

Dying in Alabama: Leading Causes and Factors

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ABSTRACT- *This report is designed to: (1) analyze death rates and mortality trends in Alabama over the last 60 years; (2) examine how deaths vary within the state according to such biological and social factors as age, race, sex, level of education, and region of residence; and (3) review selected causes of death in Alabama. In addition, factors such as when deaths occur, marital status, disposition of the body, and infant mortality will be addressed. The data used in this report were drawn from birth and death certificates maintained by the Center for Health Statistics, Alabama Department of Public Health.*

Alabama's death rate is rising due to the aging of its population, but Alabamians are living longer than in the past. Men have higher death rates than women and whites have higher rates than blacks and people of other races. More deaths occur during the winter months than any other time of the year. Married people exhibit lower death rates than single, divorced, or widowed persons and most bodies are buried rather than cremated. The infant mortality rate has been on a downward spiral since 1940, but Alabama's infant death rate continues to be one of the highest in the nation. The leading causes of death in Alabama are heart disease, cancer, strokes, accidents, and lung disease. Homicide rates have declined slightly over the years, while suicide rates have moved in the opposite direction. The risk of dying from heart disease, cancer, stroke, accidents, and suicide all increase with age. Thus, the Alabama counties with the highest death rates also exhibit the highest percentage of residents aged 65+.

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HIGHLIGHTS

(All Statements Refer to the Statewide Population)

- The average life expectancy at birth in Alabama in 1998 was 74.0 years, a gain of eight years over the last half-century.
- Because there are more elderly people in Alabama than in the past, the total number of deaths has increased and the crude death rate is at its highest level since the 1930s. When differences in the age structure are taken into consideration, however, people today are dying at a lower rate than their counterparts of a half-century ago.
- Men are more likely to die than women at all ages and almost three times as likely to die at 15-24. The healthiest age in Alabama (lowest death rates for both males and females) is 5-9.
- The mortality rate for blacks and people of other races was higher than that for whites until 1993. At that point, rates crossed and whites now have a higher crude death rate than blacks and others.
- When differences in age structure are taken into consideration, however, blacks and other races continue to exhibit significantly higher mortality rates than whites.
- Blacks and other races have higher mortality rates than whites for every age group except 15-19. However, black females have lower death rates than white males at every age.
- Because of respiratory infections, there are more deaths in the winter months than at any other time of the year. The healthiest month in Alabama (i.e., fewest deaths) is August, while the most unhealthy month (most deaths) is January.
- Marriage helps to reduce the chances of death. Thus, mortality rates are lower for married persons than any other marital-status category in the population.
- Slightly less than half of those who died in 1998 had not graduated from high school, reflecting the lower levels of educational attainment of the older generation. Educational attainment levels will continue to rise in Alabama, therefore, principally as a result of the high death rate in its older, least educated citizens.
- The infant mortality rate has dropped dramatically since 1940, but Alabama continues

to have one of the highest infant death rates in the nation. The rate for black and other race infants is over twice as high as that for white infants.

- Heart disease was the leading cause of death in Alabama in 1998, (and has been since 1926), followed by cancer and cerebrovascular diseases (or "strokes").
- Death rates from heart disease for blacks and others are significantly higher than those for whites. Although this disease is perceived to be a more serious threat for men than women, more women in Alabama die from heart disease than men.
- Seventy percent of all cancer deaths are to persons aged 65+, while less than 5 percent involve those under 45. While males have a higher death rate from cancer than females, the rate for women is rising faster than that for men.
- Although Alabama's rate of death from strokes has declined significantly in recent years, it is included in a grouping of southern states (known as the "stroke belt") with elevated rates of death from this disease.
- Females, blacks and other races, and the elderly are more likely to die from strokes than other components of the population. Women account for four-fifths of all deaths from this disease.
- People aged 75+ have the highest death rate from accidents of any age category in Alabama, but accidents are the leading cause of death in all age categories from 1–34. Motor vehicle fatalities comprise over half of all accidental deaths in Alabama in 1998.
- Persons aged 20-29 accounted for one-third of all homicide deaths in 1998, while black and other race males totaled nearly half of all homicide victims in that year.
- Homicide is the leading cause of death for blacks and people of other races between the ages of 15 and 24.
- The elderly, whites, and males are more likely to die from suicide than younger people, blacks and other races, and females. White males are much more likely to commit suicide than any other group in the population.
- Rates of death in Alabama from heart disease, cancer, strokes, accidents, homicide and suicide all exceed those for the United States as a whole. The rate of death from homicide, for example, is nearly twice that for the U.S.
- The Alabama counties with the highest death rates also have the highest percentage of residents aged 65+.
- Although 94 percent of those dying in 1998 were buried in the conventional manner,

cremation is becoming increasingly common.

Dying in Alabama: Leading Causes and Factors

Introduction

Mortality is one of the three components of population change, along with natality and migration. Who dies and when they die is far from a random process. Certain behaviors are associated with a higher risk of dying. For example, those who smoke and drink alcohol excessively, lead sedentary lifestyles, and engage in high-risk occupations and dangerous recreational pursuits are more likely to die than those who do not participate in these activities.

The last century has witnessed a major transformation in the mortality process. Mortality rates were much higher at every age in the past than they are now. For example, infants were over 6.5 times more likely to die in 1940 than they were in 1998. Also, the reasons for dying (or the "causes of death") are much different today than in the past. In the 19th century, a large number of people died of infectious diseases such as smallpox, diphtheria, typhoid, malaria, tuberculosis, polio, pertussis, and other communicable diseases. Improved sanitation and nutrition, immunizations, and other public health efforts have significantly reduced the incidence of these diseases. Now, most people die of chronic diseases associated with old age or from unintentional injuries (i.e., "accidents").

Despite these improvements, there are still major differences in mortality for distinct age, race, sex, and socioeconomic groups within the population. These differences will be examined in this report.

MORTALITY TRENDS

Crude Death Rate

Alabama's crude death rate in 1998 was 10.6 deaths per 1,000 population. A total of 43,905 Alabamians died that year. The 1998 death rate marks the state's highest rate since the 1930s. A major reason for the elevated death rate is an aging population, with the probability of dying increasing greatly for those in the older age groups.

Despite the fact that the crude death rate is higher than in the past, Alabamians can expect to live longer than at any time in the state's history. In 1998, the average life expectancy at birth was 74.0 years, compared to 66.2 in 1950.

Age Specific Mortality

Mortality is highly related to age. [Figure 1](#) contains the age-specific mortality curve for the Alabama population in 1998. As can be seen, mortality is relatively high in the first year of life.

More infants die than all children aged 1-19 combined and infants have a higher death rate than any other age group up to 60-64 years. The lowest death rate, on the other hand, is for those aged 5-9. After ages 5-9, the curve then rises for each successive age group and peaks for those aged 85+, with a rate of 158.1 per 1,000 population.

Over half of all deaths occur to those aged 75+, with the median age at death at 75.9 years. Almost a quarter of those who died in 1998 were aged 85+. Indeed, the death rate almost doubles between the 80-84 age group and persons aged 85+.

Since age is so closely related to mortality, mortality rates are frequently adjusted when making comparisons involving various population segments. Age-adjusted mortality rates, however, have no real meaning within themselves. Instead, they are theoretical constructs that enable one to compare two populations as if they had the same age distribution. In other words, the adjustment process removes the effect of age from mortality rate comparisons.

The effects of adjusting for age can be seen in [Table 1](#) and [Figure 2](#). The crude death rate is greatly influenced by the aging of the population, since the probability of dying is so highly correlated with age. As the population of Alabama has aged since 1950, the crude death rate also has increased. However, the age-adjusted rate has declined steadily over the years, with the steepest drops occurring in the 1970s. The decline in the age-adjusted death rate has slowed since 1985, but the crude death rate has increased dramatically.

Looking at the crude death rate alone, it appears that people would be more likely to die now than at any time since the 1950s. Indeed, more Alabamians are dying today than at any time in the past, but there are many more elderly people in the population (hence, more people susceptible to death). The age-adjusted rates, however, tell a much different story. Thus, when the age composition of the population is held constant, people today are much less likely to die than their counterparts of 50 years ago.

MORTALITY CHARACTERISTICS

Sex Differentials

Dramatic differences exist in mortality rates between the sexes. Males are 9 percent more likely to die than females, with rates of 11.1 deaths per 1,000 males versus 10.1 for females. Men work in occupations with a higher risk of work-related injury and death, and participate in recreational activities that are more likely to result in death. In addition, they are more prone to engage in behaviors like smoking, drinking and drug use, which are associated with lower life expectancies. Men are less likely than women to obtain medical checkups and receive preventive care, which could detect conditions such as diabetes, hypertension, cancer, and hardening of the arteries and lead to earlier treatment and control.

[Table 2](#) presents mortality rates for males and females and the ratio of these rates to each other. At every age, males are more likely to die than females. The smallest difference is for

infants, where male babies are only 4 percent more likely to die than female infants. The greatest difference is for those aged 15-24, wherein males are almost three times more likely to die as females. During that age, 518 males died in 1998 compared to only 182 females. Much of this difference is due to the greater likelihood that males will die from accidents, suicide, and homicide. Mortality rates for males aged 25-34 are more than twice as high as those for females. In fact, male mortality rates are 50 percent higher than female rates for all ages except infants and those aged 85+.

Prior to the 20th century, mortality rates for females in their 20s and 30s were often higher than those for males of that age because of pregnancy-related mortality. Now, relatively few deaths occur due to pregnancy-related causes and male rates in those age groups now greatly supersede those for females.

A major reason that the overall death rate for males is only 9 percent greater than that for females is that the female population exhibits an older age distribution. Thus, more females than males are in the ages where death rates are higher. This can be readily observed when male and female death rates are age-adjusted. The age-adjusted male death rate, for example, was 7.5 in 1998, or 67 percent higher than the female adjusted rate of 4.5. This percentage is much closer to the average age-specific mortality differential than is indicated by the overall difference in mortality rates.

Race

The mortality patterns of whites are significantly different from those of blacks and people of other races. The crude death rate for whites (at 10.8 per 1,000 population) is more than 9 percent higher than the 9.9 rate for blacks and other races. In fact, the white rate has been higher than that for blacks and others since 1994. In 1940, the rate for blacks and other races (at 14.1 per 1,000) was 66 percent higher than the rate for whites (or 8.5 per 1,000). As indicated in [Figure 3](#), however, the rates have converged over time and actually crossed in 1993. Overall, white mortality rates have been rising since 1980, but rates for blacks and others have been essentially unchanged since 1990.

The major reason that the white mortality rate is higher than the black and other rate is differences in the age structure of the two populations. [Figure 4](#) illustrates the age specific mortality rates for these two groups, while [Table 3](#) presents age specific death rates by race and illustrates (ratio column) the excess mortality that characterizes the black and other race population. In 1998, black infants died at a rate 80 percent higher than that for whites. In fact, death rates for blacks and others were higher than white rates for all ages except 15-19. Here, the higher rate for whites is accounted for largely by an elevated death rate from motor vehicle accidents. White teenagers are more likely to drive and to have access to a car than black and other race teenagers and, as a result, experience more fatal accidents. The greatest difference in race-related deaths is for the 25-29 age group, where black and other race mortality is 2.2 times higher than white mortality. The mortality differential is more than 50 percent higher for blacks and other races than for whites for all but a few age groups.

Table 4 shows the age-adjusted death rates for whites compared to those for blacks and other races, as well as white versus black and other ratios of age-adjusted mortality rates. While the crude death rate in 1998 was 8 percent lower for blacks and others than whites (**Table 3**), the age-adjusted rate for this group was 43 percent higher (**Table 4**). In every year, the excess mortality rate for blacks and others was at least 39 percent compared to whites and it was 62 percent in 1950.

For both races, male mortality exceeds female mortality. Among whites, the male mortality rate (at 11.1 per 1,000 population in 1998) was 5.7 percent higher than the rate for females (10.5). The age-adjusted death rate, which takes the older age structure of the white female population into consideration, yielded an even greater differential. Thus, the rate for white males (6.9) was 68.3 percent greater than the rate for white females (4.1). The crude death rate for black and other males (10.9) was almost 20 percent higher than the female rate (9.1). After adjusting for differences in age, however, the rate for black and other race males (10.1) exceeded the rate for black and other race females (5.8) by 74.1 percent. Interestingly, the rates for black females (both crude and age-adjusted) are lower than those for white males.

Season of the Year

Deaths are not evenly distributed throughout the year. Instead, there are distinct seasonal variations. In 1998, the largest number of deaths in Alabama (an average of 134 per day) occurred during the winter months. Next, was the fall (an average of 120 deaths per day), followed by the spring (116), and the summer (110).

Alabamians are most likely to die in January than any other month (an average of 142 deaths per day in 1998), but least likely to die in August (an average of 107). The second most deadly month in 1998 was February (136 deaths per day), followed by March and December (with 126 deaths each). September had the second least number of deaths (110 per day), followed by July (111). January 8th was the day when the most deaths occurred in 1998 (170), with the fewest on May 29th (when only 85 people died).

The winter months display the highest death rates because respiratory infections such as influenza and pneumonia are more common during these months. Older people, whose resistance is generally less than that for younger people, are particularly susceptible to these diseases.

Marital Status

Among Alabama residents aged 25+ who died in 1998, 42.4 percent were married, 39.8 percent were widowed, 10.5 percent were divorced, and 7.4 percent had never married. The relationship between marital status and age, however, varied greatly according to age group. The modal category for those dying between the ages of 25-34, for example, was "never married" with 44.9 percent of all decedents of that age. Those dying between the ages of 35-74 were typically married, but of those aged 75-84 at the time of death almost half were widowed.

The number of persons who were widowed approached almost three-fourths of all decedents aged 85+.

Research has shown that marriage has a protective effect against death. Thus, those who are married have lower mortality rates than others of similar age and sex who have never married or who are divorced or widowed.

Blacks and other race decedents in 1998 were about 2.5 times more apt to have never married as whites who died that year. Blacks and others were also more likely to be widowed or divorced than whites. Among whites who died in 1998, 45 percent were married compared to only one-third of blacks and others.

Educational Attainment

The low educational attainment levels of Alabamians dying in 1998, almost half (47.9 percent) of whom had not graduated from high school, reflects the early 20th century pattern of dropping out of school prior to graduation. Only about a third of those dying in 1998 had graduated from high school and not attended college. Less than 20 percent had completed one or more years of college. Of persons aged 85+, 59.5 percent had less than a high school education, while nearly 70 percent of those aged 25-39 had at least a high school diploma.

Among black and other race decedents in 1998, 58.9 percent had not completed high school. This reflects the extreme discrimination that blacks faced during the first half of the 20th century. In comparison, only 44.4 percent of white decedents had not completed high school.

Research has shown that people with higher levels of educational attainment tend to live longer than those with fewer years of schooling. More highly educated people are more likely to utilize health services more often and more effectively, adhere to preventive health care, and to follow good health practices.

Deaths to Infants

Deaths to infants are of particular interest because the infant mortality rate is often used as a measure of the general health of the population, as well as an indicator of the overall level of societal development. Over the last decade, Alabama's infant mortality rate has been among the highest in the nation. According to figures from the National Center for Health Statistics, Alabama (at 10.2 deaths per 1,000 live births) had the highest infant mortality rate of any state in 1998. Still, Alabama has made remarkable progress in reducing infant mortality over the years. The rate in 1940, for example, was 61.3, or almost six times higher than the rate in 1998 (see [Figure 5](#)). In fact, Alabama's infant mortality rate has declined by one-third since 1980.

The rate for black and other race infants in 1998 (at 15.4 deaths per 1,000 live births) was 103 percent higher than the rate for white infants (7.6). The rates for all age groups of black and other mothers far exceeded those for all age groups of white mothers (see [Figure 6](#)). Rates

were highest for infants of black and other race mothers aged 35+ and lowest for white mothers aged 20-34. Babies of teen mothers generally have a higher likelihood of dying during infancy than mothers of other ages.

The leading cause of deaths for infants in 1998 was congenital anomalies (or "birth defects"), with 116 infants in Alabama dying from this cause. Other major causes of infant death were disorders related to short gestation and low birth weight, Sudden Infant Death Syndrome (SIDS), and Respiratory Distress Syndrome (RDS).

Infant mortality is highly related to socioeconomic status. Babies born to lower social class mothers, those who are receiving Medicaid benefits, and those who are characterized by lower levels of educational attainment are more likely to die as infants than those born to mothers with private insurance or higher levels of schooling.

The frequency and quality of prenatal care is critical in preventing infant deaths. Babies whose mothers do not receive adequate prenatal care are over three times as prone to die as those whose mothers receive quality prenatal care. Thus, the infant mortality rate in 1998 for babies of mothers who received no prenatal care was 78.4 per 1,000 live births compared to 9.1 for those who had at least one prenatal care visit.

Mothers can take a number of steps to insure a healthy pregnancy and baby. They can take vitamins before and during pregnancy, especially vitamins with folic acid, which help to prevent birth defects. They can begin prenatal care early and attend all of the recommended visits to physicians. Pregnancy related-conditions, such as gestational diabetes, toxemia, or pregnancy-related hypertension, can then be detected and treated in a timely fashion. Mothers can also avoid smoking, drinking, and taking drugs that are harmful to the fetus. After the baby is born, mothers should put the baby to sleep on its back and avoid smoking around the child in order to help prevent SIDS.

LEADING CAUSES OF DEATH

In order to answer the question of "why people die," researchers and medical specialists have developed the International Classification of Diseases. The ninth revision of this resource, which lists over 4,000 categories of death and morbid conditions, is designed to specify as closely as possible the cause of death for each individual. (See [Cause of Death Classification in Appendix II](#)).

A list of the 10 leading causes of death in Alabama is tabulated each year. Deaths are rank-ordered according to the total number of persons dying from each cause. The leading causes of death have changed dramatically over the last century. In 1895, the five leading causes of death in Alabama were: tuberculosis, pneumonia, heart disease, malarial diseases, and dysentery ([Table 5](#)).

Four of these five major causes of death were due to infectious agents, easily spread because of the lack of sanitation. The sanitary movement, which began in the second half of the 19th century and continued through the first half of the 20th century, has greatly reduced the prevalence of these conditions. Prevention efforts by public health workers are responsible for 25 years of the nearly 30 years improvement in life expectancy in the U. S. since 1900. The life expectancy of an infant born in the U.S. in 1900 was only 47.3 years. By 1998, however, life expectancy had increased to 76.7 years. At 74.0 years, life expectancy in Alabama is a little less than that for the U.S. Increases in life expectancy since the 1960s have been due mainly to reductions in chronic diseases rather than infectious diseases.

The five leading causes of death in Alabama in 1998 were diseases of the heart, malignant neoplasms (cancer), cerebrovascular diseases (strokes), accidents, and chronic obstructive pulmonary diseases and allied conditions (or "diseases of the lung"). The top three causes are chronic diseases; hence, a reflection of the increased life expectancy in Alabama.

Heart Disease

There were 13,449 deaths attributed to diseases of the heart in 1998, making this Alabama's leading cause of death. Thirty-one percent of all deaths were due to this factor. Heart disease became Alabama's leading cause of death in 1926. With a current mortality rate of 108.4 per 100,000 population, it continues to account for more deaths than any other cause.

Prior to 1987, Alabama's rate of mortality from heart disease was below that for the nation. Since 1987, however, Alabama's rate has exceeded the national rate by a growing margin. In 1998, the Alabama rate was 323.7 per 100,000 population, compared to 268.0 for the United States (Figure 7).

An analysis of age-specific mortality rates reveals that heart disease ranks in the top-five major causes of death for each age group beginning with the 5-14 category and continuing through the 75+ age group. While the crude rate for heart disease has remained fairly stable over the years, the age-adjusted rate has been declining.

Because of the different age structure of the two major racial groups in Alabama, death rates from heart disease for blacks and other races have been below those for whites since 1967. Alabama's death rate for whites in 1998 was 339.4 per 100,000 population, or 21 percent higher than the 280.2 rate for blacks and others. When age-specific heart disease death rates are calculated by race and sex, however, they are much higher for blacks and people of other races than whites in all age categories. The disparity is larger for black and other race women compared to white women than for black and other race men compared to white men (Figure 8).

Perceptions still exist that heart disease is not as serious for women as it is for men. The population of U. S. women is growing and becoming older more quickly than the male population, so the actual number of women who die from heart disease will continue to grow.

Women develop heart disease and die from it at later ages than men, but the actual number of women who die from heart disease in Alabama is larger than the number of men dying from this cause. In 1998, 6,887 women died from heart disease, while the corresponding number was 6,562 for men. Diseases of the heart accounted for 31.5 percent of all deaths in women in that year and 29.8 percent of the deaths for men.

Cancer

The second leading cause of death in Alabama in 1998 was malignant neoplasms, or cancer. A total of 9,687 Alabama residents (or 233.1 per 100,000 population) died from cancer during that year. This compares to 199.4 per 100,000 for the U. S. Thus, the national rate in 1998 was only 86 percent of the rate for the state. Alabama's death rate from cancer has doubled since 1960 when it was only 117.1 per 100,000. Cancer accounted for 22.1 percent of all deaths in the state during 1998. As with heart disease, Alabama's cancer mortality rate was lower than that for the U. S. prior to 1986. Since that time, however, the Alabama rate has exceeded the national level.

When age-specific mortality rates are examined, older Alabamians have a much higher death rate from cancer than their more youthful counterparts. Thus, the 75+ age group posted a cancer death rate of 1,517.7 per 100,000 in 1998 compared to 912.1 for those aged 65-74. Almost 70 percent of all cancer deaths in that year were to persons aged 65+, while less than 5 percent were to those under 45. The age-adjusted death rate for cancer has been fairly constant over the years.

White Alabamians have a higher death rate due to cancer than blacks and other races. In 1998, the cancer death rate for whites was 243.1 per 100,000, compared to 205.5 for blacks and other races. This reflects in part the older age structure of the white population.

Males continued to exhibit both a higher number of deaths and a higher death rate from cancer than females, particularly for cancer of the bronchus and lung and of the esophagus. Over the last ten years, however, the cancer death rate for females has risen 18.9 percent compared to 12.2 percent for males. Cancer of the bronchus and lung was the leading cause of cancer death in 1998 for both men and women. It is estimated that cigarette smoking is directly responsible for almost 90 percent of all new lung cancer cases each year. In the United States, more men smoke than women, but the discrepancy between the two has been decreasing each year. The top three sites relative to causes of death from cancer are the lung, breast, and large intestine for women and the lung, prostate, and large intestine for men ([Figure 9](#)).

Strokes

The third leading cause of death in Alabama is cerebrovascular disease, more commonly known as "stroke." There were 2,936 deaths from strokes in 1998, or 70.7 per 100,000 population. They accounted for 6.7 percent of all deaths that year. The stroke death rate rose slightly from 1997 to 1998 (from 70.6 to 70.7), but the current rate is still only about half that for 1970 (or

133.9 per 100,000). And the decline in age-adjusted death rates from strokes is even more impressive. Still, Alabama is included in a grouping of southern states known as the "stroke belt" because its residents exhibit a higher risk of dying from strokes than those in other parts of the country. In 1998, Alabama's death rate from strokes exceeded the national rate of 58.5 by 12.2 deaths per 100,000 population (or 21 percent). (See [Figure 10](#)).

The likelihood of succumbing to a stroke increases with age, with two-thirds of all deaths involving people aged 75+. Historically, black and other race residents have had a greater risk of dying from strokes and have died at younger ages than whites ([Figure 10](#)). During the last decade, the white death rate from strokes remained relatively stable, ranging from a low of 63.1 in 1994 to a high of 70.6 in 1997. Over the past 30 years, however, the black and other race death rate from cerebrovascular diseases has remained higher than that for whites. From 1990-98, the black and other rate ranged from a low of 67.7 in 1994 to a high of 88.2 in 1990. The difference between the races, however, has been declining. In 1970, the rate was 49.5 percent higher for blacks and other races versus whites compared to only 3.6 percent more in 1998. The stroke death rate for blacks and other races was marginally higher than the white rate in 1998, or 72.5 per 100,000 population compared to 70.0.

Women have a higher risk of dying from strokes than men, largely as a result of their older age structure. Thus, the stroke death rate for females in 1998 was 82.5 per 100,000 Alabama residents, compared to 57.7 for males. Women, furthermore, accounted for 60.8 percent of all statewide deaths from strokes during that year.

Accidents

Accidents, or unintentional injuries, have been the fourth leading cause of death in Alabama since 1949. In 1998, 2,209 Alabama residents died from accidents for a rate of 53.2 per 100,000 population. Since 1960, both the national and state rates have declined, but Alabama's rate of death from accidents has exceeded the national rate since 1951. There was a slight decrease in the state's overall accidental death rate from 1997 to 1998 (from 55.9 to 53.2), including a decline for both whites and blacks and others.

When age-specific patterns of accidental death are analyzed, the data reveal that accidents were the leading cause of death in 1998 for Alabamians aged 1 to 34, the second leading cause for those aged 35-44, and the third leading reason for persons aged 45 to 64. Moreover, the 75+ age group had the highest age-specific death rate from accidents of any age category in Alabama in that year.

Motor vehicle deaths were by far the number one cause of deaths due to accidents in 1998, accounting for 51.4 percent of all accidental deaths. Falls, the second leading cause of accidental death, comprised 9.4 percent of the total. Suffocation, poisoning, and drowning each accounted for about 5 percent of all accidental deaths.

Homicide

There were 463 homicide deaths in Alabama in 1998 for a rate of 11.1 per 100,000 population. This was the lowest rate since 1984. Homicide rates in Alabama have been higher than those for the nation as a whole since 1960. In 1998, for example, the homicide rate for the United States was 6.4, or only 58 percent of the Alabama rate (Figure 11).

The largest number of homicide deaths involves those aged 20-29. In 1998, this age group accounted for one-third of all homicide deaths (or 142). Black and other race males totaled 71 percent of the homicides in this age group. The median age at death due to homicide in 1998 was 38 for white victims, but only 28 for black and other race victims.

Black and other race males accounted for nearly 45 percent of all homicide victims in 1998. An additional 26 percent of the victims were white males, while the remaining 29 percent were women. Fourteen percent involved white women and 15 percent were black and other race women. There was a significant decrease in the black and other homicide rate from 1997 to 1998 (from 32.2 to 25.1), but a slight increase in the white rate (from 6.0 to 6.1). Homicide is the leading cause of death for blacks and other races in the 15-19 and 20-24 age groups.

Suicide

The ninth leading cause of death in Alabama in 1998 was suicide. There were 567 suicide deaths that year, or 13.6 per 100,000 population. The number of suicides increased from 531 in 1997 to 567 in 1998 for a 7 percent gain. The state's suicide rate was relatively stable throughout the 1990s, however, fluctuating between 13-14 deaths per 100,000 population. Alabama's rate was lower than the national rate until the late 1980s, but has exceeded the national rate since. In 1998, the national rate was 10.8 suicides per 100,000 population compared to 13.6 for Alabama (Figure 12).

The suicide rate for Alabamians aged 75-84 in 1998 (at 23.4) was higher than that for any other age group. However, the largest number of suicides (123) occurred in the 40-49 age group, which accounted for 22 percent of all suicide deaths. Of the 123 deaths recorded for this age category, 88 (or 72 percent) were for white males. Teens (with 31 suicides) totaled 5.5 percent of all suicide deaths in Alabama in 1998. Persons aged 65+ accounted for more than 20 percent of the state's suicides from 1991-98.

Suicide rates for white Alabamians have exceeded those for blacks and other races since 1960. In 1998, the white rate was 16.3 per 100,000, while the black and other race rate was only about a third (at 6.2) of the white rate (Figure 12). White males had the highest suicide rate by far (26.8 per 100,000 population), followed by black and other males (11.7), white females (6.4), and black and other females (1.5). Hence, suicide is exceedingly rare among black females. Males, however, accounted for 81 percent of all suicides in Alabama in 1998 and, among teenagers, all of the suicides were committed by males.

GEOGRAPHICAL DISTRIBUTION OF DEATHS

Geographically, the highest death rates are found in the northwestern and northeastern sectors of the state, as well as a selection of counties in the south-central portion of Alabama (Figure 13). These are also the counties with the highest percentage of persons aged 65+.

The counties with the lowest death rates are scattered throughout the state, but there is a concentration of low mortality counties in the north-central region of Alabama. Not surprisingly, these counties also exhibit a low proportion of older persons.

The state's major metropolitan counties exhibit interesting variations in mortality patterns. Of these, Jefferson displays the highest crude death rate (11.5 deaths per 1,000 population) followed by Mobile (10.1). Both of these counties have a large number of older persons. Indeed, almost 16 percent of the state's elderly live in Jefferson County, while almost 9 percent reside in Mobile County. Montgomery, Madison, and Tuscaloosa counties, on the other hand, display the lowest rates (all under 10.0 per 1,000 population). The county with the highest crude death rate in 1998 was Crenshaw (at 15.3 deaths per 1,000 population), while the county with the lowest was Shelby (6.3). Shelby also has the lowest percentage of elderly persons (at 8 percent) of any Alabama county.

DISPOSITION OF BODIES

Once a person has died, a decision must be made concerning the disposition of the body. The overwhelming majority of bodies (94.0 percent in 1998) are buried. The second most popular method of disposal is cremation (1.5 percent of all bodies). Some people donate their bodies for scientific purposes or for organ donation. In 1998, 168 bodies were designated for these purposes. Over time, cremation has become a more popular alternative for Alabama residents. Thus, the number of cremations increased from 939 in 1990 to 1,731 in 1998, an 84 percent rise.

CONCLUSIONS

Death and dying are not random occurrences. Thus, the chances of dying are directly related to such social and biological variables as sex, race, age, and socioeconomic standing. These factors also affect how long a person lives and the quality of one's life while one is alive. Although death is inevitable, it can be delayed by practicing good health habits and taking reasonable safety precautions. Regular medical checkups, for example, can assist in the detection of potentially serious health conditions such as diabetes, hypertension, asthma, cancer, and depression, all of which can be at least partially controlled by proper medication, diet, and treatment. Another important way to avoid premature death is to not drink and drive or go boating while intoxicated. Alcohol consumption is closely related to both motor vehicle accidents and drowning. Smoking, on the other hand, is highly associated with lung cancer, emphysema, and many other health problems. Regular exercise and healthy eating patterns are also important in avoiding death from heart disease and cancer. Lowering cholesterol levels can help prevent the clogging of arteries, a condition that significantly enhances the likelihood of strokes and heart attacks.

The development of a healthier Alabama largely depends on the habits and practices of its individual citizens. It is up to each of us to take the responsibility for determining our own destiny in the health-related arena. While all of us will eventually die, the decisions that we make regarding diet and lifestyle considerations can delay the inevitable for many years. Short changing others is generally considered to be a serious crime throughout Alabama and across the country, but it's perfectly okay to rob the Grim Reaper of as many years as possible.

APPENDICES

I. Example of Age Adjustment

Mortality rates are often age-adjusted to allow the comparison of rates for two populations with different age structures. The resulting rates have no intrinsic meaning within themselves and do not reflect the mortality experience of actual populations. Instead, they represent hypothetical rates that populations would have if they both had the age structure of a standard population. They, in effect, remove the effects of age when comparing mortality rates. The following steps are involved in computing age adjusted mortality rates (See [Table A-1](#)):

Step 1: Generate the number of deaths by age group (Column 2, [Table A-1](#)).

Step 2: Assemble population totals for these same age groups (Column 3).

Step 3: Calculate age specific death rates by dividing the number of deaths for each age group by the population of that age group (Column 4).

Step 4: Assemble population data for the standard population (Column 5). In the example provided, the U. S. "standard million" is the population that is used.

Step 5: Multiply the calculated mortality rates by the standard population for each age group in order to obtain the expected number of deaths (Column 6).

Step 6: Sum the number of expected deaths, divide by 1,000,000, and multiply by 1,000.

In this example, the age-adjusted mortality rate for 1998 for Alabama is 5.8 deaths per 1,000 population.

II. Cause-of-Death Classification

Each state collects information on the vital events (births, deaths, and fetal deaths) that occur within its boundaries and reports that information to the National Center for Health Statistics (NCHS), U. S. Department of Health and Human Services. The information from each state is then aggregated in order to produce a national database of health statistics. So that health-related data will be standardized, NCHS has developed a U.S. Standard Certificate for each vital event (birth, death, fetal death, etc.). These "model certificates" are, in turn, used by the states

to create their own individual certificates. The medical certifier (i.e., the physician, coroner, or medical examiner who signs the death certificate) completes the medical certification portion of the certificate. The *immediate cause of death* is stated on Part I, line a, of the death certificate. This is the final disease or condition resulting in the death. Any other conditions that led to the *immediate cause* are listed on lines b, c, and d. The *underlying cause of death*, or the disease or injury that initiated events resulting in the death, is entered on the line below any of the other immediate conditions that contributed to the death. Thus, for example, pneumonia may have been the immediate cause of death, but congestive heart failure was actually the underlying cause. It is the underlying causes of death that have been analyzed in this report.

The cause of death data that are assembled by the Alabama Center for Health Statistics are based on World Health Organization (WHO) regulations. These regulations "specify the format of the medical cause of death on the death certificate, provide definitions, and define the procedures to be used in coding causes of death" (Murphy, 2000). Prior to 1968, mortality data were coded manually based on the underlying cause of death. Beginning with data collected in 1968, the National Center for Health Statistics began coding the underlying cause(s) of death by computer. This system was called "Automated Classification of Medical Entities" (ACME). Alabama provided multiple causes of death (where applicable) to NCHS electronically. ACME then selected the underlying cause from the multiple cause codes based on WHO rules. Beginning with 1990 data, the coding of multiple underlying causes of death was automated by the Mortality Medical Indexing, Classification, and Retrieval system (MICAR). ACME now selects the underlying cause of death based on the sequence of conditions listed on the death certificate by the certifier, the rules and modifications provided by NCHS, and input from MICAR.

Figure 1
Death Rates by Age, Alabama, 1998

Death Rates by Age, Alabama, 1998

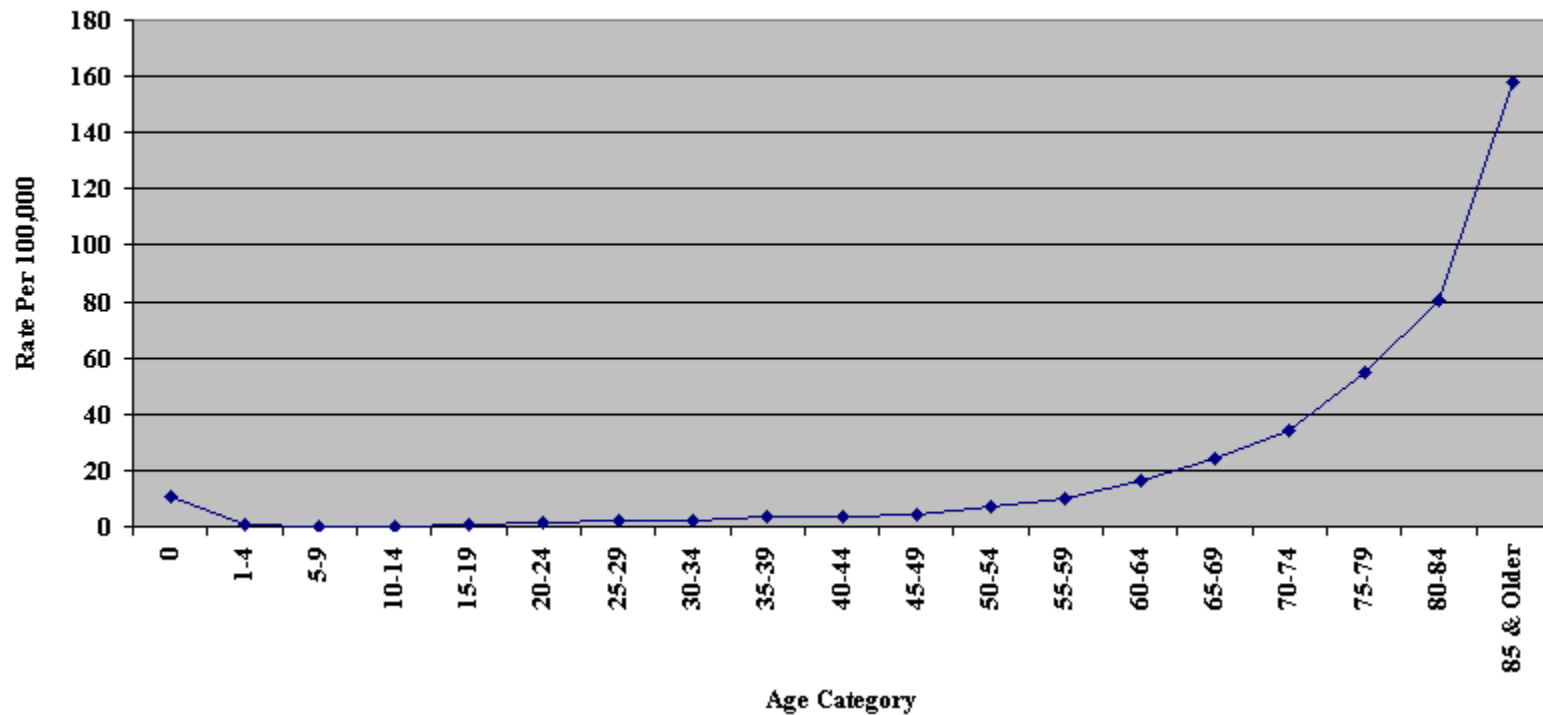


Figure 2
Crude and Age-Adjusted Death Rates, Alabama, 1950-1998

Crude and Age-Adjusted Death Rates, 1950-1998

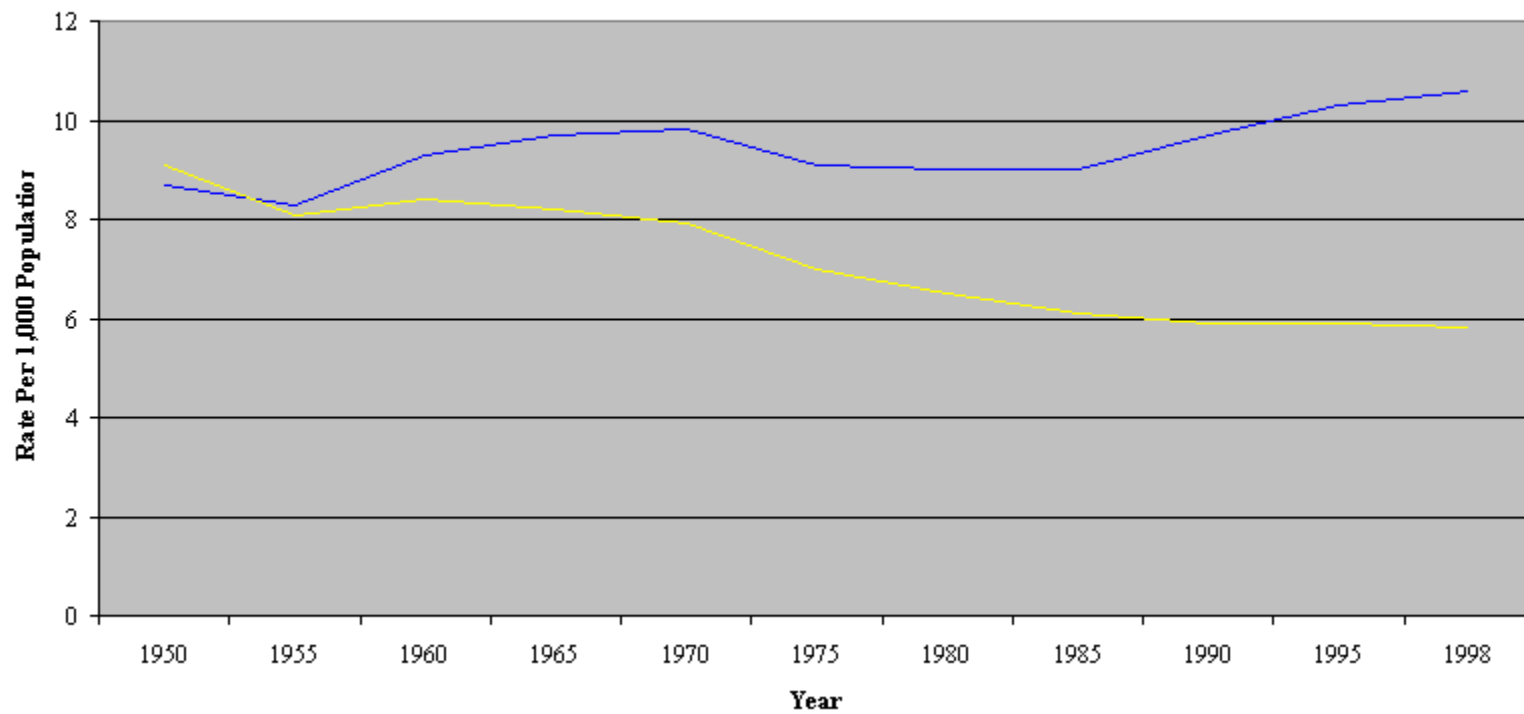


Figure 2

**Crude and Age-Adjusted Death Rates,
Alabama, 1950-1998**

	Crude Death Rate	Age-Adjusted Death Rate
1950	8.7	9.1
1955	8.3	8.1
1960	9.3	8.4
1965	9.7	8.2
1970	9.8	7.9
1975	9.1	7.0
1980	9.0	6.5
1985	9.0	6.1
1990	9.7	5.9
1995	10.3	5.9
1998	10.6	5.8

Figure 3
Mortality Rates by Race, Alabama, 1940-1998

Mortality Rates by Race, Alabama, 1940-1998

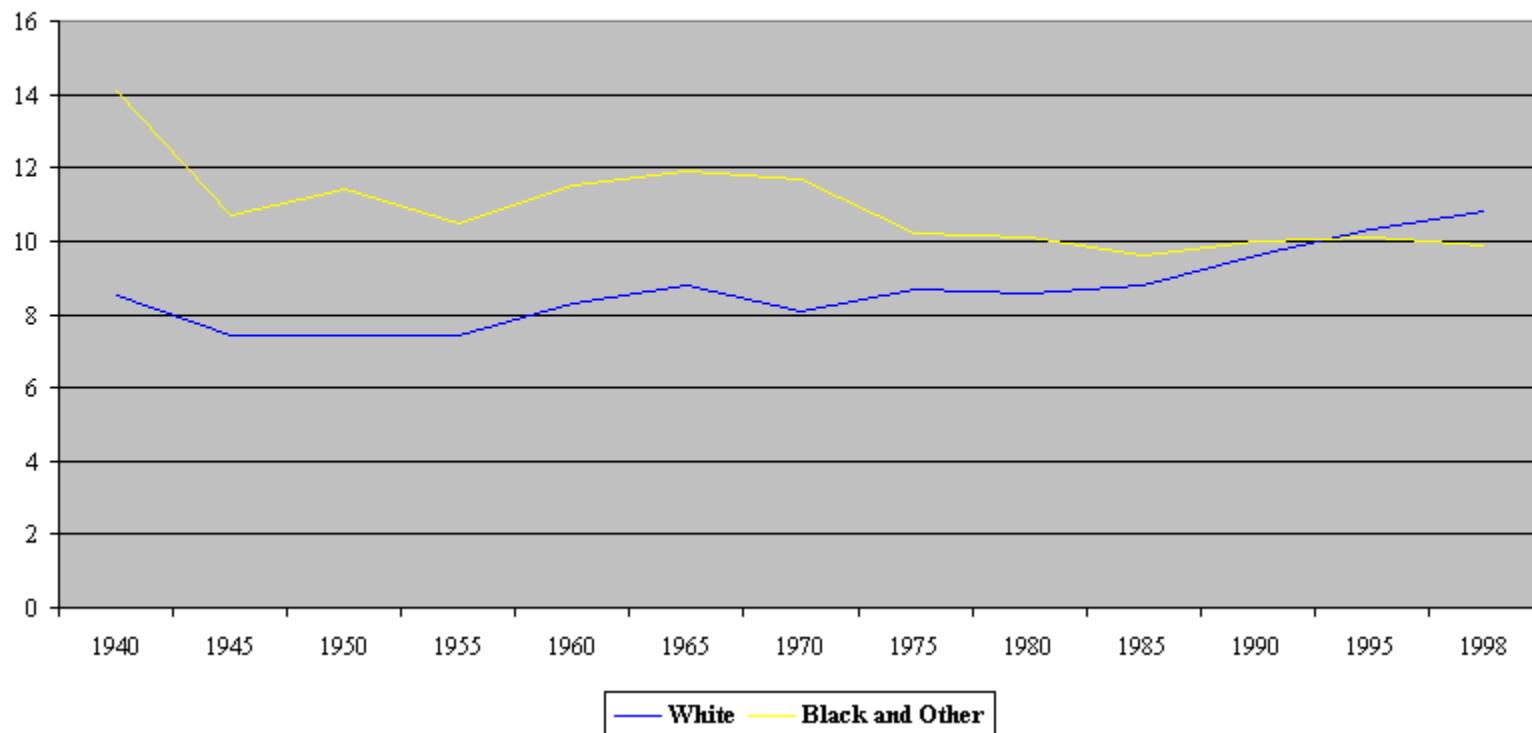


Figure 3

Mortality Rates by Race, Alabama, 1940-1998

	White	Black and Other
1940	8.5	14.1
1945	7.4	10.7
1950	7.4	11.4
1955	7.4	10.5
1960	8.3	11.5
1965	8.8	11.9
1970	8.1	11.7
1975	8.7	10.2
1980	8.6	10.1
1985	8.8	9.6
1990	9.6	10.0
1995	10.3	10.1
1998	10.8	9.9

Figure 4
Age-Specific Mortality Rates by Race, Alabama, 1998

Age-specific Mortality Rates by Race, Alabama, 1998

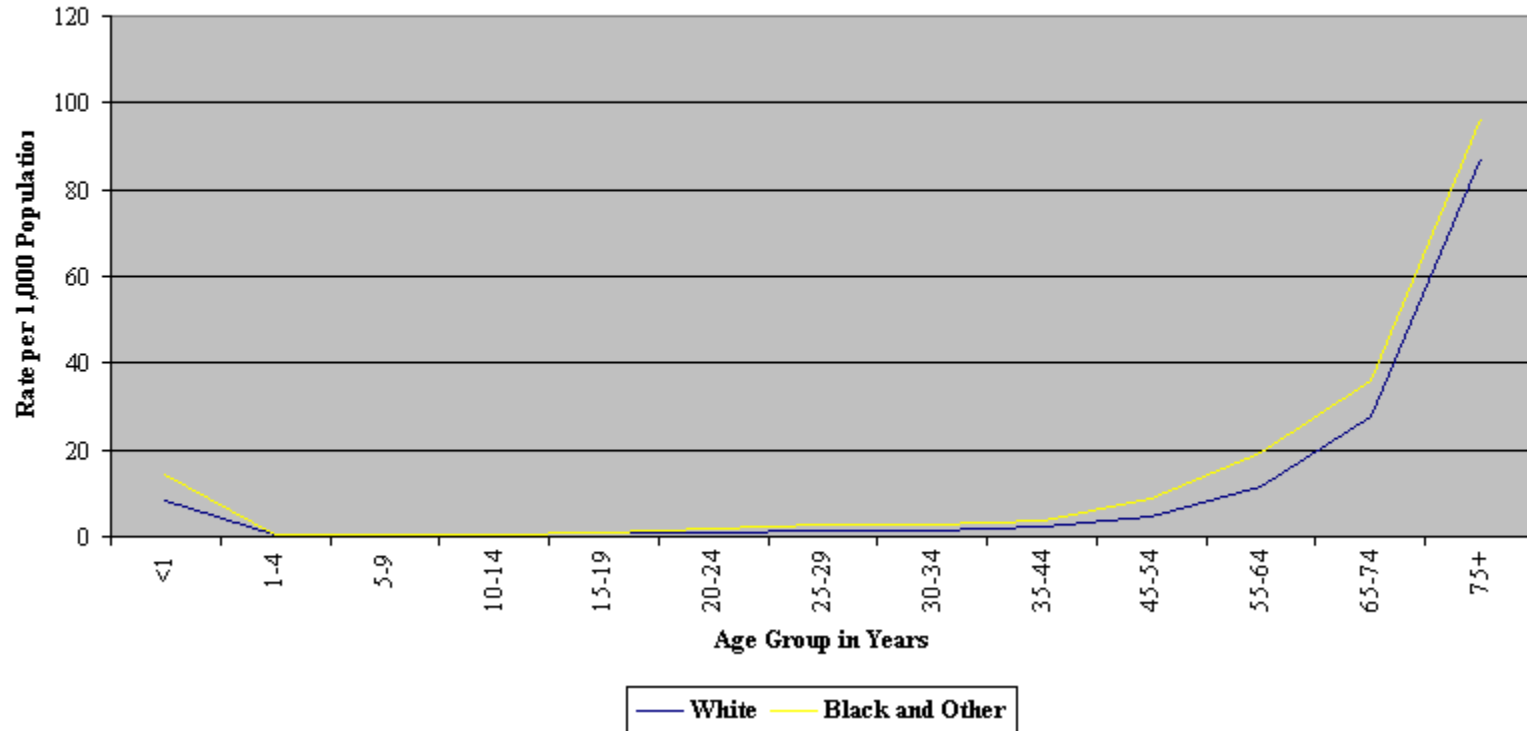


Figure 4

**Age-specific Mortality Rates by Race,
Alabama, 1998**

	White	Black and Other
<1	8.1	14.5
1-4	0.4	0.6
5-9	0.2	0.3
10-14	0.3	0.4
15-19	1.1	1.0
20-24	1.1	1.7
25-29	1.2	2.6
30-34	1.5	2.8
35-44	2.4	3.9
45-54	4.8	9.0
55-64	11.7	19.2
65-74	27.7	35.8
75+	87.1	96.4

Figure 5
Infant Mortality Rates by Race, Alabama, 1940-1998

Infant Mortality Rates By Race, Alabama, 1940-1998

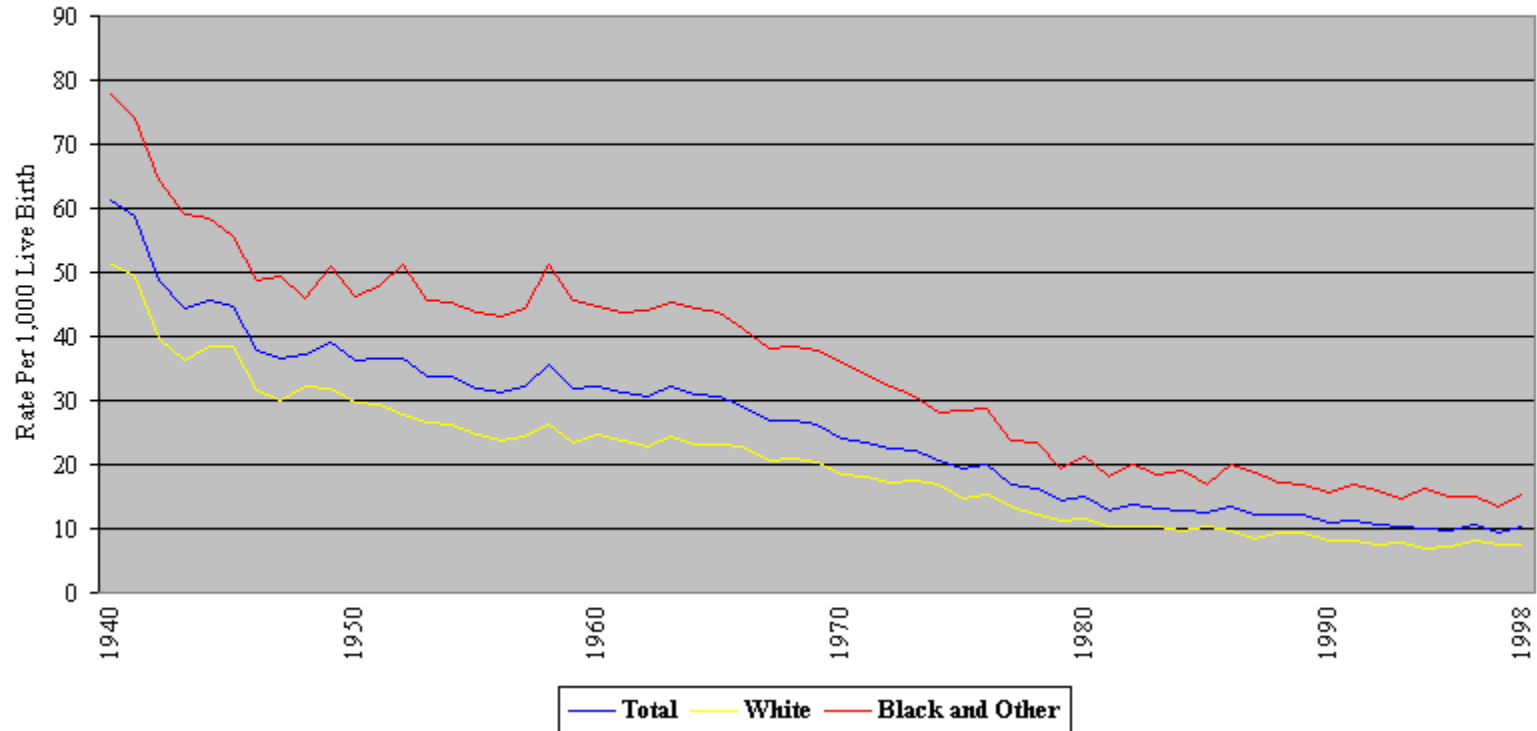


Figure 5

**Infant Mortality Rates by Race,
Alabama, 1940-1998**

	Total	White	Black and Other
1940	61.3	51.1	77.9
	58.7	49.3	74.1
	48.8	39.8	64.5
	44.4	36.3	59.0
	45.7	38.5	58.4
	44.8	38.4	55.5
	37.7	31.6	48.7
	36.7	30.1	49.4
	37.3	32.2	46.0
	39.2	32.0	50.8
1950	36.4	29.7	46.4
	36.6	29.5	47.7
	36.7	27.8	51.2
	33.9	26.5	45.7
	33.6	26.2	45.3

	32.0	24.6	43.7
	31.1	23.6	43.0
	32.1	24.5	44.5
	35.6	26.4	51.1
	31.9	23.5	45.6
1960	32.2	24.7	44.7
	31.2	23.6	43.8
	30.6	22.7	44.0
	32.3	24.5	45.4
	31.0	23.2	44.4
	30.7	23.1	43.8
	29.2	22.7	41.1
	26.8	20.5	38.2
	26.8	20.9	38.3
	26.1	20.4	37.9
1970	24.1	18.4	35.8
	23.5	18.0	34.1
	22.4	17.2	32.1
	22.1	17.5	30.7
	20.7	16.8	28.2

	19.5	14.7	28.3
	20.0	15.2	28.7
	17.0	13.4	23.8
	16.1	12.1	23.5
	14.3	11.3	19.5
1980	15.1	11.6	21.4
	12.9	10.2	18.0
	13.8	10.3	20.1
	13.1	10.3	18.3
	12.9	9.6	19.0
	12.6	10.4	16.8
	13.3	9.7	19.9

	12.2	8.5	18.7
	12.1	9.3	17.2
	12.1	9.4	17.0
1990	10.9	8.2	15.7
	11.2	8.1	16.9
	10.5	7.5	15.8
	10.3	7.9	14.8
	10.1	6.9	16.1
	9.8	7.1	15.0
	10.5	8.2	14.9
	9.5	7.5	13.5
1998	10.2	7.6	15.4

Figure 6
Infant Mortality Rates by Age and Race of Mother, Alabama, 1998

Infant Mortality Rates by Age and Race of Mother, Alabama, 1998

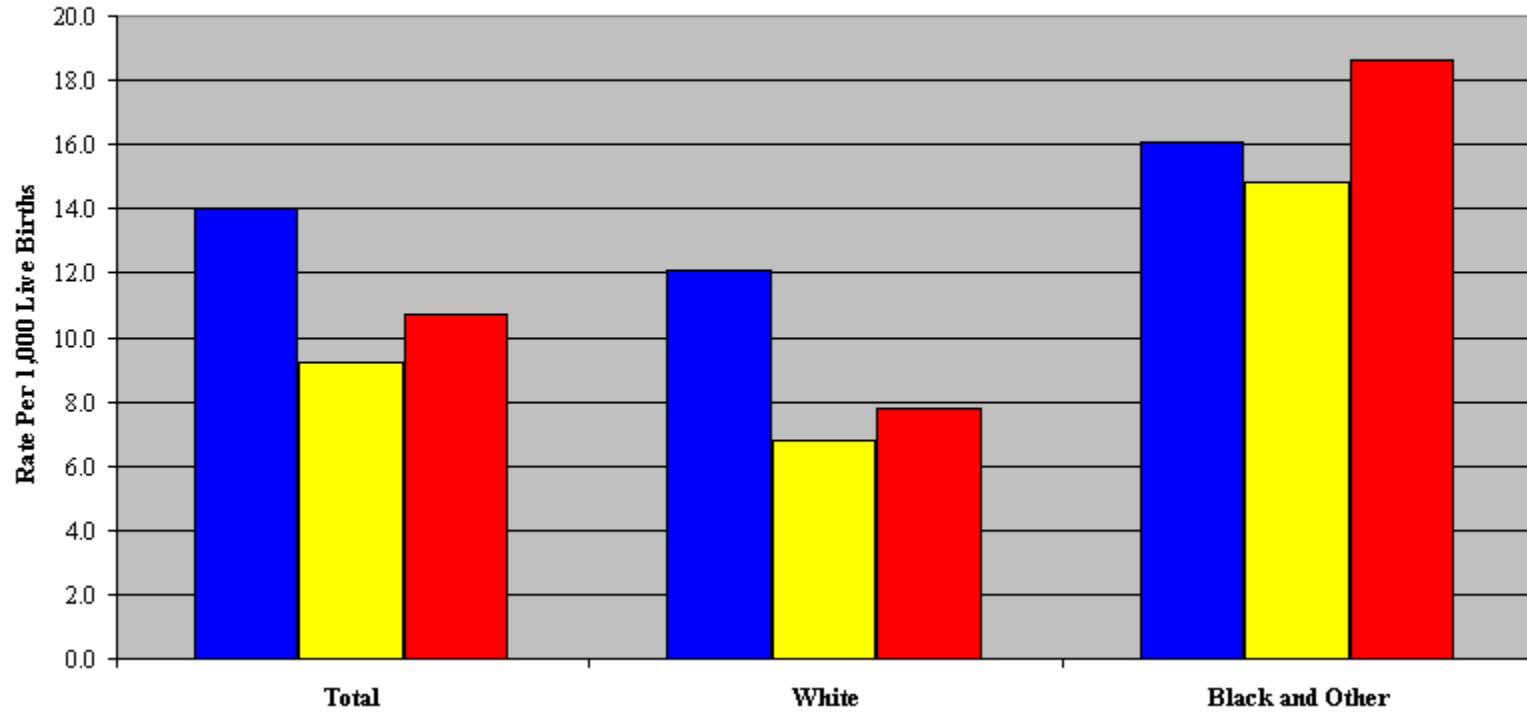


Figure 6

**Infant Mortality Rates by Age & Race of Mother,
Alabama, 1998**

	10-19	20-34	35 and Older
Total	14.0	9.2	10.7
White	12.1	6.8	7.8
Black and Other	16.1	14.8	18.6

Figure 7
Heart Disease Rates, Alabama and the U.S., 1980-1998

Heart Disease Rates, Alabama vs. US, 1998

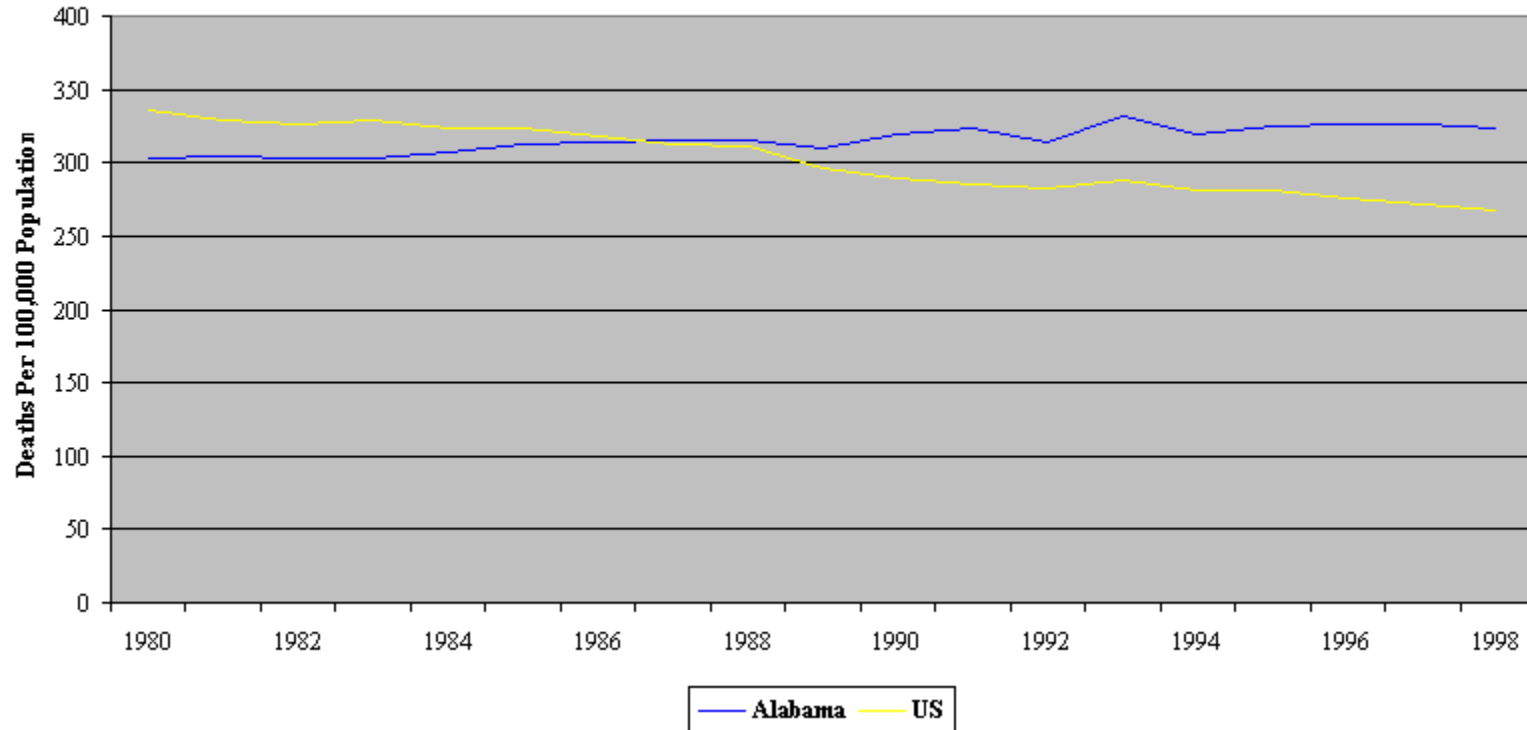


Figure 7

**Heart Disease Death Rates,
Alabama vs. US, 1998**

	Alabama	US
1980	302.6	336.0
	304.4	328.7
1982	302.7	326.0
	302.5	329.2
1984	307.2	323.5
	312.9	323.0
1986	314.2	317.5
	315.6	312.4

1988	314.9	311.3
	309.3	295.6
1990	319.1	289.5
	323.4	285.9
1992	314.6	282.5
	331.7	288.4
1994	319.7	281.3
	324.3	280.7
1996	326.2	276.4
	326.5	271.6
1998	323.7	268.0

Figure 8
Heart Disease Rates by Age, Race, and Sex, Alabama, 1998

Heart Disease Death Rates by Age, Race, and Sex Alabama, 1998

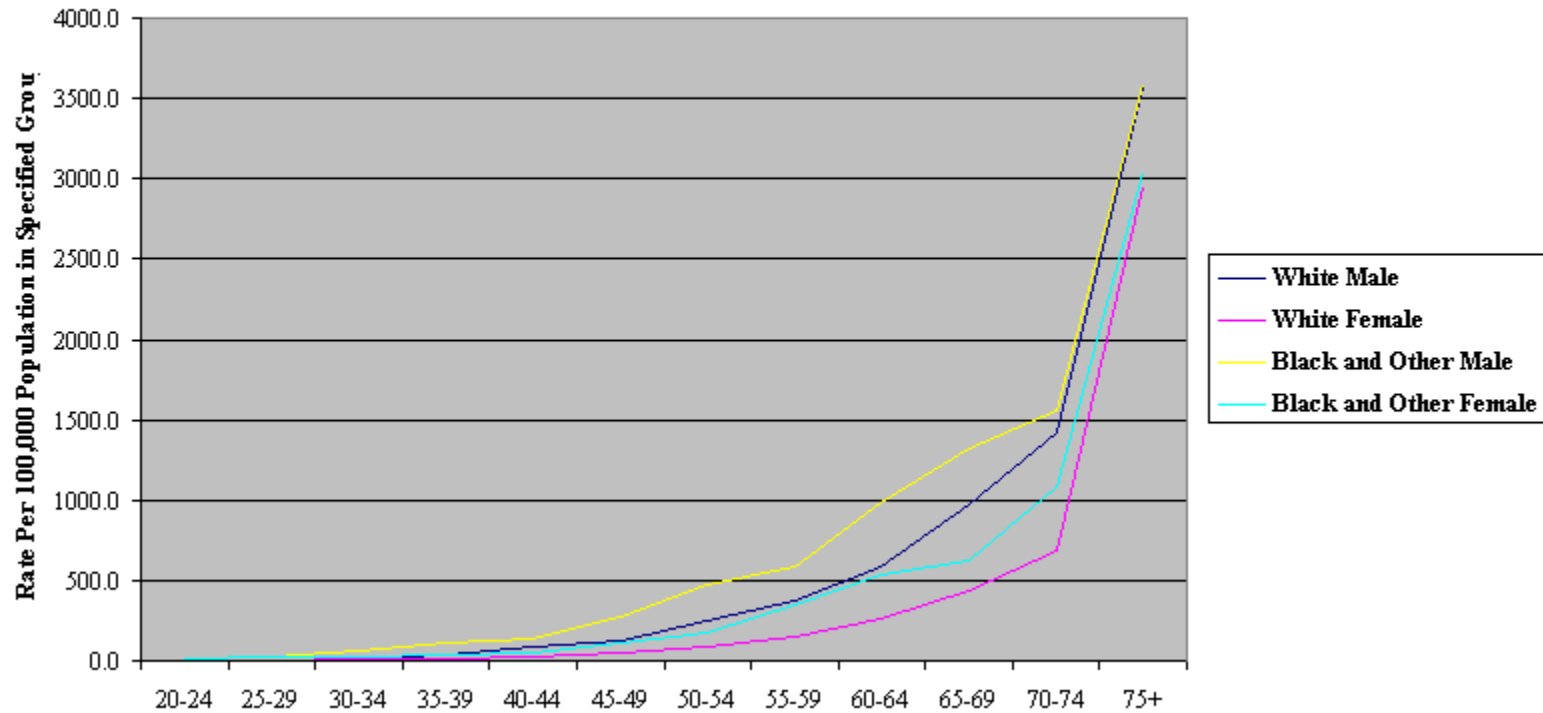


Figure 8

**Heart Disease Rates by Age, Race, and Sex,
Alabama, 1998**

	White Male	White Female	Black and Other Male	Black and Other Female
20-24	7.7	3.0	13.0	8.0
25-29	3.9	5.9	28.0	22.0
30-34	18.5	9.3	62.8	20.5
35-39	40.2	18.0	114.7	35.4
40-44	92.2	26.7	131.1	52.3
45-49	125.7	47.5	276.9	118.1
50-54	244.8	88.6	470.5	177.9
55-59	371.8	143.6	589.4	348.2
60-64	591.3	263.2	984.1	534.8
65-69	976.5	437.0	1325.2	619.9
70-74	1414.4	682.7	1558.2	1089.0
75+	3579.0	2954.6	3588.6	3045.5

Figure 9
Death Rates from Malignant Neoplasms
by Primary Site and Sex, Alabama, 1998

Malignant Neoplasms by Primary Site and Sex, Alabama, 1998

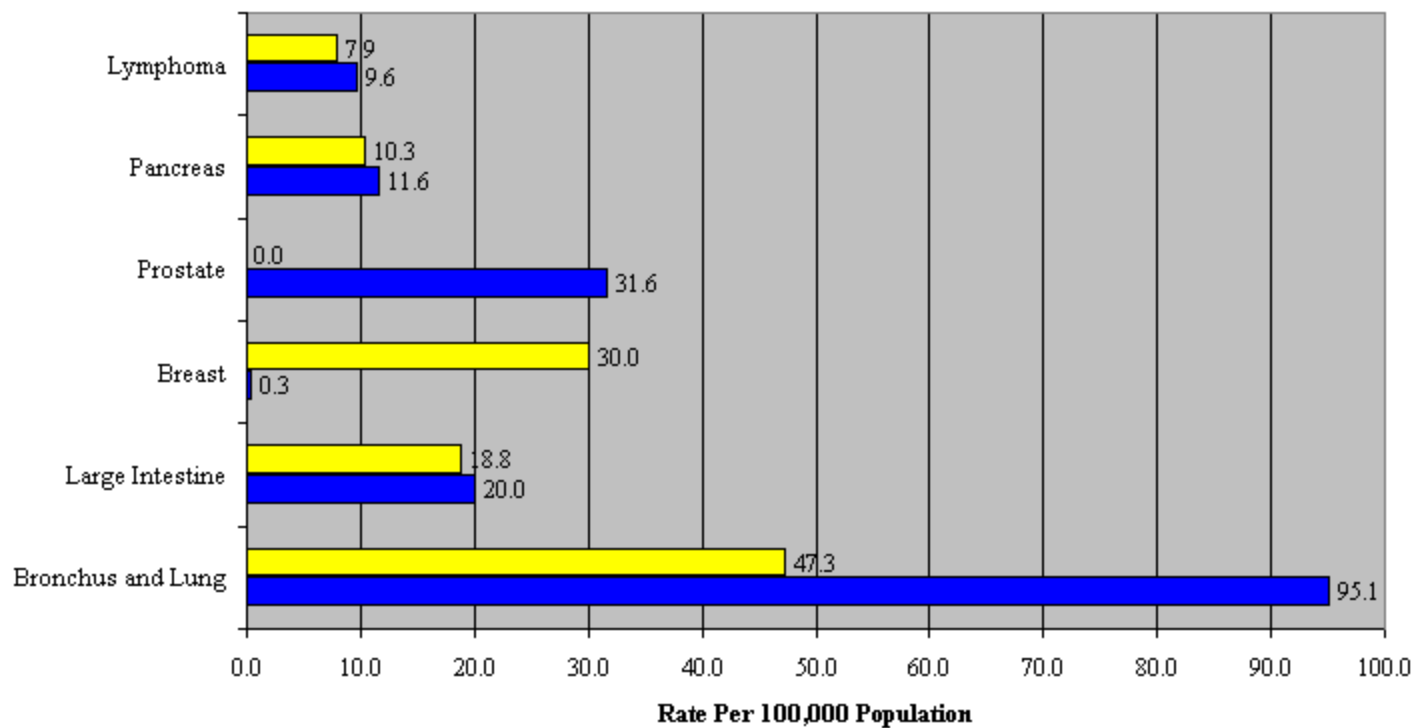


Figure 9

**Death Rates from Malignant neoplasms
by Primary Site and Sex,
Alabama, 1998**

	Male	Female
Bronchus and Lung	95.1	47.3
Large Intestine	20.0	18.8
Breast	0.3	30.0
Prostate	31.6	0.0
Pancreas	11.6	10.3
Lymphoma	9.6	7.9
Leukemia	9.6	8.3

Figure 10
Death Rates from Cerebrovascular Diseases
by Race, Alabama, and U.S. Rates, 1980-98

Cerebrovascular Diseases Death Rates by Race and US Rates, Alabama 1998

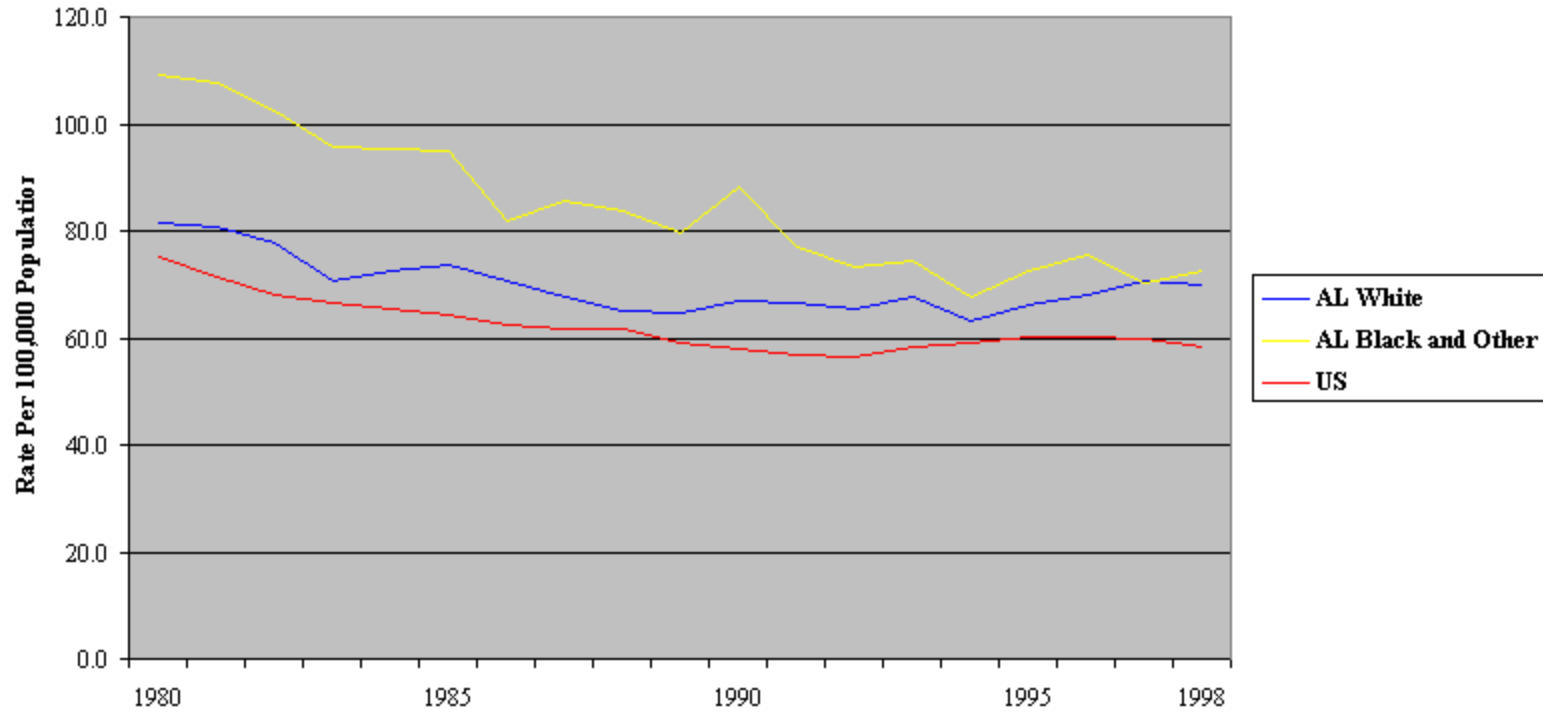


Figure 10
Cerebrovascular Diseases Death Rates
by Race and US Rates,
Alabama 1998

	AL White	AL Black and Other	US					
						65.1	83.9	61.6
						64.5	79.6	59.0
				1990		66.9	88.2	57.9
						66.7	77.0	56.9
						65.5	73.3	56.4
						67.6	74.4	58.2
						63.1	67.7	58.9
				1995		66.3	72.4	60.1
						68.0	75.6	60.3
						70.6	70.4	59.7
1980	81.6	109.2	75.1					
	80.6	107.8	71.3					
	77.7	102.6	68.1					
	70.5	95.7	66.6					
	72.6	95.2	65.4					
1985	73.7	95.1	64.3					
	70.8	81.7	62.3					
	67.6	85.5	61.8					
				1998		70.0	72.5	58.5

Figure 11
Death Rates from Homicide
by Race, Alabama, and U.S. Rates, 1980-1998

Homicide Death Rates By Race and Total US Rates, 1980-1998

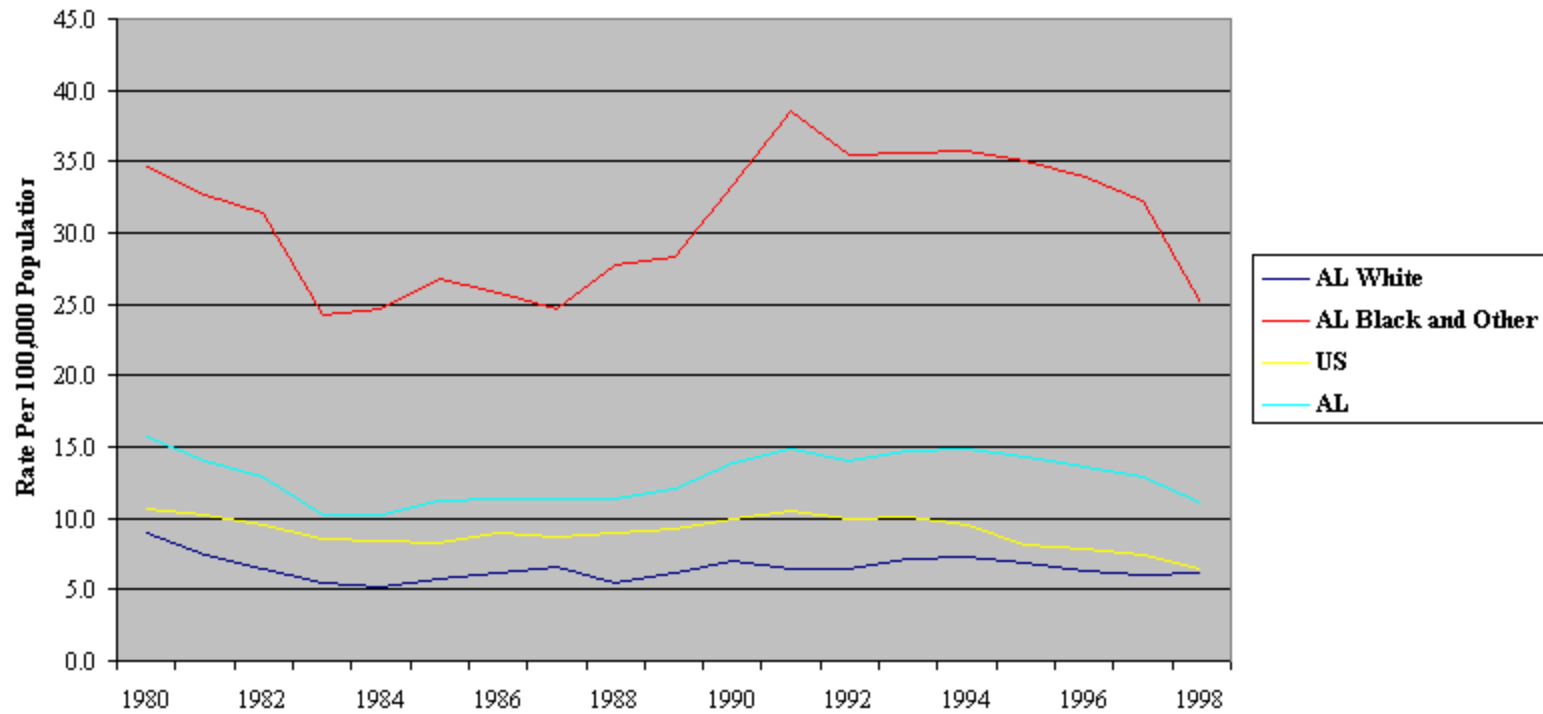


Figure 11

**Homicide Death Rates
by Race and Total US Rates,
1980-1998**

	AL White	AL Black and Other	US	AL
1980	9.0	34.6	10.7	15.7
	7.5	32.6	10.3	14.0
1982	6.4	31.4	9.6	12.9
	5.4	24.3	8.6	10.3
1984	5.2	24.7	8.4	10.3
	5.8	26.8	8.3	11.2
1986	6.2	25.8	9.0	11.3
	6.6	24.7	8.7	11.4
1988	5.4	27.7	9.0	11.3
	6.2	28.3	9.2	12.1
1990	7.0	33.3	10.0	13.9
	6.4	38.5	10.5	14.9
1992	6.4	35.4	10.0	14.0
	7.2	35.6	10.1	14.7

1994	7.3	35.8	9.6	14.8
	6.8	35.1	8.2	14.3
1996	6.3	33.9	7.9	13.6
	6.0	32.2	7.4	12.9
1998	6.1	25.1	6.4	11.1

Figure 12
Death Rates from Suicide
by Race, Alabama, and U.S. Rates, 1980-1998

Suicide Death Rates By Race and Total US Rates, 1980-1998

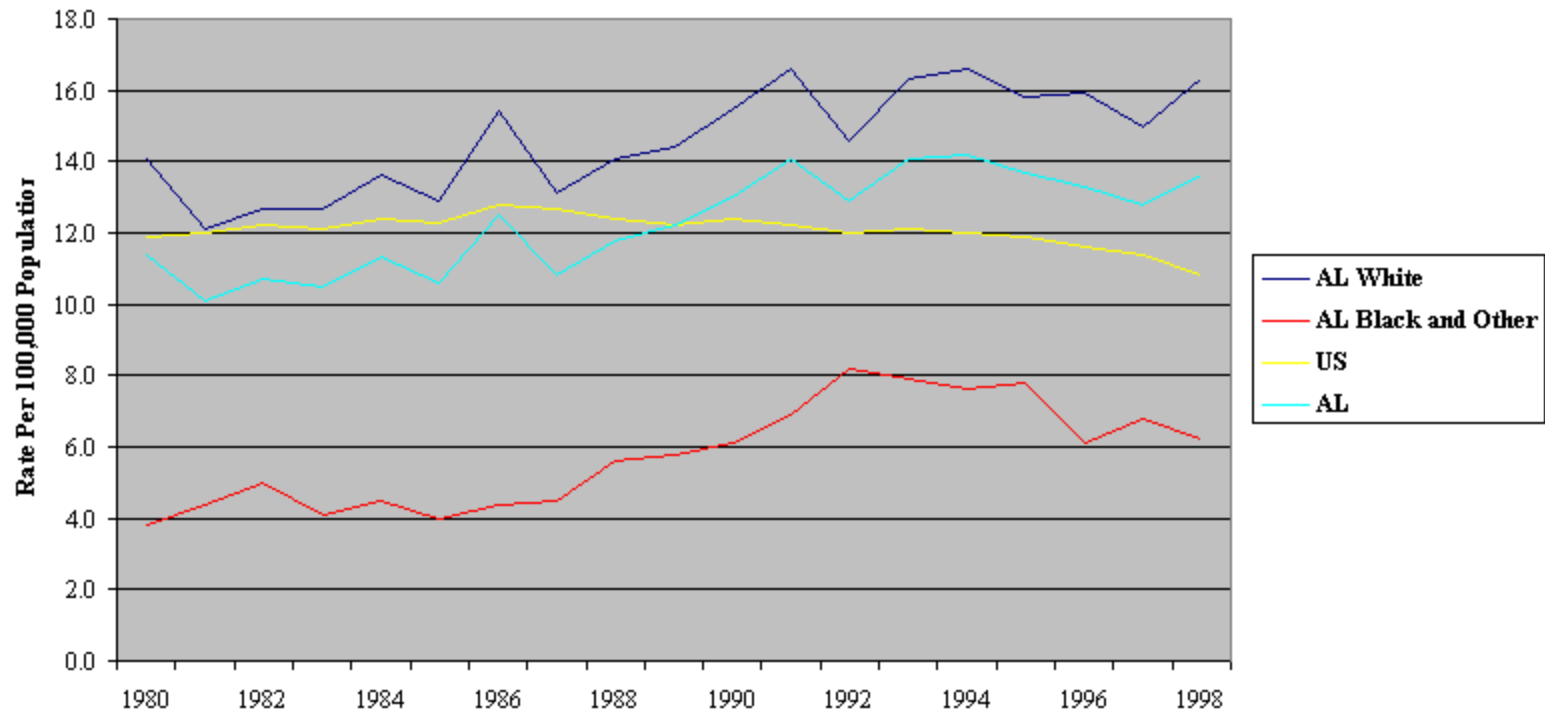


Figure 12

**Suicide Death Rates
by Race and Total US Rates,
1980-1998**

	AL White	AL Black and Other	US	AL
1980	14.1	3.8	11.9	11.4
	12.1	4.4	12.0	10.1
1982	12.7	5.0	12.2	10.7
	12.7	4.1	12.1	10.5
1984	13.6	4.5	12.4	11.3
	12.9	4.0	12.3	10.6
1986	15.4	4.4	12.8	12.5
	13.1	4.5	12.7	10.8
1988	14.1	5.6	12.4	11.8
	14.4	5.8	12.2	12.2
1990	15.5	6.1	12.4	13.0
	16.6	6.9	12.2	14.1
1992	14.6	8.2	12.0	12.9

	16.3	7.9	12.1	14.1
1994	16.6	7.6	12.0	14.2
	15.8	7.8	11.9	13.7
1996	15.9	6.1	11.6	13.3
	15.0	6.8	11.4	12.8
1998	16.3	6.2	10.8	13.6

Figure 13
Death Rates by County, Alabama, 1998

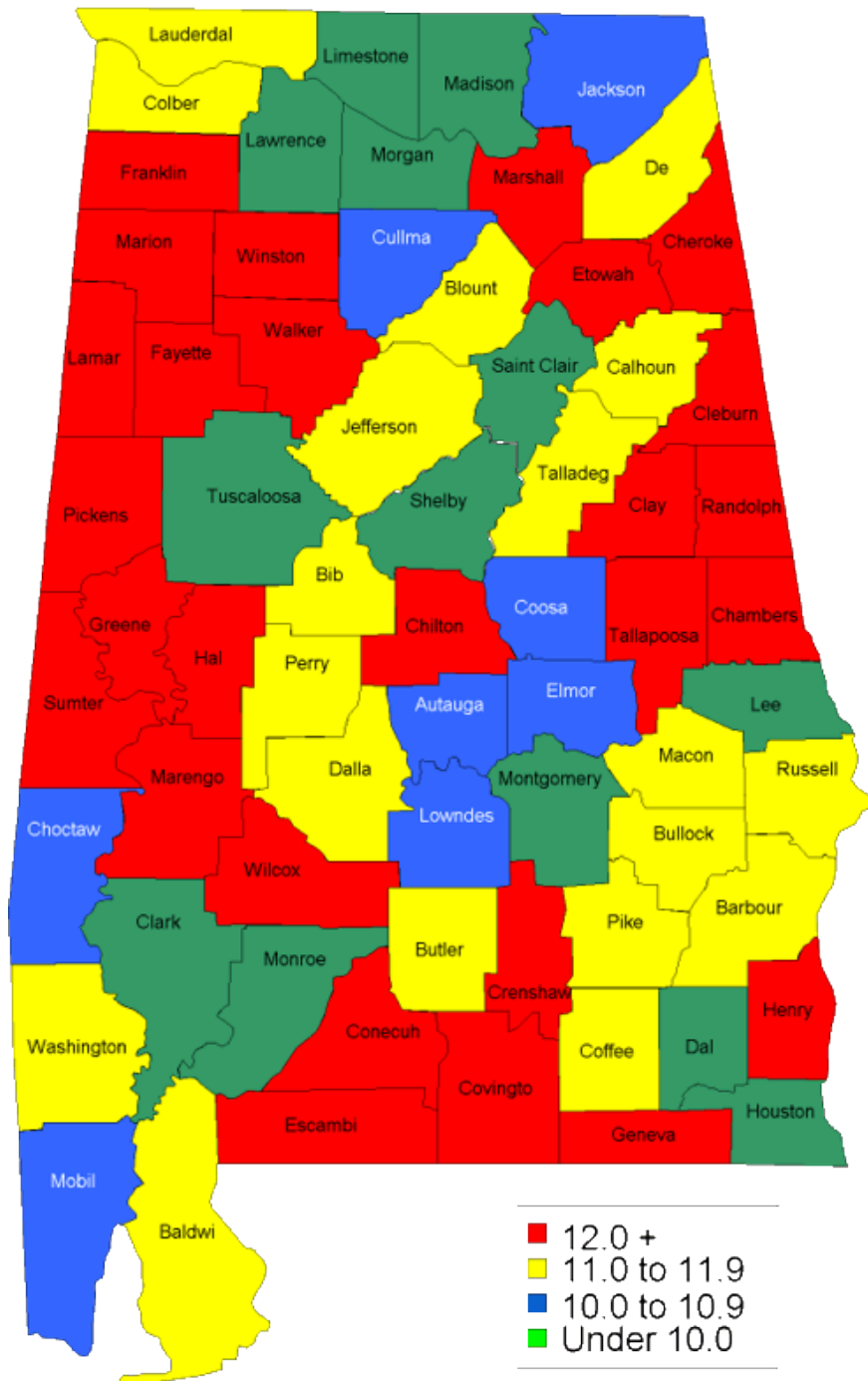


Table 1
Crude and Age Adjusted Death Rates,
Alabama, 1950-1998

Year	Crude Rate	Age-Adjusted Rate
1950	8.7	9.1
1955	8.3	8.1
1960	9.3	8.4
1965	9.7	8.2
1970	9.8	7.9
1975	9.1	7.0
1980	9.0	6.5
1985	9.0	6.1
1990	9.7	5.9
1995	10.3	5.9
1998	10.6	5.8

Table 2
Deaths and Death Rates for Males and Females
and Ratio of Rates, Alabama, 1950-1998

Age	<u>Deaths</u>		<u>Mortality Rates</u>		<u>Ratio</u>
	Males	Females	Males	Females	
Under 1	330	302	10.6	10.2	1.04
1-4	74	44	0.6	0.4	1.60
5-14	105	61	0.3	0.2	1.63
15-24	518	182	1.7	0.6	2.80
25-34	614	322	2.2	1.1	2.01
35-44	1,123	644	3.7	2.0	1.87
45-54	1,940	1,134	7.5	4.1	1.82
55-64	2,954	1,969	16.8	9.8	1.71
65-74	5,177	3,930	38.4	22.2	1.73
74-84	5,926	6,328	85.8	53.1	1.61
85+	3,259	6,969	185.3	148.0	1.25
Total	22,020	21,885	11.1	10.1	1.09

Table 3
Mortality Rates Per 1,000 Population by Race and Age,
Alabama, 1998

Age	All Races	White	Black & Other	Ratio Black & Other to White
Under 1	10.4	8.1	14.5	1.79
1-4	0.5	0.4	0.6	1.50
5-9	0.2	0.2	0.3	1.50
10-14	0.3	0.3	0.4	1.33
15-19	1.0	1.1	1.0	0.91
20-24	1.3	1.1	1.7	1.55
25-29	1.5	1.2	2.6	2.17
30-34	1.8	1.5	2.8	1.87
35-44	2.8	2.4	3.9	1.63
45-54	5.7	4.8	9.0	1.88
55-64	13.1	11.7	19.2	1.64
65-74	29.2	27.7	35.8	1.29
75+	88.9	87.1	96.4	1.11
All Ages	10.6	10.8	9.9	0.92

Table 4
Age-Adjusted Death Rates by Race,
Alabama, 1950-1998

Year	White	Black & Other	Ratio Black & Other to White
1950	7.7	12.5	1.62
1955	7.2	11.0	1.53
1960	7.2	11.4	1.58
1965	7.2	11.2	1.56
1970	7.1	10.4	1.46
1975	6.4	8.9	1.39
1980	5.9	8.5	1.44
1985	5.6	7.9	1.41
1990	5.3	7.8	1.47
1995	5.4	7.9	1.46
1996	5.4	7.8	1.44
1997	5.3	7.7	1.45
1998	5.3	7.6	1.43

Table 5
Leading Causes of Death, Alabama,
Then and Now

1895

1998

-
Tuberculosis

Diseases of the Heart

Pneumonia

Malignant Neoplasms (Cancer)

Heart Disease

Cerebrovascular Diseases (Stroke)

Malarial Diseases

Accidents

Dysentery

Chronic Obstructive Pulmonary

Diseases and Allied Conditions

Table A-1
Example of Age-Adjustment

Age Group	Deaths	Population	Mortality Rate	Standard Population	Deaths
Under 1 Year	632	60,908	0.0103763	15,343	159.20365
1-4 years	118	243,630	0.0004843	64,718	31.34558
5-14 years	166	585,499	0.0002835	170,355	48.29885
15-24 years	700	598,676	0.0011692	181,677	212.42525
25-34 years	936	563,490	0.0016611	162,066	269.20402
35-44 years	1,767	626,581	0.0028201	139,237	392.65758
45-54 years	3,074	535,961	0.0057355	117,811	675.70404
55-64 years	4,923	375,765	0.0131013	80,294	1,051.95360
65-74 years	9,107	311,692	0.0292181	48,426	1,414.91730
75-84 years	12,254	188,196	0.0651130	17,303	1,126.64970
85+	10,228	64,684	0.1581226	2,770	437.99951
Total	43,905	4,155,080	0.0105666	1,000,000	5,820.3591

Age-adjusted death rate = $5820.3591/1,000,000 \times 1000 = 5.8$ deaths per 1,000 population

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