2B. LEADING CAUSES OF DEATH

In 2010, the Office of Vital Records (OVR) of the Arizona Department of Health Services implemented the new (version 2003) Standard U.S. death certificate. The new certificate added several new questions: 1) whether tobacco use contributed to the death, and 2) whether, if the decedent was a female, the death was "pregnancy-associated" (defined as death from any cause during pregnancy or within one calendar year of delivery or pregnancy termination).

The death certificate now includes a new classification of the decedent’s racial/ethnic status, consistent with the revised federal standards for collecting and reporting racial and ethnic status. These standards were published in the Federal Register on October 30, 1997, as "Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity." The revised standards are available on the OMB (the Office of Management and Budget) web-site at: https://www.whitehouse.gov/omb.

There are now 15 racial categories (including Guamanian or Chamorro; Samoan or Native Hawaiian) to choose from. It is also permitted to indicate more than one race for a decedent. To create frequency counts of race and ethnicity that were adequate to compute statistically reliable mortality rates, race was "bridged", or essentially collapsed into 5 categories; White non-Hispanic, Hispanic or Latino, Black or African American, Native American or Alaska Native, and Asian or Pacific Islander. When an individual was identified as both Hispanic and any other race, that person was added to the racial/ethnic group with the lowest population. For example, a person identified as both White and Hispanic would be coded as Hispanic, where a person identified as American Indian and Hispanic would be coded as American Indian. Please refer to the technical appendix for further explanation of the racial bridging used in this report.
2B. LEADING CAUSES OF DEATH

Based on the number of deaths (but not age-adjusted mortality rate), the leading underlying cause of death to Arizona residents in 2018 was heart disease (12,410 or 21.0 percent of all deaths), closely followed by cancer, which accounted for 12,097 or 20.4 percent of deaths (Figure 2B-1A, Table 2B-1, Table 5E-14). The third leading cause of death, accidents (unintentional injuries), accounted for 4,211 or 7.1 percent of total deaths. Deaths due to chronic lower respiratory diseases ranked fourth in 2018, with 3,820 resident deaths reported. Deaths due to Alzheimer’s disease ranked fifth in 2018, with 3,011 resident deaths reported. Together, these five causes accounted for 60.0 percent of total deaths in 2018. The fifteen leading causes accounted for 79.9 percent of all deaths among Arizona residents.

For the purpose of mortality statistics, every death is attributed to one underlying condition or underlying cause of death. The underlying cause is defined as the disease or injury that initiated the chain of events leading directly to death. It is selected from up to 20 causes and conditions entered by the physician on the death certificate. The totality of all these conditions is known as multiple cause of death.

In addition to 12,410 deaths that had diseases of the heart assigned as the underlying cause, another 11,863 deaths had diseases of the heart assigned as a secondary cause of death. The sum of these two counts (24,273, Figure 2B-1B) is the total number of deaths that had any mention of diseases of the heart on the 2018 death certificates. The ranking based on any mention of the 15 diagnostic categories is different from ranking of the leading causes of death based on the underlying cause. In particular, Essential hypertension ranked 11th as the underlying cause but ranked 3rd when any mention of it was counted.

Figure 2B-1A
Leading Causes of Death among Arizona Residents in 2018
BASED ON THE NUMBER OF DEATHS DUE TO THE UNDERLYING CAUSE:

- 1. Diseases of the heart: 12,410
- 2. Malignant neoplasms: 12,097
- 3. Chronic lower respiratory diseases: 4,211
- 4. Essential (primary) hypertension: 12,097
- 5. Alzheimer’s disease: 3,820
- 6. Diabetes: 3,011
- 7. Septicemia: 2,820
- 8. Suicides: 2,041
- 9. Chronic liver disease and cirrhosis: 1,432
- 10. Influenza and pneumonia: 1,432
- 11. Essential (primary) hypertension and hypertensive renal disease: 1,319
- 12. Parkinson’s disease: 900
- 13. Nephritis, nephrotic syndrome and nephrosis: 830
- 14. Assault (homicide): 800
- 15. Septicemia: 782

Figure 2B-1B
Leading Causes of Death among Arizona Residents in 2018
BASED ON THE NUMBER OF DEATHS DUE TO ANY MENTION OF A CAUSE:

- 1. Diseases of the heart: 24,273
- 2. Malignant neoplasms: 12,097
- 3. Chronic lower respiratory diseases: 4,211
- 4. Essential (primary) hypertension: 8,294
- 5. Diabetes: 5,461
- 6. Accidents (unintentional injuries): 4,907
- 7. Cerebrovascular diseases: 4,391
- 8. Alzheimer’s disease: 3,506
- 9. Influenza and pneumonia: 3,304
- 10. Nephritis, nephrotic syndrome and nephrosis: 2,277
- 11. Septicemia: 2,041
- 12. Chronic liver disease and cirrhosis: 1,955
- 13. Suicide: 1,432
- 14. Parkinson’s disease: 1,202
- 15. Assault (homicide): 419
It is important to note that (Figures 2B-2, 2B-3, 2B-4, and 2B-5) are based on the age-adjusted mortality rates and not on the number of deaths.

In 2018, diseases of the heart were the leading cause of death for White non-Hispanics and Blacks while it was the second leading cause of death for the remaining race/ethnic groups. Cancer was the second leading cause of death for White non-Hispanics, and Black or African Americans, but ranked first for Hispanics and Asians. Unintentional injury was among the third leading cause of death for White non-Hispanics, Hispanics, and Blacks, while it ranked first among American Indians and fourth among Asians. (Figure 2B-2, Table 2B-4).

In 2018, chronic lower respiratory diseases were the fourth leading cause of death specific to White non-Hispanics. In parallel, chronic liver disease and cirrhosis ranked fourth among the leading causes of death for American Indians alone. Alzheimer’s disease was the fifth leading cause of death for all subgroups, except among Hispanics (cerebrovascular diseases) and American Indians (diabetes). (Table 2B-4).

Based on age-adjusted mortality rates, cancer was the leading cause of death among White non-Hispanic, Hispanic, and Asian females. Diseases of the heart were the leading cause of death specific to Black and American Indian females (Figure 2B-3, Table 2B-4).

Chronic lower respiratory diseases were the third leading cause of death specific to White non-Hispanic females. Chronic liver disease and cirrhosis was unique to American Indian women and ranked third among the leading causes of death. Diabetes ranked fourth among Blacks females but fifth among Hispanic and American Indian females.
2B. LEADING CAUSES OF DEATH

Five Leading Causes by Gender

Based on age-adjusted mortality rates, diseases of the heart followed by cancer were the two leading causes of death among males for all race/ethnic groups except Black and American Indian males (Figure 2B-4; Table 2B-4). Unintentional injury ranked third position for all race/ethnic groups, except among American Indians.

In 2018, based on the age-adjusted mortality rates, diabetes was among the fourth leading causes of death for Hispanic, Black, and Asian males, while chronic lower respiratory diseases, and chronic liver disease ranked fourth for White non-Hispanic males and American Indian males, respectively.

Ranking fifth was suicide (White males) cerebrovascular diseases (Hispanic, Black and Asian males) and diabetes (American Indian males).

In 2018, the profile of the leading causes of death differed by gender for residents of the urban (Maricopa, Pima, Pinal, and Yuma counties) and rural (all the remaining counties) areas of the state (Figure 2B-5, Table 2B-5). Diseases of the heart exceeded cancer as the leading causes of death among urban males and rural males and females. Unintentional injury placed third among the leading cause for males but fifth for females, regardless of area of residence.

Alzheimer’s disease was the third leading cause of death among urban females but the fourth among rural females. Chronic lower respiratory diseases were the fourth leading cause of death in urban areas and among rural males, while it was the third among rural females. Among the fifth leading cause of death, cerebrovascular diseases were specific to urban males while suicide was specific to rural males.
The age-adjusted mortality rate for diseases of the heart decreased by 35.8 percent from 219.0 deaths per 100,000 population in 1998 to 140.5/100,000 in 2018 (Figure 2B-6). The age-adjusted mortality rate for cancer declined less, by 22.1 percent, from 1998-2018. In Arizona, the relative risk of death from heart disease versus cancer changed from 25.5 percent greater in 1998 to 3.4 percent less in 2018.

In 2008, 350 more Arizonans died from diseases of the heart than cancer (Table 2B-1). In 2018, the number of deaths due to diseases of the heart exceeded by 313 cases (Table 2B-4).

For the past several years, cancer has been the number one cause of death among Arizonans aged 0-84 years (Figure 2B-7). Beginning in 1996, the annual number of cancer deaths exceeded the number of deaths from heart disease. In 2018, 2,382 more Arizonans 0-84 years old died from cancer (10,014) than heart disease (7,632).
### 2B. LEADING CAUSES OF DEATH

**Diseases of heart and malignant neoplasm (cancer)**

**Figure 2B-8**

Deaths from Heart Disease and Cancer among Arizonans 85+, 2008-2018

Among Arizonans age 85 and over, heart disease is the number one leading cause of death by a wide margin. In 2018, adults aged 85 and over accounted for 17.2 percent of all deaths from cancer but 38.5 percent of all deaths from heart disease. In 2018, the median age at death for heart disease was 80 years (Table 2D-3); and a minority of deaths (44.8 percent, Table 2D-4) were premature, i.e., before reaching the expected years of life at birth for all U.S. residents (78.8 years).

However, from 2008 to 2018, the number of deaths from cancer increased by 37.3 percent among Arizonans 85 years or older, more than the increase observed in diseases of the heart (28.4 percent increase).

**Figure 2B-9**

Age-adjusted Mortality Rates* for Heart Disease and Cancer by Race/Ethnicity, Arizona, 2018

In Arizona, Black or African Americans were 1.9 times more likely to die from diseases of the heart and 1.5 times more likely to die from malignant neoplasms in 2018 than Asians, the group with the lowest risk of each respective cause of death (Figure 2B-9, Table 2B-4). Compared to Asians, White non-Hispanic Arizonans were 1.7 times more likely to die of heart disease and 1.4 times more likely to die of cancer.

In 2018, the relative risk of death from heart disease exceeded cancer mortality risk (Table 2B-3) for all the racial/ethnic groups, except for Hispanics and Asians.

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*Note: * Number of deaths per 100,000 population age-adjusted to the 2000 U.S. standard.
2B. LEADING CAUSES OF DEATH
Accidents (unintentional injury)

The number of deaths from unintentional injuries increased by 3.1 percent from 4,085 in 2017 to 4,211 in 2018 (Table 2B-1). In 2018, based on age-adjusted mortality rates, accidents ranked third as a leading cause of death for males and fifth for females (Table 2B-4). From 2017 to 2018, the age-adjusted mortality rate for accidents increased 3.7 percent for males while it decreased 3.8 percent for females (Figure 2B-10).

In 2018, 1,032 deaths were caused by motor vehicle accidents, an increase of 5.4 percent from 2017. Heat induced mortality has seen a reduction of 13.0 percent between 2017 and 2018. Deaths due to accidental drowning and submersion decreased by 13.2 percent from 2017 (n=106) to 2018 (n=92). Additionally, Arizonans experienced a 12.3 percent increase in the number of accidental poisonings due to drugs and/or medicaments from 1,269 deaths in 2017 to 1,425 fatalities in 2018; Table 2B-9).

The American Indian death rate for unintentional injuries (144.5/100,000) was 5.8 times greater than the rate for Asians 24.9/100,000), the group with the lowest risk of unintentional injury death among racial/ethnic groups in the state (Figure 2B-11, Table 2B-4).

In 2018, Apache (134.1/100,000) and La Paz (123.6/100,000) counties had the two highest age-adjusted mortality rates for unintentional injuries (Table 5E-11).
In 2018, chronic lower respiratory diseases (bronchitis, emphysema, asthma) were the 4th leading cause of death among Arizona residents (Table 2B-1). From 2017 to 2018, the mortality rate for chronic lower respiratory diseases decreased for both genders, but more so among males (1.3 percent) than females (0.7 percent; Figure 2B-12, Table 2B-2).

Urban females had the lowest mortality rate for chronic lower respiratory diseases (38.0/100,000) among the genders and by regional group (Table 2B-5). Rural males were the group with the highest mortality risk for chronic lower respiratory diseases (57.4/100,000), followed by rural females (52.7/100,000) and urban males (41.4 deaths per 100,000).

Mortality rates for emphysema, chronic bronchitis, asthma, and other lower respiratory disorders were substantially higher among White non-Hispanics (48.0 deaths per 100,000) than any other race/ethnic groups. Asians recorded the lowest rate at 17.2 deaths per 100,000 population (Figure 2B-13, Table 2B-4).

Notes: * Number of deaths per 100,000 population age-adjusted to the 2000 U.S. standard; † This ICD-10 title corresponds to Chronic Obstructive Pulmonary Disease (ICD-9 title).
Cerebrovascular disease and diseases of the heart are two of the leading causes of death that share many risk factors such as hypertension, smoking, obesity, and high levels of cholesterol. The age-adjusted mortality rate for cerebrovascular diseases increased by 4.6 percent from 30.7 deaths per 100,000 population in 2017 to 32.1/100,000 in 2018 (Table 2B-3).

With some exceptions, the risk of dying from cerebrovascular diseases was generally higher among females than males for the period 2008-2018. In 2012, the age-adjusted mortality rate for stroke was greater among males than females, with male risk being slightly higher than female risk (Figure 2B-14). In 2018 as in 2015 and 2017, males experienced a higher risk of dying from cerebrovascular diseases than females. (Figure 2B-14, Table 2B-2).

Compared to Arizona’s overall rate, Black or African Americans were 1.4 times more likely to die from cerebrovascular disease in 2018 (Figure 2B-15, Table 2B-4). The 2018 mortality rate for cerebrovascular disease among Asians (27.9/100,000) was the lowest among racial/ethnic groups.
2B. LEADING CAUSES OF DEATH

Alzheimer’s disease

Based on the number of deaths in 2018, Alzheimer’s disease was the 3rd leading cause of death for females and 8th leading cause for males (Table 2B-4).

From 2017 to 2018, the age-adjusted mortality rate for Alzheimer’s disease decreased by 8.6 percent for males while it increased by 0.5 percent for females (Figure 2B-16).

The age-adjusted mortality rates for Alzheimer’s disease in 2018 were higher among Black or African Americans (45.1/100,000), White non-Hispanics (35.1/100,000) than the other racial/ethnic groups. Rates lower than the state average were recorded among Asians (19.8/100,000), American Indians (21.0/100,000), and Hispanics (30.5/100,000; Figure 2B-17, Table 2B-4).

White non-Hispanic residents of Arizona disproportionately contributed to mortality from Alzheimer’s disease. In 2018, White non-Hispanics accounted for 55.8 percent (Table 10C-1) of the state’s population, but 84.6 percent of all deaths from Alzheimer’s disease (2,548 out of 3,011; Table 2B-4).

In 2018, the overall median age at death from Alzheimer’s disease was 87, specifically 85 years for males and 88 years for females (Table 2D-3).
2B. LEADING CAUSES OF DEATH

Diabetes

From 2008-2018, mortality rates for diabetes decreased among males (44.0 percent) while it declined among females (23.0 percent; Figure 2B-18).

In addition to 2,041 deaths that had diabetes assigned as the underlying cause in 2018, another 3,420 deaths had diabetes assigned as a contributing factor. The diabetes-related death rate of 61.7/100,000 (Table 6A-6) was 2.7 times greater than the rate for diabetes as an underlying cause (23.0/100,000; Table 2B-2).

The diabetes-related death rate includes all mentions of diabetes on the death certificate as the underlying or other than underlying cause.

In 2018, compared to Arizona’s rate, American Indians were 3.2 times more likely to die from diabetes (73.6 deaths per 100,000; Figure 2B-19, Table 2B-4). The rate of 17.0 deaths per 100,000 among Asians was the lowest rate among all racial/ethnic groups in the state.

Among the 15 Arizona counties, Graham (55.0/100,000) and Navajo (45.3/100,000) counties had the highest mortality rates for diabetes recorded in 2018 (Table 5E-11).
2B. LEADING CAUSES OF DEATH
Influenza and pneumonia

The number of deaths from influenza and pneumonia increased by 3.5 percent from 1,075 in 2008 to 1,113 in 2018. (Table 2B-1). Among the 1,113 deaths, influenza was identified as the underlying cause for 213 of them, while pneumonia was listed as the underlying cause on 900 death certificates (Table 2B-6).

The mortality rate for influenza and pneumonia increased for females from 8.9 deaths in 2017 to 10.8 deaths per 100,000 in 2018 (Figure 2B-20, Table 2B-2). The mortality rate for influenza and pneumonia also increased for males from 11.1/100,000 in 2017 to 15.0 deaths per 100,000 in 2018.

In 2018, the age-adjusted mortality rate for Arizona males was 38.9 percent greater than that of Arizona females.

In 2018, American Indian residents of Arizona had the highest mortality rate for influenza and pneumonia (30.1 deaths per 100,000) among the racial/ethnic groups. The age-adjusted mortality of 11.7/100,000 among Blacks was the lowest rate in the state (Figure 2B-21, Table 2B-4).

County comparisons show that in 2018 influenza and pneumonia mortality rates were lower in Coconino, Pinal, Santa Cruz, Cochise and Maricopa Counties than in the remaining counties (Table 5E-11).
In 2018, based on age-adjusted mortality rates, suicide was the 6th leading cause of death among males. It ranked as the 11th cause of mortality for females. The overall age-adjusted suicide rate increased from 18.0 suicides per 100,000 in 2017 to 19.5 in 2018 (Table 2B-4).

From 2017 to 2018, suicide mortality increased by 12.1 percent among males, while it decreased 7.1 percent among females (Figure 2B-22, Table 2B-4). In 2018, suicide posed a 4 times greater mortality risk for males (31.5/100,000) than for females (7.8/100,000).

In 2018, American Indians had the highest age-adjusted suicide rate (36.5 suicides per 100,000) among racial/ethnic groups, followed by White non-Hispanics (23.7/100,000), while Asians recorded the lowest age-adjusted suicide rate (7.3/100,000; Figure 2B-23, Table 2B-4).

The 2018 age-adjusted mortality rates for suicide varied across the state, from a low rate of 9.7 suicides per 100,000 residents in Graham County to a high of 50.0 suicides per 100,000 residents in La Paz County (Table 5E-11).
2B. LEADING CAUSES OF DEATH

Chronic liver disease and cirrhosis

Figure 2B-24
Age-adjusted Mortality Rates* for Chronic Liver Disease and Cirrhosis by Gender and Year, Arizona, 2008-2018

Chronic liver disease and cirrhosis was the 9th leading cause of death in Arizona in 2018 (Figure 2B-1, Table 2B-1). Among the 1,159 deaths due to chronic liver disease and cirrhosis, 712 (61.4 percent) were males (Table 2B-4).

Among females, the age-adjusted mortality rate for chronic liver disease and cirrhosis increased 1.9 percent from 2017 to 2018. Among males, the mortality rate decreased 0.6 percent from 18.0/100,000 in 2017 to 17.9/100,000 in 2018 (Figure 2B-24, Table 2B-3).

In 2018, La Paz, Navajo, Apache, and Gila counties had the highest mortality rates for chronic liver disease and cirrhosis (Table 5E-11).

In 2018, chronic liver disease and cirrhosis mortality rate was exceedingly high among American Indians (88.8 deaths per 100,000 population) than any racial/ethnic groups in the state (Figure 2B-25, Table 2B-4). Death rate for chronic liver disease and cirrhosis among Asians, Blacks and White non-Hispanics were all below the state average (14.2 deaths per 100,000 population).

Compared to the median age at death from all causes (76 years), those who died from chronic liver disease and cirrhosis were on average 16 years younger (60 years, Table 2D-3). In 2018, the median age at death of American Indians who died from chronic liver disease and cirrhosis was 49.5 years, which was 10.5 years younger than all the other race/ethnic groups (Table 2D-3).