14.0	25.7	30.1	24.8	19.4	12.5	9.6
1971	11,128	142	403	1,649	3,217	3,034	1,774	761	148	10.5	3.1	14.1	26.4	30.2	24.7	19.8	15.1	9.7
1970	11,017	143	412	1,732	3,207	2,951	1,663	767	140	10.5	3.2	14.6	26.6	29.9	23.7	20.7	15.2	9.8
White, male																		
1998	14,151	23	269	1,952	3,568	3,177	3,056	1,739	364	12.9	1.7	10.6	24.6	33.8	41.8	40.3	34.2	10.2
1997	14,109	23	276	2,077	3,464	3,105	3,131	1,702	327	13.0	1.7	11.3	24.5	34.3	42.6	40.5	32.8	10.4
1996	14,051	28	289	2,145	3,310	3,151	3,120	1,693	310	13.0	1.8	11.9	24.3	35.6	42.0	41.4	31.8	10.5
1995	14,163	30	333	2,159	3,163	3,119	3,346	1,677	329	13.2	2.0	12.1	24.1	35.5	44.9	42.6	35.6	10.7
1994	14,076	20	392	2,160	2,886	3,305	3,382	1,628	296	13.2	2.3	12.4	22.8	37.8	45.6	42.5	33.2	10.9
1993	13,888	33	373	2,107	2,791	3,283	3,332	1,652	311	13.2	2.1	12.3	23.0	37.7	45.1	44.3	36.4	10.9

Table 2. Age-specific number of deaths, age-specific death rates, and age-adjusted death rates¹ from all liver cirrhosis (ICD-9: 571 and 572.3) by race, Hispanic origin, and sex, United States, 1970–98. (Continued)

Race, Hispanic origin ² , sex, and year	Number of deaths, by age group									Deaths per 100,000 population, by age group							Age-adjusted deaths per 100,000 population	
	All ³	0–24	25–34	35–44	45–54	55–64	65–74	75–84	85+	All	25–34	35–44	45–54	55–64	65–74	75–84		85+
1992	13,978	27	377	2,107	2,654	3,418	3,399	1,675	316	13.4	2.1	12.6	22.8	39.2	46.7	46.3	38.5	11.1
1991	13,850	24	413	1,997	2,536	3,546	3,347	1,692	286	13.4	2.3	12.1	23.3	40.5	46.4	47.9	36.0	11.3
1990	13,950	29	402	1,972	2,528	3,620	3,462	1,644	285	13.6	2.2	12.4	23.7	41.1	48.4	48.0	37.2	11.5
1989	14,492	33	467	1,978	2,680	3,871	3,558	1,623	278	14.3	2.6	12.8	25.7	43.6	50.5	48.8	37.3	12.2
1988	14,471	33	497	1,901	2,682	4,067	3,543	1,473	269	14.4	2.7	12.7	26.4	45.2	50.9	45.6	37.0	12.4
1987	14,259	47	520	1,736	2,546	4,181	3,479	1,487	260	14.2	2.9	11.9	26.1	46.0	50.6	47.3	36.3	12.3
1986	14,174	43	521	1,633	2,543	4,130	3,656	1,396	249	14.3	2.9	11.6	26.5	44.8	54.2	45.7	35.5	12.4
1985	14,402	44	554	1,513	2,688	4,403	3,571	1,416	207	14.6	3.1	11.2	28.2	47.4	53.9	47.6	30.1	12.8
1984	14,874	54	522	1,556	2,846	4,535	3,726	1,416	216	15.2	3.0	11.9	29.9	48.7	57.2	48.9	32.0	13.3
1983	14,910	39	548	1,466	2,970	4,632	3,677	1,370	202	15.3	3.2	11.7	31.2	49.9	57.2	48.6	30.5	13.6
1982	15,323	55	539	1,518	3,187	4,754	3,790	1,271	204	15.9	3.2	12.6	33.3	51.3	60.0	46.2	31.4	14.2
1981	15,946	62	527	1,534	3,394	5,002	3,900	1,292	232	16.6	3.2	13.6	35.1	54.2	62.8	48.2	36.5	14.9
1980	16,492	75	520	1,574	3,745	5,236	3,897	1,226	212	17.4	3.3	14.3	38.3	57.2	63.9	47.2	34.2	15.7
1979	16,178	60	518	1,660	3,744	5,082	3,803	1,127	177	17.1	3.3	15.3	38.0	56.2	63.5	44.1	29.1	15.6
1978	16,413	67	461	1,579	3,923	5,249	3,775	1,163	187	17.5	3.1	15.0	39.3	59.0	64.5	46.5	31.9	16.0
1977	16,727	69	495	1,623	4,160	5,426	3,653	1,130	167	18.0	3.4	16.0	41.3	62.0	63.8	46.0	29.5	16.7
1976	17,221	65	441	1,762	4,418	5,618	3,650	1,086	174	18.7	3.1	17.8	43.3	65.2	65.3	45.0	32.1	17.4
1975	17,458	72	435	1,789	4,591	5,650	3,672	1,090	157	19.1	3.2	18.2	44.7	66.6	67.3	45.8	29.6	17.9
1974	18,322	92	449	1,880	4,913	5,820	3,905	1,102	157	20.2	3.4	19.2	47.8	69.3	73.1	46.8	30.7	18.9
1973	18,372	67	449	1,963	4,943	6,061	3,676	1,049	162	20.4	3.6	20.0	48.0	72.9	70.2	45.1	33.0	19.2
1972 ⁴	17,964	56	392	2,102	4,932	5,846	3,400	1,062	172	20.1	3.3	21.3	48.1	71.0	66.2	46.1	36.2	19.0
1971	17,672	78	389	1,982	4,887	5,773	3,306	1,081	166	20.0	3.5	20.0	47.9	71.0	65.6	47.4	36.1	18.9
1970	17,389	84	361	1,969	4,775	5,622	3,335	1,078	161	19.9	3.3	19.7	47.1	70.2	67.4	47.8	36.2	18.8
White, Hispanic, male																		
1998	2,085	3	83	391	594	506	347	131	30	15.0	3.4	18.6	48.8	74.5	80.0	66.4	53.9	20.1
1997	1,983	9	71	393	583	460	298	140	28	14.4	2.8	18.9	49.5	70.4	71.0	78.3	55.2	19.6
1996	2,068	11	70	427	572	456	361	144	25	15.7	2.8	21.8	51.9	73.0	89.0	86.6	52.6	21.5
1995	1,997	10	78	392	539	486	344	122	24	15.7	3.1	21.2	52.3	80.7	88.7	78.6	54.0	22.0
1994	2,017	4	104	444	514	455	361	114	21	16.5	4.3	25.5	53.3	78.1	97.9	78.1	50.7	23.1
1993	1,876	9	91	402	505	442	305	101	21	15.9	3.9	24.5	55.7	78.3	87.4	72.6	54.1	22.6
1992	1,791	6	83	400	470	420	289	104	18	15.8	3.6	25.9	55.2	76.7	87.9	77.9	50.0	22.6
1991	1,739	5	106	409	430	446	249	82	11	16.0	4.8	28.1	54.0	84.0	80.0	63.8	33.0	22.9
White, non-Hispanic, male																		
1998	11,986	20	183	1,547	2,946	2,653	2,698	1,603	334	12.5	1.4	9.5	22.2	30.4	39.2	38.9	33.1	9.3
1997	12,052	13	202	1,669	2,863	2,627	2,818	1,559	299	12.7	1.5	10.3	22.1	31.3	40.7	38.7	31.6	9.5
1996	11,675	16	216	1,667	2,669	2,619	2,694	1,512	282	12.6	1.6	10.5	21.7	32.4	39.2	39.4	31.6	9.6
1995	11,848	20	250	1,714	2,566	2,554	2,928	1,517	296	12.8	1.8	11.0	21.6	31.9	42.3	40.8	34.2	9.8
1994	11,780	16	280	1,671	2,312	2,791	2,958	1,482	266	12.8	1.9	10.8	20.2	34.9	42.8	41.0	31.9	9.9
1993	11,610	23	277	1,649	2,196	2,735	2,932	1,510	283	12.7	1.9	10.9	19.9	34.2	42.5	42.8	35.1	9.8
1992	11,793	18	278	1,645	2,102	2,903	3,027	1,530	289	12.9	1.8	11.0	19.9	36.2	44.3	44.5	37.2	10.1
1991	11,716	17	297	1,535	2,030	3,000	3,004	1,563	265	12.9	1.9	10.4	20.5	37.2	44.3	46.8	35.3	10.2
Black, male																		
1998	1,817	4	35	313	624	462	284	79	14	11.1	1.4	12.0	36.8	46.8	40.6	24.0	15.6	12.4
1997	1,827	5	36	304	636	475	273	83	15	11.3	1.4	11.9	39.2	49.5	39.6	26.0	17.5	12.9
1996	1,931	1	43	418	624	455	291	85	12	12.1	1.7	16.9	40.4	48.6	42.5	27.3	14.4	13.9

Table 2. Age-specific number of deaths, age-specific death rates, and age-adjusted death rates¹ from all liver cirrhosis (ICD-9: 571 and 572.3) by race, Hispanic origin, and sex, United States, 1970–98. (Continued)

Race, Hispanic origin ² , sex, and year	Number of deaths, by age group									Deaths per 100,000 population, by age group								Age-adjusted deaths per 100,000 population
	All ³	0–24	25–34	35–44	45–54	55–64	65–74	75–84	85+	All	25–34	35–44	45–54	55–64	65–74	75–84	85+	
1995	2,008	13	52	440	631	477	295	75	23	12.8	2.0	18.2	43.0	51.6	43.7	24.7	28.4	14.8
1994	2,102	10	73	456	670	461	325	87	20	13.6	2.8	19.4	48.0	50.6	48.8	29.4	25.7	15.9
1993	2,113	12	87	539	583	467	325	86	10	13.9	3.3	23.7	44.0	51.8	49.5	29.9	13.5	16.2
1992	2,197	10	97	529	587	504	358	93	18	14.6	3.7	24.2	46.3	56.4	55.4	32.5	25.0	17.3
1991	2,148	13	108	533	569	522	308	79	11	14.6	4.2	25.5	47.2	58.9	48.8	28.0	15.9	17.5
1990	2,400	5	138	603	641	587	305	100	17	16.5	5.3	30.4	54.3	66.7	49.4	35.8	25.4	19.9
1989	2,524	15	176	664	634	585	340	93	14	17.7	6.8	35.2	54.7	66.4	55.9	34.0	21.4	21.3
1988	2,485	15	194	642	654	578	299	92	10	17.7	7.6	35.8	57.8	65.3	49.7	34.2	15.5	21.4
1987	2,584	11	222	684	676	589	289	95	14	18.6	8.8	40.0	61.1	66.3	48.5	35.8	22.0	22.6
1986	2,416	14	249	608	584	548	305	92	12	17.6	10.1	37.2	53.9	61.6	51.8	35.4	19.2	21.4
1985	2,636	15	249	648	662	642	326	77	14	19.5	10.4	41.9	61.9	72.3	55.8	30.2	22.8	24.0
1984	2,468	19	242	565	638	595	310	86	10	18.5	10.4	38.4	60.4	67.2	53.5	34.4	16.7	22.9
1983	2,440	15	240	547	649	612	309	63	4	18.5	10.6	39.1	62.1	69.6	53.5	25.7	6.8	23.2
1982	2,420	23	249	535	674	592	269	72	6	18.6	11.4	40.0	65.1	67.9	46.9	30.0	10.6	23.5
1981	2,746	20	264	621	794	628	335	76	6	21.4	12.5	48.7	77.0	72.7	58.7	32.4	10.9	27.3
1980	3,031	25	311	683	889	708	332	65	12	24.0	15.8	55.2	86.7	82.8	58.5	28.5	22.6	30.6
1979	2,964	25	292	648	909	685	329	60	14	24.1	15.7	54.8	89.5	80.8	58.4	26.8	27.1	30.8
1978	2,944	26	301	674	843	702	321	59	16	24.3	17.0	58.3	83.1	84.1	58.2	27.0	32.2	31.0
1977	3,140	30	315	675	1,000	747	293	71	6	26.2	18.6	59.6	98.6	90.8	54.1	33.3	12.5	33.7
1976	3,142	36	310	720	977	755	290	46	6	26.6	19.2	64.8	96.0	93.0	54.6	22.1	13.0	34.2
1975	3,084	34	331	673	957	718	299	63	9	26.5	21.5	61.4	94.2	89.9	57.5	31.2	19.9	34.0
1974	3,205	30	318	762	1,044	702	286	54	6	27.9	21.7	69.6	102.8	89.0	56.0	27.6	13.6	35.9
1973	3,120	51	297	794	965	671	266	55	17	27.5	21.3	72.7	95.2	86.2	53.2	29.3	40.4	35.3
1972 ⁴	3,180	36	302	820	1,056	610	286	58	12	28.4	22.7	75.4	104.9	79.2	58.6	32.0	29.3	36.6
1971	2,757	43	275	729	866	542	238	55	8	25.1	21.7	67.3	86.9	71.5	50.1	31.3	20.0	32.2
1970	2,771	31	304	756	855	557	219	43	5	25.7	24.6	69.7	86.9	74.9	47.4	25.4	12.9	32.9
Black, Hispanic, male																		
1998	12	—	—	4	4	4	—	—	—	1.4	—	2.9	5.1	9.7	—	—	—	1.8
1997	17	—	—	2	4	4	5	2	—	2.0	—	1.5	5.5	10.3	21.6	23.8	—	3.1
1996	16	—	—	3	5	4	1	3	—	2.0	—	2.4	7.4	10.9	4.6	38.4	—	3.0
1995	7	—	—	2	2	2	—	1	—	0.9	—	1.7	3.2	5.8	—	13.9	—	1.3
1994	15	—	—	5	7	3	—	—	—	2.0	—	4.4	12.0	9.1	—	—	—	2.8
1993	16	—	—	6	4	3	2	1	—	2.3	—	5.7	7.4	9.6	11.6	16.3	—	3.3
1992	17	—	—	3	6	3	4	—	1	2.5	—	3.0	11.9	10.2	25.1	—	77.1	4.1
1991	18	—	—	4	5	4	5	—	—	2.8	—	4.3	10.7	14.2	34.1	—	—	4.7
Black, non-Hispanic, male																		
1998	1,783	4	35	304	612	452	282	79	14	11.5	1.5	12.3	37.8	47.8	41.8	24.8	16.0	12.8
1997	1,798	5	36	301	628	466	268	79	15	11.8	1.5	12.5	40.5	50.6	40.2	25.4	17.9	13.3
1996	1,899	1	43	415	611	447	287	82	11	12.7	1.8	17.8	41.7	50.1	43.7	27.3	13.6	14.3
1995	1,972	12	51	429	623	468	291	74	23	13.3	2.1	18.8	44.7	53.0	44.8	25.2	29.3	15.2
1994	2,056	10	72	445	655	450	319	86	19	14.1	3.0	20.1	49.3	51.6	49.7	30.0	25.2	16.3
1993	2,055	12	87	524	571	449	317	83	9	14.2	3.6	24.4	45.2	52.0	50.0	29.5	12.3	16.5
1992	2,135	10	96	514	568	491	347	92	16	15.0	3.9	24.8	46.9	57.4	55.7	33.2	22.6	17.6
1991	2,075	13	103	516	550	506	294	78	11	14.9	4.2	25.9	47.7	59.4	48.1	28.5	16.2	17.6

Table 2. Age-specific number of deaths, age-specific death rates, and age-adjusted death rates¹ from all liver cirrhosis (ICD-9: 571 and 572.3) by race, Hispanic origin, and sex, United States, 1970–98. (Continued)

Race, Hispanic origin ² , sex, and year	Number of deaths, by age group									Deaths per 100,000 population, by age group								Age-adjusted deaths per 100,000 population
	All ³	0–24	25–34	35–44	45–54	55–64	65–74	75–84	85+	All	25–34	35–44	45–54	55–64	65–74	75–84	85+	
White, female																		
1998	7,710	9	132	792	1,124	1,317	2,078	1,775	483	6.8	0.8	4.3	7.6	13.0	23.5	27.4	18.6	4.4
1997	7,668	13	125	803	1,103	1,337	2,119	1,644	524	6.8	0.8	4.4	7.6	13.7	23.6	25.7	20.9	4.4
1996	7,469	16	165	726	1,102	1,347	2,040	1,622	448	6.7	1.0	4.0	7.9	14.1	22.4	25.8	18.1	4.4
1995	7,377	11	136	742	1,040	1,368	2,024	1,602	454	6.6	0.8	4.2	7.7	14.4	22.1	26.0	19.9	4.4
1994	7,498	21	158	719	1,057	1,402	2,147	1,538	456	6.8	0.9	4.1	8.2	14.8	23.3	25.3	19.6	4.5
1993	7,571	21	168	698	957	1,532	2,172	1,628	393	6.9	1.0	4.1	7.7	16.2	23.6	27.1	17.4	4.6
1992	7,428	23	174	628	958	1,486	2,187	1,542	429	6.8	1.0	3.8	8.0	15.7	23.9	26.1	19.9	4.6
1991	7,646	18	198	646	949	1,616	2,241	1,567	409	7.1	1.1	3.9	8.5	16.9	24.6	26.9	19.6	4.8
1990	7,621	26	203	619	930	1,670	2,245	1,538	387	7.1	1.1	3.9	8.5	17.3	24.8	26.9	19.1	4.9
1989	7,835	23	185	566	1,006	1,857	2,291	1,520	387	7.4	1.0	3.7	9.3	19.0	25.6	27.1	19.8	5.1
1988	7,600	27	207	616	998	1,915	2,142	1,401	294	7.2	1.2	4.1	9.5	19.2	24.2	25.6	15.4	5.1
1987	7,642	24	223	606	988	1,918	2,195	1,374	314	7.3	1.3	4.1	9.8	19.0	25.0	25.6	16.9	5.2
1986	7,869	33	213	593	1,081	2,108	2,253	1,284	303	7.6	1.2	4.2	10.9	20.5	26.0	24.6	16.8	5.5
1985	7,922	30	225	574	1,188	2,103	2,217	1,286	299	7.7	1.3	4.2	12.0	20.3	26.0	25.2	17.1	5.6
1984	8,169	32	185	574	1,322	2,245	2,290	1,266	255	8.0	1.1	4.3	13.4	21.5	27.2	25.4	15.0	5.9
1983	8,146	36	204	572	1,378	2,386	2,126	1,179	263	8.0	1.2	4.5	13.9	22.9	25.5	24.3	16.0	6.0
1982	8,210	38	192	593	1,389	2,435	2,183	1,160	220	8.1	1.2	4.9	13.9	23.4	26.6	24.6	13.9	6.2
1981	8,648	50	178	652	1,668	2,554	2,254	1,044	244	8.6	1.1	5.7	16.5	24.6	27.9	22.7	16.1	6.7
1980	8,876	41	204	734	1,812	2,615	2,227	1,017	224	8.9	1.3	6.5	17.6	25.3	28.0	22.8	15.6	7.1
1979	8,574	49	181	727	1,882	2,581	2,058	895	200	8.6	1.2	6.6	18.1	25.3	26.3	20.5	14.4	7.0
1978	8,464	48	188	743	2,022	2,558	1,871	844	188	8.6	1.2	6.9	19.2	25.5	24.4	19.8	14.2	7.1
1977	8,721	46	185	782	2,065	2,616	2,063	791	168	9.0	1.3	7.6	19.4	26.6	27.5	19.0	13.4	7.4
1976	8,833	40	186	829	2,202	2,736	1,876	797	167	9.1	1.3	8.2	20.4	28.2	25.5	19.6	14.2	7.7
1975	8,871	72	170	801	2,350	2,844	1,765	730	137	9.3	1.2	8.0	21.5	29.8	24.7	18.2	11.9	7.9
1974	9,421	62	223	996	2,511	2,923	1,839	717	150	9.9	1.7	9.9	22.9	31.1	26.4	18.3	13.8	8.5
1973	9,444	69	195	1,023	2,632	2,919	1,755	708	143	10.0	1.5	10.1	24.0	31.4	25.8	18.6	14.1	8.7
1972 ⁴	9,174	68	194	1,044	2,578	2,750	1,670	744	124	9.8	1.6	10.3	23.6	29.9	25.0	20.2	12.9	8.5
1971	9,218	101	192	1,089	2,619	2,704	1,646	728	139	10.0	1.7	10.6	24.1	29.8	25.2	20.4	15.3	8.7
1970	9,075	102	172	1,121	2,658	2,624	1,532	728	137	9.9	1.5	10.8	24.6	29.4	23.9	21.1	16.1	8.7
White, Hispanic, female																		
1998	743	3	24	72	118	155	197	138	36	5.4	1.1	3.6	9.2	19.8	36.1	48.0	32.5	6.0
1997	780	5	15	93	128	158	218	124	39	6.0	0.7	4.9	10.7	21.6	41.8	46.1	39.0	6.7
1996	716	7	22	82	127	137	193	106	42	5.7	1.0	4.5	11.3	19.5	38.2	41.5	45.0	6.4
1995	669	3	12	82	103	153	169	109	38	5.6	0.6	4.7	9.7	22.6	34.9	45.0	44.1	6.3
1994	693	1	15	74	120	163	201	95	24	6.0	0.7	4.5	12.0	24.8	43.4	41.1	30.1	7.1
1993	652	8	16	72	101	158	163	108	26	5.8	0.8	4.6	10.7	24.8	36.9	48.6	35.1	6.8
1992	643	2	18	49	121	147	182	100	24	6.0	0.9	3.3	13.6	23.7	43.5	46.8	35.3	7.1
1991	650	4	17	76	95	179	174	85	19	6.2	0.9	5.4	11.4	29.7	43.7	41.3	30.5	7.6
White, non-Hispanic, female																		
1998	6,950	6	108	718	1,004	1,160	1,875	1,634	445	7.0	0.8	4.4	7.4	12.4	22.6	26.4	17.9	4.2
1997	6,855	8	110	703	968	1,175	1,891	1,517	483	6.9	0.8	4.3	7.3	13.0	22.4	24.8	20.1	4.2
1996	6,613	9	143	633	952	1,188	1,808	1,483	396	6.8	1.0	4.0	7.6	13.7	21.4	25.1	17.1	4.3
1995	6,556	8	120	646	914	1,185	1,815	1,461	407	6.8	0.9	4.1	7.5	13.7	21.3	25.1	18.0	4.2
1994	6,649	20	138	633	917	1,211	1,903	1,408	419	6.9	1.0	4.1	7.8	14.0	22.2	24.5	19.0	4.4
1993	6,728	12	150	613	833	1,322	1,950	1,489	358	7.0	1.0	4.0	7.4	15.3	22.7	26.3	16.7	4.4

Table 2. Age-specific number of deaths, age-specific death rates, and age-adjusted death rates¹ from all liver cirrhosis (ICD-9: 571 and 572.3) by race, Hispanic origin, and sex, United States, 1970–98. (Continued)

Race, Hispanic origin ² , sex, and year	Number of deaths, by age group									Deaths per 100,000 population, by age group								Age-adjusted deaths per 100,000 population
	All ³	0–24	25–34	35–44	45–54	55–64	65–74	75–84	85+	All	25–34	35–44	45–54	55–64	65–74	75–84	85+	
1992	6,552	20	150	557	804	1,290	1,947	1,394	390	6.8	1.0	3.7	7.4	14.8	22.7	24.9	18.8	4.4
1991	6,803	11	176	551	831	1,405	2,007	1,441	381	7.1	1.1	3.7	8.2	15.9	23.5	26.1	19.0	4.6
Black, female																		
1998	900	6	25	177	251	185	151	87	18	5.0	0.9	6.0	12.3	14.3	15.6	15.8	8.3	4.7
1997	1,007	10	31	189	264	223	183	85	22	5.6	1.1	6.5	13.5	17.8	19.1	15.6	10.6	5.4
1996	1,031	3	31	220	255	227	204	63	28	5.9	1.1	7.8	13.7	18.6	21.4	11.7	13.8	5.7
1995	1,079	9	42	214	262	251	174	103	24	6.2	1.5	7.7	14.8	20.9	18.4	19.5	12.2	6.1
1994	1,157	7	60	238	278	245	216	83	30	6.7	2.1	8.5	16.5	20.7	23.1	16.0	15.9	6.7
1993	1,133	11	60	261	253	232	197	99	20	6.7	2.1	10.0	15.8	19.9	21.3	19.3	11.0	6.6
1992	1,140	6	66	239	246	255	221	85	22	6.8	2.3	9.5	16.1	22.1	24.1	16.6	12.9	6.9
1991	1,336	8	100	310	285	261	258	91	21	8.1	3.4	12.8	19.6	22.8	28.5	18.1	12.9	8.3
1990	1,363	13	100	317	277	321	212	104	18	8.4	3.4	13.8	19.5	28.2	23.8	20.9	11.4	8.7
1989	1,337	15	101	279	282	333	231	78	17	8.4	3.5	12.7	20.3	29.4	26.4	16.1	11.1	8.8
1988	1,431	8	114	318	313	322	231	106	18	9.1	4.0	15.2	22.9	28.4	26.7	22.5	12.2	9.5
1987	1,345	14	144	316	298	291	198	73	10	8.7	5.1	15.7	22.3	25.7	23.2	15.9	7.0	9.2
1986	1,347	14	153	283	306	311	210	66	4	8.8	5.5	14.7	23.3	27.6	24.9	14.8	2.9	9.5
1985	1,446	7	172	290	328	320	221	93	13	9.6	6.3	15.8	25.3	28.5	26.6	21.6	9.8	10.2
1984	1,446	18	168	277	308	374	210	80	10	9.7	6.3	15.8	24.0	33.6	25.5	19.2	7.8	10.5
1983	1,460	22	172	294	345	366	192	60	9	9.9	6.7	17.6	27.1	33.2	23.6	14.9	7.3	11.0
1982	1,441	27	169	292	356	325	200	58	13	9.9	6.8	18.2	28.2	29.8	24.9	14.9	11.1	11.0
1981	1,616	21	171	333	420	380	223	56	12	11.3	7.1	21.8	33.3	35.3	28.2	14.9	10.7	12.7
1980	1,776	36	191	371	487	419	211	54	7	12.6	8.4	24.9	38.7	39.5	27.2	15.0	6.6	14.4
1979	1,619	14	164	356	468	357	200	55	5	11.8	7.6	24.7	37.5	34.1	26.1	15.7	4.9	13.5
1978	1,701	24	174	372	522	378	186	40	4	12.6	8.5	26.5	42.1	36.8	25.0	11.8	4.1	14.6
1977	1,762	37	181	396	545	377	166	52	8	13.2	9.2	28.8	44.3	37.4	22.9	16.0	8.7	15.4
1976	1,734	30	167	428	532	358	170	40	6	13.2	8.8	31.7	43.4	36.2	24.2	12.9	6.9	15.5
1975	1,725	30	169	423	524	372	164	30	12	13.4	9.4	31.9	43.0	38.5	24.2	9.9	14.1	15.7
1974	1,885	35	203	472	603	390	146	30	5	14.8	11.8	35.7	49.9	41.0	22.1	10.4	6.2	17.6
1973	1,937	31	195	504	629	379	158	38	1	15.5	11.9	38.3	52.5	40.6	24.8	13.9	1.3	18.4
1972 ⁴	1,830	40	240	530	538	308	144	24	4	14.9	15.3	40.4	45.6	33.6	23.2	9.3	5.6	17.7
1971	1,713	35	181	504	545	296	117	28	7	14.1	12.1	38.6	46.8	33.0	19.4	11.4	10.4	16.9
1970	1,766	39	216	550	504	303	118	33	2	14.9	14.7	42.0	44.2	34.6	20.2	14.3	3.2	17.7
Black, Hispanic, female																		
1998	7	—	1	—	1	1	3	—	1	0.8	0.7	—	1.2	2.0	9.1	—	21.7	0.9
1997	7	—	—	—	—	3	3	—	1	0.9	—	—	—	6.5	9.7	—	24.7	1.1
1996	5	—	—	—	1	2	—	2	—	0.6	—	—	1.4	4.6	—	15.3	—	0.8
1995	7	—	—	1	2	1	1	2	—	0.9	—	0.9	3.0	2.4	3.6	16.2	—	1.1
1994	8	—	—	1	1	2	4	—	—	1.1	—	0.9	1.6	5.0	15.4	—	—	1.5
1993	5	—	—	1	1	2	1	—	—	0.7	—	1.0	1.7	5.3	4.1	—	—	1.0
1992	3	—	—	—	1	2	—	—	—	0.5	—	—	1.8	5.5	—	—	—	0.7
1991	8	—	1	1	3	1	2	—	—	1.3	0.8	1.1	5.9	2.9	9.3	—	—	1.7
Black, non-Hispanic, female																		
1998	890	5	24	177	248	184	148	87	17	5.2	0.9	6.3	12.6	14.8	15.9	16.2	8.0	4.8
1997	991	10	30	187	263	218	177	85	21	5.8	1.1	6.8	14.0	18.1	19.1	16.0	10.4	5.5
1996	1,012	3	31	218	251	221	202	58	28	6.1	1.2	8.1	14.1	18.9	22.1	11.2	14.2	5.8

Table 2. Age-specific number of deaths, age-specific death rates, and age-adjusted death rates¹ from all liver cirrhosis (ICD-9: 571 and 572.3) by race, Hispanic origin, and sex, United States, 1970–98. (Continued)

Race, sex, and year	Number of deaths, by age group									Deaths per 100,000 population, by age group							Age-adjusted deaths per 100,000 population	
	All ²	0–24	25–34	35–44	45–54	55–64	65–74	75–84	85+	All	25–34	35–44	45–54	55–64	65–74	75–84		85+
1995	1,059	9	42	209	258	247	170	100	24	6.4	1.6	7.9	15.2	21.4	18.7	19.6	12.6	6.2
1994	1,137	7	60	237	272	239	211	81	30	7.0	2.2	9.2	16.9	21.1	23.4	16.1	16.3	6.8
1993	1,107	11	58	259	247	224	192	96	20	6.9	2.1	10.4	16.1	20.0	21.5	19.2	11.2	6.8
1992	1,118	6	66	234	242	248	217	84	21	7.0	2.4	9.7	16.5	22.4	24.6	17.0	12.3	7.0
1991	1,303	8	96	303	276	255	253	90	21	8.3	3.5	13.1	19.8	23.1	29.0	18.4	12.9	8.4

— There were no deaths in this table cell.

- ¹ Rates per 100,000 population computed by direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940.
- ² Excludes deaths for which Hispanic origin was unknown and all 1991 through 1996 deaths from Oklahoma and New Hampshire where Hispanic origin was unknown in more than 90 percent of all cirrhosis deaths.
- ³ Includes deaths for which age of decedent was unknown; age-specific numbers of deaths may not sum to total.
- ⁴ Deaths based on a 50-percent sample.

Table 3. Age-specific number of deaths, age-specific death rates, and age-adjusted death rates¹ from liver cirrhosis with and without mention of alcohol, United States, 1970–98.

ICDA-8 code and year	Number of deaths, by age group									Deaths per 100,000 population, by age group								Age-adjusted deaths per 100,000 population	
	All ²	0–24	25–34	35–44	45–54	55–64	65–74	75–84	85+	All	25–34	35–44	45–54	55–64	65–74	75–84	85+		
Alcohol-related cirrhosis (571.0)																			
1998	11,798	11	332	2,217	3,462	2,805	2,127	738	104	4.4	0.9	5.0	10.0	12.4	11.6	6.2	2.6	3.7	
1997	11,945	6	362	2,345	3,509	2,827	2,094	699	100	4.5	0.9	5.3	10.4	13.0	11.3	6.0	2.6	3.8	
1996	12,079	5	394	2,426	3,455	2,849	2,054	784	104	4.6	1.0	5.6	10.7	13.3	11.0	6.8	2.7	3.9	
1995	12,211	13	416	2,476	3,339	2,902	2,231	738	91	4.6	1.0	5.8	10.7	13.7	11.9	6.6	2.5	4.0	
1994	12,241	13	499	2,449	3,146	2,921	2,383	722	103	4.7	1.2	5.9	10.5	13.9	12.7	6.6	2.9	4.1	
1993	11,653	13	455	2,426	2,887	2,882	2,219	688	72	4.5	1.1	6.0	10.1	13.8	11.9	6.4	2.1	4.0	
1992	11,868	12	514	2,383	2,819	3,067	2,303	672	96	4.7	1.2	6.0	10.3	14.7	12.5	6.4	2.9	4.1	
1991	11,688	13	542	2,378	2,654	3,029	2,245	741	77	4.6	1.3	6.1	10.3	14.4	12.3	7.2	2.4	4.2	
1990	11,985	19	580	2,381	2,700	3,198	2,320	701	76	4.8	1.3	6.3	10.7	15.2	12.8	6.9	2.5	4.3	
1989	12,308	23	650	2,302	2,862	3,376	2,328	696	65	5.0	1.5	6.3	11.6	15.9	13.0	7.1	2.2	4.5	
1988	11,792	17	665	2,163	2,710	3,376	2,169	630	58	4.8	1.5	6.2	11.3	15.7	12.3	6.6	2.0	4.4	
1987	11,265	27	665	2,033	2,575	3,282	2,031	582	64	4.6	1.6	5.9	11.2	15.1	11.7	6.2	2.3	4.3	
1986	11,060	30	708	1,866	2,482	3,188	2,174	548	58	4.6	1.7	5.7	11.0	14.5	12.7	6.0	2.1	4.3	
1985	11,288	17	725	1,817	2,598	3,432	2,121	534	38	4.7	1.7	5.7	11.6	15.5	12.6	6.0	1.4	4.4	
1984	11,386	25	640	1,791	2,651	3,490	2,168	566	50	4.8	1.6	5.9	11.9	15.8	13.1	6.5	1.9	4.5	
1983	11,076	22	653	1,625	2,694	3,444	2,091	509	35	4.7	1.6	5.6	12.1	15.6	12.8	6.0	1.4	4.4	
1982	11,293	28	653	1,669	2,830	3,497	2,110	466	36	4.9	1.7	6.0	12.6	15.9	13.1	5.7	1.5	4.6	
1981	12,085	35	630	1,772	3,219	3,726	2,166	472	60	5.3	1.6	6.7	14.3	17.0	13.6	5.9	2.6	5.0	
1980	12,938	36	694	1,942	3,554	3,923	2,274	453	56	5.7	1.9	7.6	15.6	18.1	14.6	5.9	2.5	5.5	
1979	12,547	28	652	1,867	3,520	3,864	2,189	381	42	5.6	1.8	7.4	15.3	18.0	14.3	5.0	1.9	5.4	
1978	12,828	38	613	1,873	3,705	3,957	2,138	452	47	5.8	1.8	7.7	16.0	18.8	14.3	6.1	2.3	5.6	
1977	13,029	40	640	1,906	3,838	4,028	2,109	420	44	5.9	1.9	8.1	16.4	19.5	14.4	5.8	2.2	5.8	
1976	13,289	37	605	2,061	3,995	4,084	2,068	402	33	6.1	1.9	8.9	16.9	20.1	14.4	5.7	1.8	6.0	
1975	12,932	35	601	1,960	4,076	3,968	1,890	367	32	6.0	1.9	8.6	17.2	19.8	13.6	5.3	1.7	5.9	
1974	13,151	36	608	2,049	4,235	3,962	1,867	349	41	6.2	2.0	9.0	17.8	20.1	13.7	5.1	2.4	6.1	
1973	12,624	44	529	2,085	4,032	3,850	1,711	332	39	6.0	1.8	9.2	17.0	19.7	12.9	5.0	2.4	5.9	
1972 ³	12,576	30	536	2,226	4,072	3,672	1,692	312	34	6.0	2.0	9.8	17.2	19.0	13.0	4.8	2.2	6.0	
1971	11,892	37	517	2,072	3,826	3,563	1,504	335	35	5.7	2.0	9.1	16.3	18.7	11.8	5.3	2.4	5.7	
1970	11,207	15	513	2,040	3,658	3,251	1,406	300	22	5.5	2.0	8.9	15.7	17.4	11.3	4.9	1.6	5.4	
Other specified cirrhosis (571.8)																			
1998	1,216	10	50	168	216	189	245	271	67	0.4	0.1	0.4	0.6	0.8	1.3	2.3	1.7	0.3	
1997	1,257	21	43	167	214	158	313	263	78	0.5	0.1	0.4	0.6	0.7	1.7	2.2	2.0	0.3	
1996	1,269	22	59	193	165	185	298	269	78	0.5	0.1	0.4	0.5	0.9	1.6	2.3	2.1	0.3	
1995	1,371	23	59	194	218	207	308	277	82	0.5	0.1	0.5	0.7	1.0	1.6	2.5	2.2	0.4	
1994	1,391	24	78	187	221	220	331	265	65	0.5	0.2	0.5	0.7	1.0	1.8	2.4	1.8	0.4	
1993	1,614	36	74	244	230	251	377	329	73	0.6	0.2	0.6	0.8	1.2	2.0	3.1	2.1	0.5	
1992	1,789	30	79	249	245	282	446	357	100	0.7	0.2	0.6	0.9	1.3	2.4	3.4	3.1	0.5	
1991	1,821	30	110	227	272	330	440	338	70	0.7	0.3	0.6	1.1	1.6	2.4	3.3	2.2	0.6	
1990	1,811	23	119	241	250	327	459	316	73	0.7	0.3	0.6	0.9	1.6	2.5	3.1	2.4	0.6	
1989	1,932	32	102	287	294	387	461	293	75	0.8	0.2	0.8	1.2	1.8	2.6	3.0	2.5	0.6	
1988	2,067	35	161	316	309	410	473	295	67	0.8	0.4	0.9	1.3	1.9	2.7	3.1	2.3	0.7	
1987	2,279	39	186	339	333	470	520	316	76	0.9	0.4	1.0	1.4	2.2	3.0	3.4	2.7	0.8	
1986	2,179	45	193	325	303	469	499	276	68	0.9	0.5	1.0	1.3	2.1	2.9	3.0	2.5	0.8	
1985	2,447	46	221	357	403	543	507	303	64	1.0	0.5	1.1	1.8	2.5	3.0	3.4	2.4	0.9	
1984	2,555	54	227	383	431	574	513	313	60	1.1	0.6	1.3	1.9	2.6	3.1	3.6	2.3	0.9	
1983	2,495	62	215	357	424	607	496	281	50	1.1	0.5	1.2	1.9	2.7	3.0	3.3	2.0	0.9	

Table 3. Age-specific number of deaths, age-specific death rates, and age-adjusted death rates¹ from liver cirrhosis with and without mention of alcohol, United States, 1970–98. (Continued)

ICDA-8 code and year	Number of deaths, by age group									Deaths per 100,000 population, by age group								Age-adjusted deaths per 100,000 population
	All ²	0–24	25–34	35–44	45–54	55–64	65–74	75–84	85+	All	25–34	35–44	45–54	55–64	65–74	75–84	85+	
1982	2,669	63	226	371	507	645	511	292	53	1.2	0.6	1.3	2.3	2.9	3.2	3.6	2.2	1.0
1981	2,654	76	245	391	537	592	516	233	63	1.2	0.6	1.5	2.4	2.7	3.3	2.9	2.7	1.1
1980	3,000	79	285	452	588	714	558	249	72	1.3	0.8	1.8	2.6	3.3	3.6	3.2	3.2	1.2
1979	2,764	65	244	413	613	633	493	234	65	1.2	0.7	1.6	2.7	3.0	3.2	3.1	3.0	1.1
1978	3,641	60	252	516	839	954	676	284	55	1.6	0.7	2.1	3.6	4.5	4.5	3.8	2.7	1.5
1977	3,908	78	262	504	963	1,034	710	289	63	1.8	0.8	2.1	4.1	5.0	4.8	4.0	3.2	1.7
1976	4,092	65	237	560	1,000	1,132	700	336	58	1.9	0.7	2.4	4.2	5.6	4.9	4.8	3.1	1.8
1975	4,549	79	280	575	1,126	1,311	812	315	50	2.1	0.9	2.5	4.7	6.5	5.8	4.5	2.7	2.0
1974	5,025	80	293	735	1,315	1,311	908	333	49	2.4	1.0	3.2	5.5	6.6	6.7	4.9	2.8	2.2
1973	5,341	73	322	742	1,475	1,498	867	303	57	2.5	1.1	3.3	6.2	7.7	6.5	4.6	3.5	2.4
1972 ³	5,140	78	272	780	1,360	1,394	862	322	70	2.5	1.0	3.4	5.7	7.2	6.6	5.0	4.5	2.3
1971	5,361	101	255	845	1,396	1,434	901	354	72	2.6	1.0	3.7	5.9	7.5	7.1	5.6	4.8	2.5
1970	5,520	98	261	864	1,513	1,491	870	362	59	2.7	1.0	3.7	6.5	8.0	7.0	5.9	4.2	2.6
Unspecified cirrhosis (571.9)																		
1998	12,289	23	125	995	2,089	2,307	3,297	2,725	725	4.5	0.3	2.2	6.0	10.2	17.9	22.8	17.9	3.2
1997	12,087	27	112	1,004	1,926	2,279	3,421	2,601	716	4.5	0.3	2.3	5.7	10.4	18.5	22.2	18.5	3.2
1996	11,815	23	119	1,037	1,821	2,298	3,401	2,479	635	4.5	0.3	2.4	5.6	10.8	18.2	21.6	16.7	3.2
1995	11,763	36	133	1,043	1,701	2,276	3,402	2,503	668	4.5	0.3	2.5	5.5	10.8	18.2	22.5	18.3	3.2
1994	11,888	22	160	1,075	1,694	2,416	3,470	2,400	649	4.6	0.4	2.6	5.7	11.5	18.6	22.0	18.3	3.4
1993	12,074	32	197	1,102	1,606	2,504	3,528	2,502	601	4.7	0.5	2.7	5.6	12.0	18.9	23.3	17.6	3.5
1992	11,750	28	176	987	1,528	2,458	3,551	2,416	603	4.6	0.4	2.5	5.6	11.7	19.2	23.0	18.4	3.4
1991	12,053	23	212	991	1,554	2,717	3,573	2,396	592	4.8	0.5	2.5	6.0	12.9	19.5	23.2	18.7	3.6
1990	12,124	34	195	1,001	1,567	2,807	3,532	2,422	564	4.9	0.5	2.7	6.2	13.3	19.5	24.0	18.5	3.7
1989	12,583	36	233	1,029	1,588	3,024	3,731	2,372	568	5.1	0.5	2.8	6.5	14.2	20.9	24.1	19.2	3.9
1988	12,713	35	235	1,102	1,782	3,234	3,661	2,191	470	5.2	0.5	3.1	7.5	15.0	20.8	22.8	16.3	4.1
1987	12,807	39	296	1,059	1,732	3,360	3,693	2,160	466	5.3	0.7	3.1	7.5	15.5	21.2	23.1	16.6	4.2
1986	13,071	34	285	1,016	1,861	3,546	3,821	2,053	454	5.4	0.7	3.1	8.2	16.1	22.3	22.5	16.6	4.3
1985	13,192	37	304	952	1,994	3,611	3,782	2,070	440	5.5	0.7	3.0	8.9	16.3	22.5	23.3	16.5	4.4
1984	13,527	47	301	910	2,162	3,792	3,928	2,001	384	5.7	0.7	3.0	9.7	17.1	23.7	23.1	14.8	4.7
1983	13,843	37	342	985	2,343	4,046	3,790	1,903	394	5.9	0.9	3.4	10.5	18.3	23.1	22.6	15.7	4.9
1982	13,876	56	325	981	2,389	4,052	3,880	1,833	358	6.0	0.8	3.5	10.7	18.4	24.1	22.4	14.7	5.0
1981	14,712	49	321	1,084	2,657	4,343	4,090	1,787	378	6.4	0.8	4.1	11.8	19.8	25.8	22.4	16.1	5.4
1980	14,792	65	314	1,104	2,935	4,444	3,906	1,687	331	6.5	0.8	4.3	12.9	20.5	25.1	21.8	14.8	5.6
1979	14,540	62	333	1,222	3,009	4,313	3,755	1,551	293	6.5	0.9	4.9	13.1	20.1	24.5	20.4	13.5	5.6
1978	13,597	80	315	1,117	2,909	4,085	3,395	1,396	295	6.1	0.9	4.6	12.5	19.4	22.7	18.9	14.2	5.3
1977	13,911	77	357	1,184	3,104	4,199	3,389	1,353	245	6.3	1.1	5.0	13.3	20.3	23.1	18.7	12.4	5.6
1976	14,072	81	330	1,265	3,268	4,342	3,272	1,247	262	6.5	1.0	5.5	13.8	21.3	22.9	17.7	14.0	5.8
1975	14,142	101	288	1,273	3,345	4,409	3,240	1,248	236	6.6	0.9	5.6	14.1	22.0	23.2	17.9	12.9	5.9
1974	15,143	111	356	1,453	3,655	4,653	3,433	1,247	232	7.1	1.2	6.4	15.4	23.5	25.2	18.3	13.4	6.4
1973	15,385	105	350	1,585	3,798	4,766	3,320	1,230	229	7.3	1.2	7.0	16.0	24.4	25.0	18.5	14.0	6.6
1972 ³	14,860	94	366	1,608	3,774	4,540	3,002	1,262	212	7.1	1.3	7.1	16.0	23.5	23.0	19.5	13.6	6.5
1971	14,555	128	316	1,495	3,818	4,417	2,947	1,212	217	7.0	1.2	6.5	16.2	23.2	23.1	19.2	14.6	6.4
1970	14,672	146	326	1,618	3,727	4,426	2,970	1,231	225	7.2	1.3	7.0	16.0	23.7	23.8	20.0	15.9	6.6

¹ Rates per 100,000 population computed by direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940.

² Includes deaths in which age of decedent was unknown; age-specific numbers of deaths may not sum to total.

³ Deaths based on a 50-percent sample.

Table 4. Age-adjusted death rates¹ from liver cirrhosis with and without mention of alcohol by sex, race, and Hispanic origin², United States, 1970–98.

ICDA-8 code and year	All races/ origins and both sexes	Male						Female					
		White			Black			White			Black		
		All ³	Hispanic	Non-Hispanic	All ³	Hispanic	Non-Hispanic	All ³	Hispanic	Non-Hispanic	All ³	Hispanic	Non-Hispanic
Alcohol-related cirrhosis (571.0)													
1998	3.7	5.6	12.4	5.0	6.9	1.1	7.1	1.8	1.8	1.8	2.2	0.4	2.2
1997	3.8	5.8	12.6	5.2	7.2	1.8	7.4	1.8	2.2	1.8	2.7	—	2.7
1996	3.9	5.9	13.3	5.2	8.0	1.8	8.3	1.8	2.2	1.8	3.0	0.1	3.1
1995	4.0	6.1	14.2	5.3	8.8	0.6	9.0	1.8	2.2	1.8	3.2	0.3	3.3
1994	4.1	6.1	14.8	5.3	9.8	1.9	10.0	1.9	2.4	1.8	3.4	0.6	3.5
1993	4.0	5.9	14.4	5.1	9.5	2.1	9.7	1.8	2.4	1.8	3.2	0.6	3.3
1992	4.1	6.1	14.4	5.3	10.6	3.3	10.7	1.8	2.2	1.7	3.7	0.2	3.8
1991	4.2	6.0	14.4	5.2	10.6	3.4	10.6	1.9	2.6	1.8	4.3	1.0	4.4
1990	4.3	6.1			12.5			1.9			4.7		
1989	4.5	6.4			13.3			2.0			4.7		
1988	4.4	6.1			13.2			2.0			4.9		
1987	4.3	5.9			13.5			1.9			4.6		
1986	4.3	5.8			12.6			2.0			4.6		
1985	4.4	6.0			14.0			2.0			5.1		
1984	4.5	6.2			12.8			2.1			5.1		
1983	4.4	6.1			12.0			2.1			5.0		
1982	4.6	6.4			12.3			2.2			5.1		
1981	5.0	6.7			14.6			2.5			5.8		
1980	5.5	7.2			16.4			2.6			6.7		
1979	5.4	7.1			16.1			2.6			6.5		
1978	5.6	7.2			16.1			2.8			7.1		
1977	5.8	7.4			17.6			2.9			7.0		
1976	6.0	7.8			18.3			2.9			7.4		
1975	5.9	7.8			17.1			2.9			7.1		
1974	6.1	8.0			17.2			3.0			7.4		
1973	5.9	7.8			16.1			2.9			7.3		
1972 ⁴	6.0	7.8			17.1			3.0			7.2		
1971	5.7	7.5			15.5			2.8			7.1		
1970	5.4	7.2			15.1			2.7			7.1		
Other specified cirrhosis (571.8)													
1998	0.3	0.3	0.4	0.3	0.5	—	0.5	0.3	0.6	0.3	0.3	0.1	0.3
1997	0.3	0.3	0.3	0.3	0.5	—	0.5	0.3	0.5	0.3	0.4	0.2	0.4
1996	0.3	0.3	0.4	0.3	0.6	0.2	0.6	0.3	0.5	0.3	0.4	—	0.4
1995	0.4	0.3	0.4	0.3	0.6	—	0.7	0.4	0.5	0.4	0.4	—	0.5
1994	0.4	0.4	0.6	0.3	0.6	—	0.7	0.4	0.7	0.4	0.5	0.2	0.5
1993	0.5	0.5	0.6	0.4	0.8	—	0.8	0.4	0.7	0.4	0.6	—	0.6
1992	0.5	0.5	0.6	0.5	1.0	—	1.0	0.5	0.7	0.5	0.6	—	0.6

Table 4. Age-adjusted death rates¹ from liver cirrhosis with and without mention of alcohol by sex, race, and Hispanic origin², United States, 1970–98. (Continued)

ICDA-8 code and year	All races/ origins and both sexes	Male						Female					
		White			Black			White			Black		
		All ³	Hispanic	Non-Hispanic	All ³	Hispanic	Non-Hispanic	All ³	Hispanic	Non-Hispanic	All ³	Hispanic	Non-Hispanic
1991	0.6	0.5	0.6	0.5	1.0	—	1.1	0.5	0.6	0.5	0.8	—	0.8
1990	0.6	0.5			1.1			0.5			0.7		
1989	0.6	0.6			1.2			0.6			0.7		
1988	0.7	0.7			1.2			0.6			0.9		
1987	0.8	0.8			1.5			0.6			1.0		
1986	0.8	0.7			1.3			0.6			1.1		
1985	0.9	0.8			1.9			0.7			1.1		
1984	0.9	0.9			2.0			0.8			1.3		
1983	0.9	0.8			2.3			0.8			1.5		
1982	1.0	0.9			2.7			0.8			1.4		
1981	1.1	1.0			2.9			0.8			1.7		
1980	1.2	1.1			3.5			0.9			1.9		
1979	1.1	1.0			3.6			0.8			1.9		
1978	1.5	1.6			4.0			1.1			2.3		
1977	1.7	1.7			4.9			1.1			2.6		
1976	1.8	1.9			4.7			1.2			2.6		
1975	2.0	2.1			5.7			1.4			2.7		
1974	2.2	2.4			6.9			1.5			3.6		
1973	2.4	2.6			7.1			1.6			4.1		
1972 ⁴	2.3	2.5			6.8			1.6			3.6		
1971	2.5	2.8			5.9			1.7			3.6		
1970	2.6	2.9			6.3			1.8			3.9		
Unspecified cirrhosis (571.9)													
1998	3.2	4.3	7.2	4.0	5.1	0.7	5.2	2.2	3.6	2.1	2.2	0.4	2.2
1997	3.2	4.3	6.7	4.1	5.2	1.3	5.3	2.2	4.0	2.1	2.4	0.9	2.4
1996	3.2	4.3	7.7	4.1	5.2	1.0	5.4	2.2	3.7	2.1	2.3	0.7	2.3
1995	3.2	4.3	7.3	4.1	5.4	0.7	5.6	2.2	3.6	2.1	2.4	0.8	2.5
1994	3.4	4.5	7.7	4.2	5.4	0.9	5.6	2.3	4.0	2.2	2.7	0.7	2.8
1993	3.5	4.6	7.7	4.3	5.9	1.2	6.0	2.3	3.7	2.3	2.8	0.4	2.9
1992	3.4	4.6	7.6	4.3	5.7	0.8	5.9	2.3	4.3	2.1	2.6	0.4	2.6
1991	3.6	4.8	7.9	4.5	5.9	1.2	5.9	2.4	4.4	2.3	3.2	0.7	3.2
1990	3.7	4.9			6.3			2.4			3.3		
1989	3.9	5.2			6.8			2.6			3.4		
1988	4.1	5.6			6.9			2.6			3.7		
1987	4.2	5.6			7.4			2.7			3.7		
1986	4.3	5.8			7.3			2.9			3.6		
1985	4.4	6.0			7.7			2.9			3.9		
1984	4.7	6.3			7.8			3.0			3.9		
1983	4.9	6.6			8.6			3.1			4.3		

Table 4. Age-adjusted death rates¹ from liver cirrhosis with and without mention of alcohol by sex, race, and Hispanic origin², United States, 1970–98. (Continued)

ICDA-8 code and year	All races/origins and both sexes	Male						Female					
		White			Black			White			Black		
		All ³	Hispanic	Non-Hispanic	All ³	Hispanic	Non-Hispanic	All ³	Hispanic	Non-Hispanic	All ³	Hispanic	Non-Hispanic
1982	5.0	6.9			8.1			3.1			4.3		
1981	5.4	7.3			9.3			3.5			5.1		
1980	5.6	7.4			10.1			3.6			5.5		
1979	5.6	7.5			10.5			3.5			4.9		
1978	5.3	7.2			10.3			3.3			4.9		
1977	5.6	7.6			10.5			3.4			5.5		
1976	5.8	7.8			10.8			3.6			5.3		
1975	5.9	8.0			11.1			3.6			5.6		
1974	6.4	8.6			11.8			4.1			6.2		
1973	6.6	8.9			12.0			4.1			7.0		
1972 ⁴	6.5	8.7			12.7			4.0			6.9		
1971	6.4	8.6			10.8			4.2			6.3		
1970	6.6	8.7			11.5			4.2			6.8		

— There were no deaths in this table cell.

- 1 Rates per 100,000 population computed by direct method, using as the standard population the age distribution of the total population of the United States as enumerated in 1940.
- 2 Excludes deaths for which Hispanic origin was unknown and all 1991 through 1996 deaths from Oklahoma and New Hampshire where Hispanic origin was unknown in more than 90 percent of all cirrhosis deaths. Data on Hispanic origin not shown for years earlier than 1991.
- 3 Includes deaths for which Hispanic origin was unknown.
- 4 Deaths based on a 50-percent sample.