## 2B.

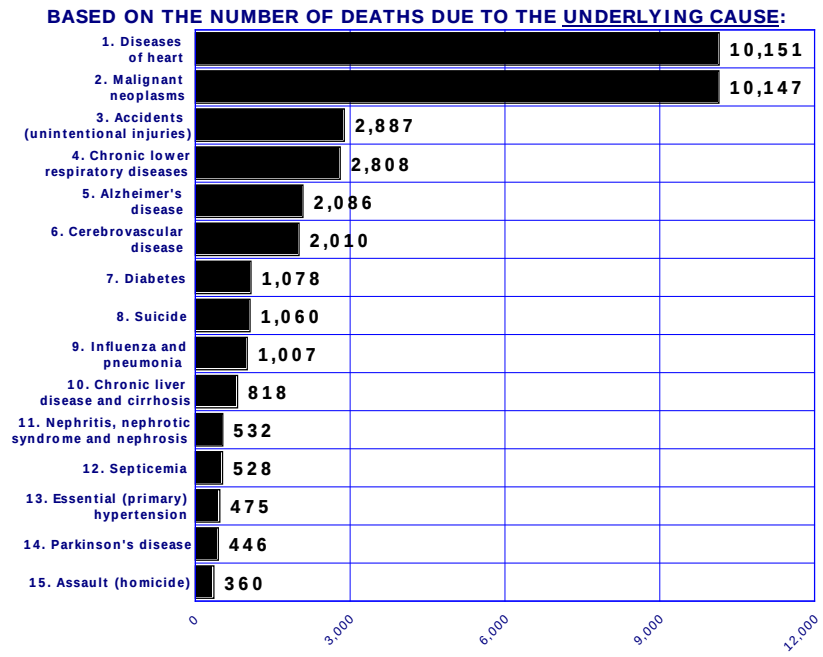
## LEADING CAUSES OF DEATH

Since 2008, the Office of Vital Records (OVR) of the Arizona Department of Health Services has been implementing a new online death registration system. In the death certificate database some of the 2008 records originated with the old and some with the new registration systems. All of the 2009 death records were registered using the new system.

Before downloading the 2009 death certificate data for analysis by the end of April, 2010, we have been testing our computer programs re-written to deal with the peculiarities of the new system (new variables, changed variable names and formats, etc.).

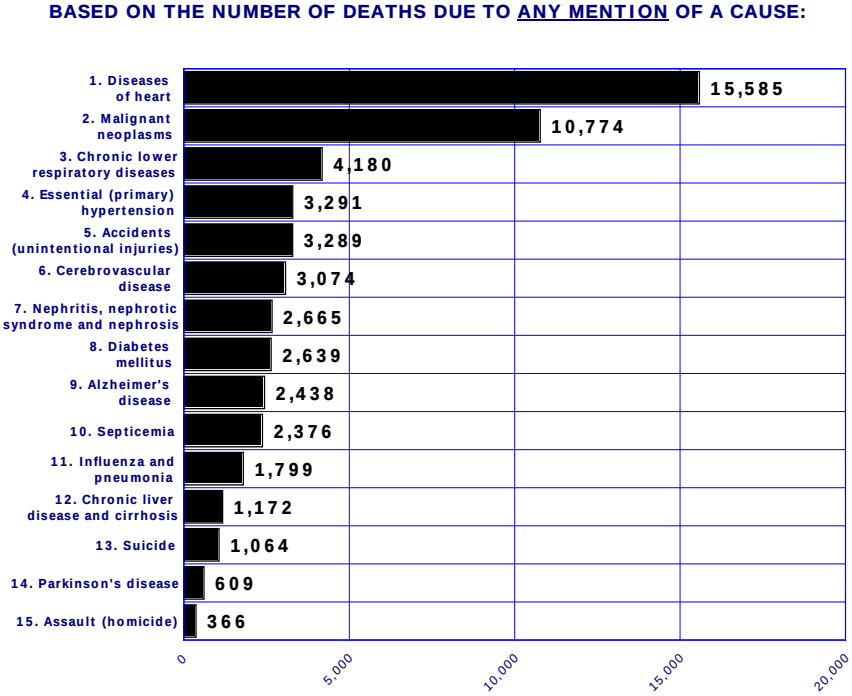
We were astonished to find out that a surprisingly large number of 2,692 deaths in 2009 had the ICD-10 codes 'R00-R99' (*Symptoms, signs, and abnormal findings*) for the underlying cause of death. A single ICD-10 code 'R99' (*Unknown cause of mortality*) was used on 2,372 death records. A more in-depth analysis proved that the **underlying cause of death was misclassified** on a great majority of these records. Unfortunately, similar misclassification by the OVR nosologist applied to (a smaller number) of the 2008 death records; those registered using the new registration system. The misclassified records were corrected in the death certificate database for both 2008 and 2009. While it was not too late to use the corrected cause-of-death data in the analysis of 2009 mortality statistics; our options were quite limited as far as the already published mortality statistics for 2008. It was not possible to re-write and re-print the bound version of the "Arizona Health Status and Vital Statistics 2008" report. Instead, we have corrected the 2008 online data products which were affected by the misclassification. In addition, our 2009 report includes corrected for misclassification data for 2008 in all time-series mortality statistics for 1990-2009 and 1999-2009.

**Figure 2B-1A**
**Leading Causes of Death among Arizona Residents in 2009**




Based on the number of deaths (but not age-adjusted mortality rate), the leading underlying cause of death to Arizona residents in 2009 continued to be *heart disease*, which accounted for 10,151 or 22.5 percent of all deaths (**Figure 2B-1A**, **Table 2B-1**, **Table 5E-14**). There were only 4 more deaths from heart disease than *cancer* (10,147) which also was responsible for 22.5 percent of all deaths in 2009. Deaths due to *accidents (unintentional injuries)* ranked third in 2009, with 2,887 resident deaths reported. The fourth leading cause of death, *chronic lower respiratory diseases* accounted for 2,808 or 6.2 percent of total deaths. Deaths due to *Alzheimer's disease* ranked fifth in 2009, with 2,086 resident deaths reported. Together, these five causes accounted for 62.3 percent of total deaths in 2009. The fifteen leading causes accounted for 80.8 percent of all deaths among Arizona residents.

**Figure 2B-1B**
**Leading Causes of Death among Arizona Residents in 2009**




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 10,151 deaths that had diseases of the heart assigned as the underlying cause, another 5,434 deaths had diseases of the heart assigned as the other than underlying cause. The sum of these two counts (15,585, **Figure 2B-1B**) is the total number of deaths that had any mention of diseases of the heart on the 2009 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 (primary) hypertension ranked 13th as the underlying cause but ranked

It is important to note that Figure 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 2009, diseases of the heart were the leading cause of death for three of the five race/ethnic groups in Arizona: American Indians, Blacks or African Americans, and Hispanics or Latinos (**Figure 2B-2, Table 2B-4**). Cancer was the number one cause among Asians or Pacific Islanders and White non-Hispanics. Unintentional injury was the third leading cause of death only for American Indians and Hispanics. For Asians and Blacks, stroke was the 3rd leading cause of death in 2009. Diabetes was among the top five causes of death among American Indians, Blacks and Hispanics, but not among Asians or White non-Hispanics (**Table 2B-4**).

Alzheimer's disease was the fifth leading cause of death only among Asians and White non-Hispanics. Chronic liver disease and cirrhosis was the fifth leading cause of death specific to American Indians. Chronic lower respiratory diseases were the third leading cause of death specific to White non-Hispanics.

**Figure 2B-2**
**Age-adjusted* Mortality Rates for the Five Leading Causes of Death for Both Genders by Race/Ethnicity, Arizona, 2009**

| Rank | Asian or Pacific Islander | American Indian or Alaska Native | Black or African American | Hispanic or Latino | White non-Hispanic |
|---|---|---|---|---|---|
| 1 | Cancer 108.1 | Diseases of heart 125.8 | Diseases of heart 171.3 | Diseases of heart 130.5 | Cancer 151.1 |
| 2 | Diseases of heart 96.7 | Cancer 113.3 | Cancer 153.1 | Cancer 128.4 | Diseases of heart 147.5 |
| 3 | Stroke 39.2 | Unintentional injury 92.6 | Stroke 42.8 | Unintentional injury 35.3 | Chronic lower respiratory diseases 45.0 |
| 4 | Unintentional injury 24.5 | Diabetes 54.2 | Unintentional injury 36.5 | Stroke 33.8 | Unintentional injury 43.3 |
| 5 | Alzheimer's disease 18.1 | Chronic liver disease and cirrhosis 54.0 | Diabetes 31.1 | Diabetes 28.1 | Alzheimer's disease 30.4 |

Number of deaths per 100,000 population age-adjusted to the 2000 U.S. standard.

Except Blacks or African Americans, cancer, not diseases of the heart, was the number one cause of death among females in all other race/ethnic groups (**Figure 2B-3**, **Table 2B-4**). Diseases of the heart were the 2nd leading cause of female mortality among Asians, American Indians, Hispanics or Latinos, and White non-Hispanic females. Alzheimer's disease was the 4th leading cause of mortality among Black or African American, Hispanic and White non-Hispanic females, and the 5th leading cause among Asian, females. Chronic liver disease and cirrhosis was the fourth leading cause of death specific to American Indian females. Chronic lower respiratory diseases were the third leading cause of death specific to White non-Hispanic females.

**Figure 2B-3**
**Age-adjusted* Mortality Rates for the Five Leading Causes of Death by Race/Ethnicity among Females, Arizona, 2009**

| Rank | Asian or Pacific Islander | American Indian or Alaska Native | Black or African American | Hispanic or Latino | White non-Hispanic |
|---|---|---|---|---|---|
| 1 | Cancer 98.7 | Cancer 103.5 | Diseases of heart 160.4 | Cancer 105.9 | Cancer 128.7 |
| 2 | Diseases of heart 80.9 | Disease of heart 100.5 | Cancer 154.2 | Diseases of heart 105.4 | Diseases of heart 114.2 |
| 3 | Stroke 35.9 | Diabetes 59.9 | Stroke 54.5 | Stroke 32.7 | Chronic lower respiratory diseases 42.1 |
| 4 | Unintentional injury 21.1 | Chronic liver disease and cirrhosis 49.9 | Alzheimer's disease 39.1 | Alzheimer's disease 30.5 | Alzheimer's disease 33.5 |
| 5 | Alzheimer's disease 20.1 | Unintentional injury 46.4 | Diabetes 34.9 | Diabetes 27.2 | Unintentional injury 30.4 |

Number of deaths per 100,000 population to the 2000 U.S. standard.

**Figure 2B-4**
**Age-adjusted* Mortality Rates for the Five Leading Causes of Death by Race/Ethnicity among Males, Arizona, 2009**

| Rank | Asian or Pacific Islander | American Indian or Alaska Native | Black or African American | Hispanic or Latino | White non-Hispanic |
|---|---|---|---|---|---|
| 1 | Cancer 122.0 | Diseases of heart 156.1 | Diseases of heart 176.1 | Diseases of heart 159.6 | Diseases of heart 186.5 |
| 2 | Diseases of heart 118.1 | Unintentional injury 144.4 | Cancer 160.3 | Cancer 157.1 | Cancer 179.8 |
| 3 | Stroke 43.6 | Cancer 127.5 | Unintentional injury 42.1 | Unintentional injury 48.2 | Unintentional in jury 56.6 |
| 4 | Chronic lower respiratory diseases 33.4 | Chronic liver disease and cirrhosis 57.9 | Chronic lower respiratory diseases 34.1 | Stroke 34.3 | Chronic lower respiratory disease 48.7 |
| 5 | Unintentional injury 27.6 | Diabetes 46.6 | Stroke 31.4 | Diabetes 29.2 | Intentional self-harm (suicide) 28.0 |

Number of deaths per 100,000 population to the 2000 U.S. standard.

Diseases of the heart followed by cancer were the two leading causes of death among American Indian, Black, Hispanic, and White non-Hispanic males (**Figure 2B-4**; **Table 2B-4**). Cancer was the first leading cause of death among Asian or Pacific Islander males, followed by diseases of the heart and stroke.

Chronic lower respiratory diseases were the 4th leading cause of death for Asian, Black, and White non-Hispanic males.

In 2009, based on the age-adjusted mortality rates, diabetes was the 5th leading cause for American Indian and Hispanic males.

**Figure 2B-5**
**Age-adjusted* Mortality Rates for the Five Leading Causes of Death by Gender in Urban** and Rural Areas, Arizona, 2009**

| Rank | Urban male | Urban female | Rural male | Rural female |
|---|---|---|---|---|
| 1 | Diseases of heart 176.5 | Cancer 124.6 | Diseases of heart 208.5 | Cancer 129.3 |
| 2 | Cancer 172.3 | Diseases of heart 112.1 | Cancer 182.6 | Diseases of heart 122.7 |
| 3 | Unintentional injury 52.0 | Chronic lower respiratory diseases 36.3 | Unintentional injury 78.4 | Chronic lower respiratory diseases 40.5 |
| 4 | Chronic lower respiratory diseases 43.2 | Alzheimer's disease 35.2 | Chronic lower respiratory diseases 49.8 | Unintentional injury 34.9 |
| 5 | Stroke 28.3 | Stroke 29.2 | Intentional self-harm (suicide) 37.0 | Stroke 28.5 |

Number of deaths per 100,000 population age-adjusted to the 2000 U.S. standard.
**Urban = Maricopa, Pima, Pinal and Yuma counties. The remaining counties comprise Arizona's rural areas.

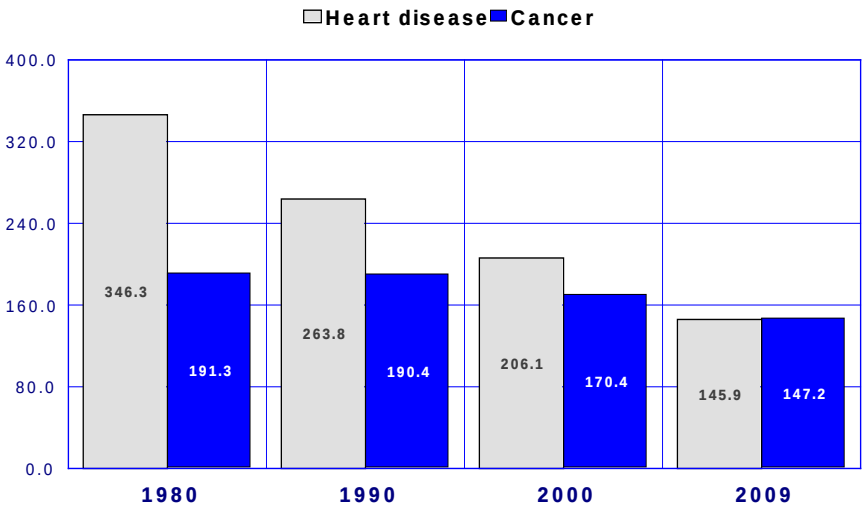
In 2009, the profile of the leading causes of death differed by gender for the residents of the urban (Maricopa, Pima, Pinal, and Yuma counties) and rural (all the remaining counties) areas of the State (**Figure 2B-5**, **Table 2B-5**). For both urban and rural males, diseases of the heart were the leading cause of death with cancer, unintentional injuries, and chronic lower respiratory diseases in second, third, and fourth positions respectively. Cancer exceeded diseases of the heart as the leading cause of death among both urban and rural females. Stroke was the fifth leading cause of death in urban and rural areas regardless of gender. Alzheimer's disease was the fourth leading cause of death among urban females. Suicide was the 5th leading cause of death specific to rural males.

**Figure 2B-6**
**Comparison of Age-adjusted* Mortality Rates for Heart Disease and Cancer (Malignant Neoplasm), Arizona, 1980, 1990, 2000 and 2009**

The age-adjusted mortality rate for diseases of the heart decreased by 57.9 percent from 346.3 deaths per 100,000 population in 1980 to 145.9/100,000 in 2009 (**Figure 2B-6**). The age-adjusted mortality rate for cancer declined substantially less by 23.1 percent during 1980-2009. In Arizona, the relative risk of death from the two leading causes changed from 81 percent greater for heart disease in 1980 to 0.9 percent greater for cancer in 2009.

In 2000, 1,436 more Arizonans died from diseases of the heart than cancer (**Table 2B-1**). In 2009, the number of deaths from heart disease exceeded the number of cancer deaths by 4.

In 2009, based on the age-adjusted mortality rates, cancer replaced diseases of the heart as the leading cause of death in Arizona.

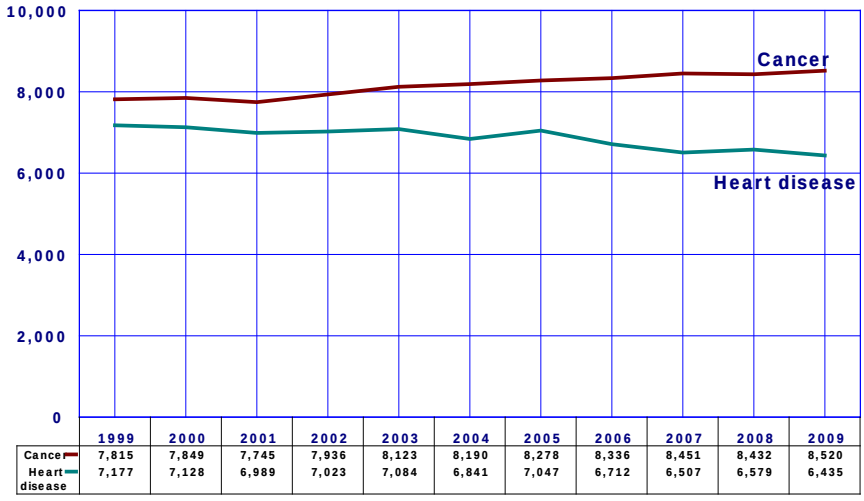



*Adjusted to the 2000 standard U.S. population.

**Figure 2B-7**
**Number of Deaths from Heart Disease and Cancer among Arizonans 0-84 Years, 1999-2009**

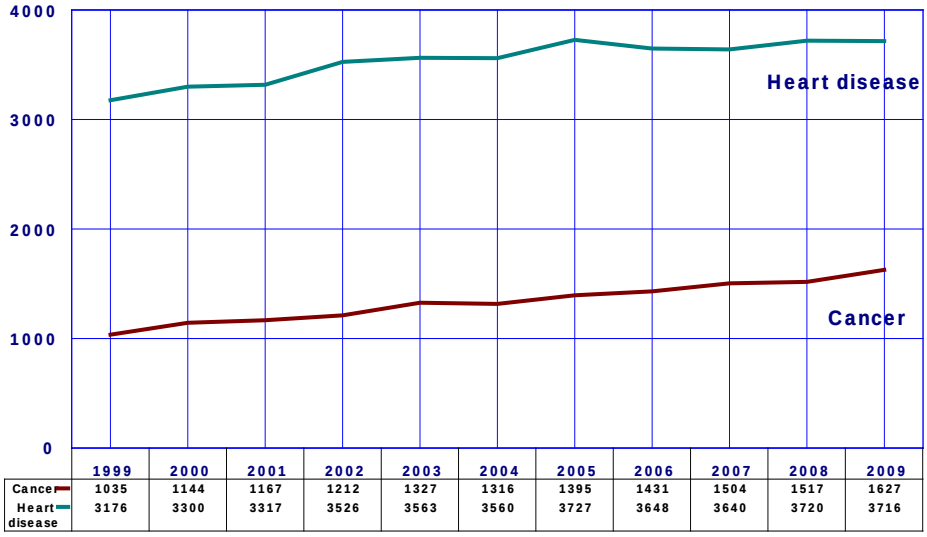
The prediction, that "in the early 21st century cancer will displace heart disease as the leading cause of death", was originally published in the 1990 edition of the *Arizona Health Status and Vital Statistics* report (p.90).

In fact, for the past fourteen years cancer has already 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 2009, 2,085 more Arizonans 0-84 years old died from cancer (8,520) than heart disease (6,435).




| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cancer | 7,815 | 7,849 | 7,745 | 7,936 | 8,123 | 8,190 | 8,278 | 8,336 | 8,451 | 8,432 | 8,520 |
| Heart disease | 7,177 | 7,128 | 6,989 | 7,023 | 7,084 | 6,841 | 7,047 | 6,712 | 6,507 | 6,579 | 6,435 |

**Figure 2B-8**
**Deaths from Heart Disease and Cancer among Arizonans 85+, 1999-2009**



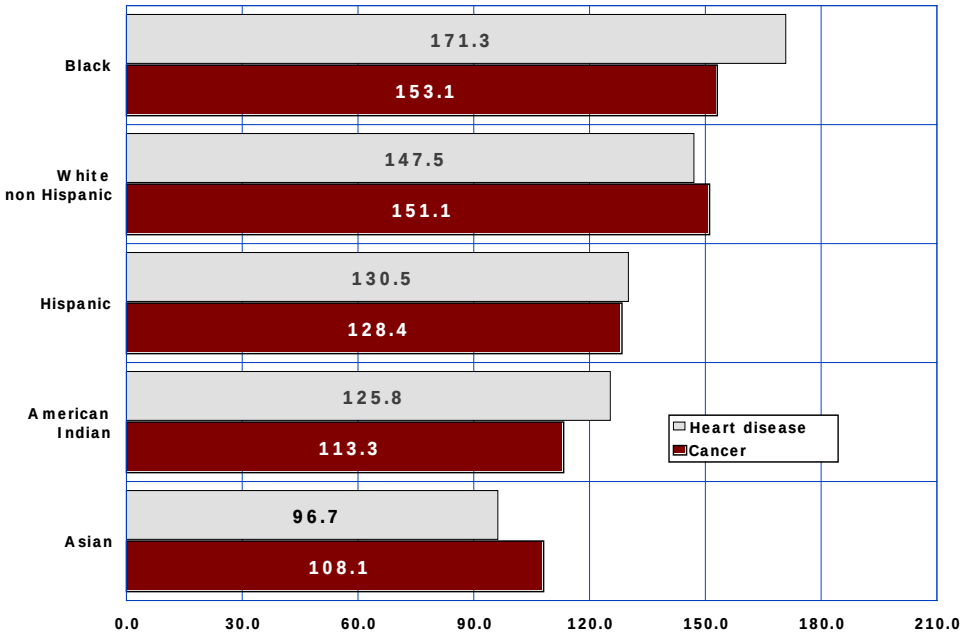

| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cancer | 1035 | 1144 | 1167 | 1212 | 1327 | 1316 | 1395 | 1431 | 1504 | 1517 | 1627 |
| Heart disease | 3176 | 3300 | 3317 | 3526 | 3563 | 3560 | 3727 | 3648 | 3640 | 3720 | 3716 |

Note: there is more information available in our special online report "***Heart Disease vs. Cancer: An Epidemiologic Transition in Mortality Risks, Arizona residents, 1990-2008***". This publication can be accessed at http://www.azdhs.gov/plan/report/epitrans/index.htm

It is only among the oldest, 85 or older, that heart disease continues to be the number one cause of death (**Figure 2B-8**). In 2009, the elderly aged 85 years or older accounted for 16.0 percent of all deaths from cancer but 36.6 percent of all deaths from heart disease. In 2009, the median age at death from heart disease was 81 years (**Table 2D-3**) and only a minority of deaths (42.1 percent, **Table 2D-4**) was premature, i.e., before reaching the expected years of life at birth for all U.S. residents (77.7 years in 2006).

However, from 1999 to 2009, the number of deaths from cancer increased by 57.2 percent among Arizonans 85 years or older, a 3.4 times greater rise than the one seen for diseases of the heart (a 17.0 percent increase).

**Figure 2B-9**
**Age-adjusted Mortality Rates for Heart Disease and Cancer by Race/Ethnicity, Arizona, 2009**




Number of deaths per 100,000 population age-adjusted to the 2000 U.S. standard.

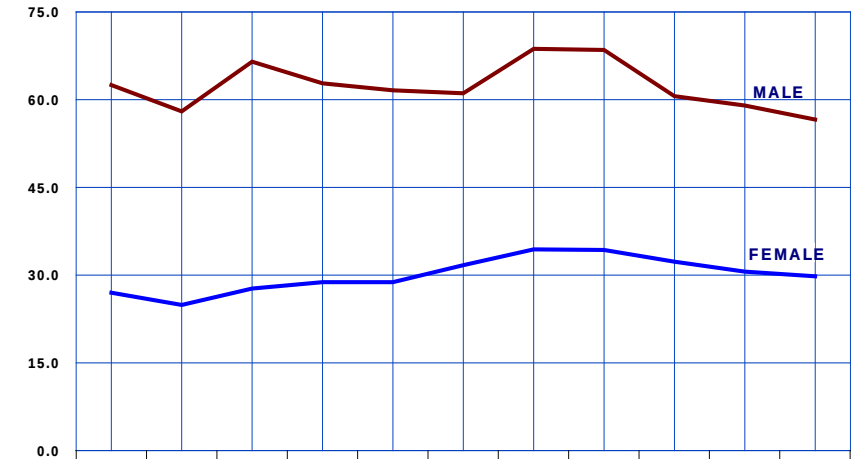
Arizona's Blacks were 1.8 times more likely to die from diseases of the heart and 1.4 times more likely to die from malignant neoplasms in 2009 than Asians, the group at the lowest risk of both heart disease and cancer death among race/ethnic groups (**Figure 2B-9**, **Table 2B-4**).

Among Asians and White non-Hispanics, the relative risk of death from cancer exceeded the mortality risk of death from heart disease in 2009 (**Table 2B-3**).

The number of deaths from unintentional injuries decreased by 8.5 percent from 3,156 in 2006 to and 2,887 in 2009 (**Table 2B-1**). In 2009, 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 2005 to 2009 the age-adjusted mortality for accidents decreased by 17.6 percent for males and by 13.4 percent for females (**Figure 2B-10**).

In 2009, the number of deaths in motor vehicle accidents declined to 771, the lowest annual number of deaths since 1991. (Due to high unemployment and high gas prices there were, arguably, fewer drivers on Arizona roads, and less driving). In contrast, Arizonans experienced particularly large increase in the number of accidental drug overdoses from 383 deaths in 1999 to 802 deaths in 2009. In 2009, the number of deaths from accidental poisoning by drugs exceeded the number of deaths from motor vehicle-related injuries (**Table 2B-9**).

**Figure 2B-10**
**Age-adjusted Mortality Rates for Accidents (unintentional injuries) by Gender and Year, Arizona, 1999-2009**



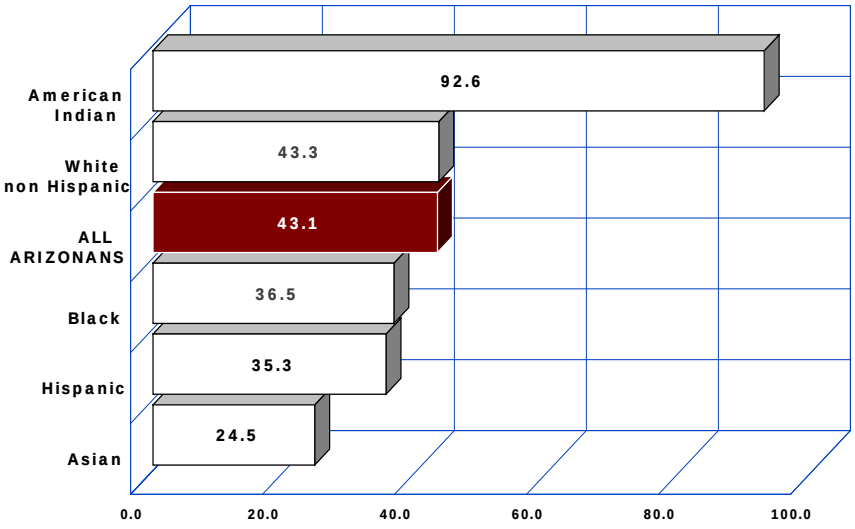

| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | 27.0 | 24.9 | 27.7 | 28.8 | 28.8 | 31.7 | 34.4 | 34.3 | 32.3 | 30.6 | 29.8 |
| Male | 62.5 | 58.0 | 66.5 | 62.8 | 61.6 | 61.1 | 68.7 | 68.5 | 60.6 | 59.0 | 56.6 |

Number of deaths per 100,000 population age-adjusted to the 2000 U.S. standard.

The American Indian death rate for unintentional injuries (92.6/100,000) was 3.8 times greater than the rate for Asians (24.5/100,000), the group at the lowest risk of unintentional injury death among race/ethnic groups in the State (**Figure 2B-11**, **Table 2B-4**).

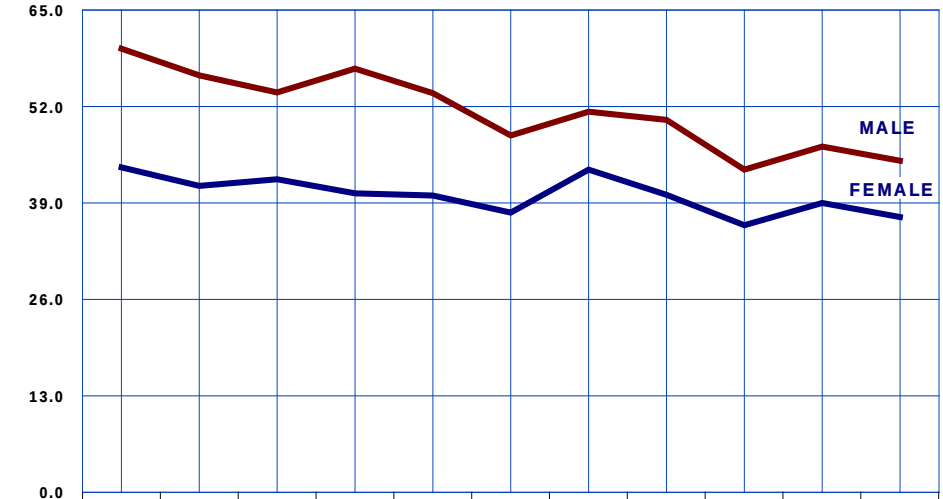
In 2008, Apache (116.3/100,000) and Navajo (94.5/100,000) counties had the two highest age-adjusted mortality rates for unintentional injuries (**Table 5E-11**).

**Figure 2B-11**
**Age-adjusted Mortality Rates for Accidents (unintentional injuries) by Race/Ethnicity, Arizona, 2009**




Number of deaths per 100,000 population age-adjusted to the 2000 U.S. standard.

**Figure 2B-12**
**Age-adjusted Mortality Rates for Chronic Lower* Respiratory Diseases by Gender and Year, Arizona, 1999-2009**



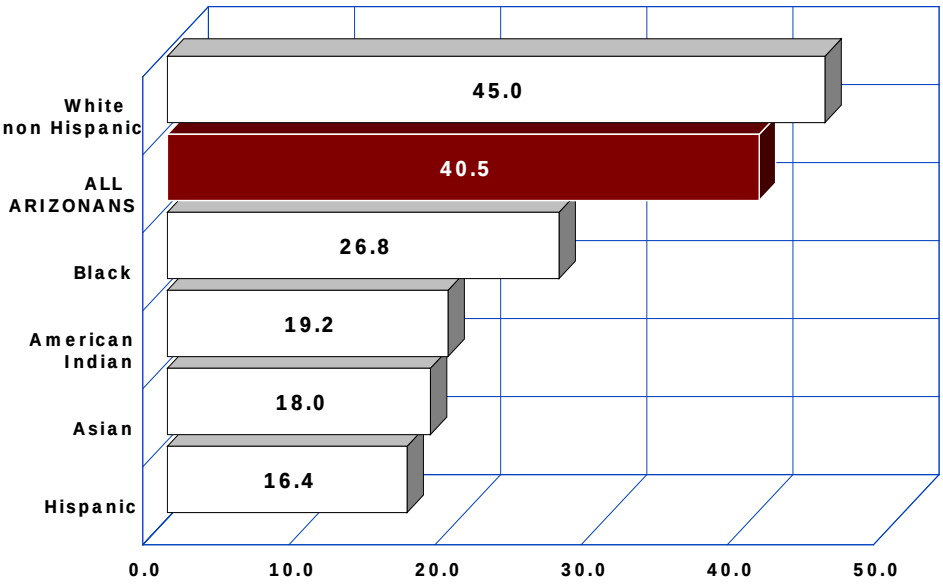

| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | 43.8 | 41.3 | 42.2 | 40.3 | 40.0 | 37.7 | 43.5 | 40.1 | 36.0 | 39.0 | 37.1 |
| Male | 59.8 | 56.2 | 53.9 | 57.1 | 53.8 | 48.1 | 51.3 | 50.2 | 43.5 | 46.6 | 44.7 |

In 2009, chronic lower respiratory diseases (bronchitis, emphysema, asthma) were the 4th leading cause of death among Arizona residents (**Table 2B-1**). From 2008 to 2009, the mortality rates for chronic lower respiratory diseases (CLRD) decreased for both genders (**Figure 2B-12**, **Table 2B-2**

Urban females had the lowest mortality rate for CLRD (36.3/100,000) among the gender by region groups (**Table 2B-5**). Rural males, the group at the highest mortality risk for CLRD (49.8/100,000), were 15.3 percent more likely in 2009 to die from this cause than urban males (43.2 deaths per 100,000).

*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)

**Figure 2B-13**
**Age-adjusted Mortality Rates for Chronic Lower* Respiratory Diseases by Race/Ethnicity, Arizona, 2009**



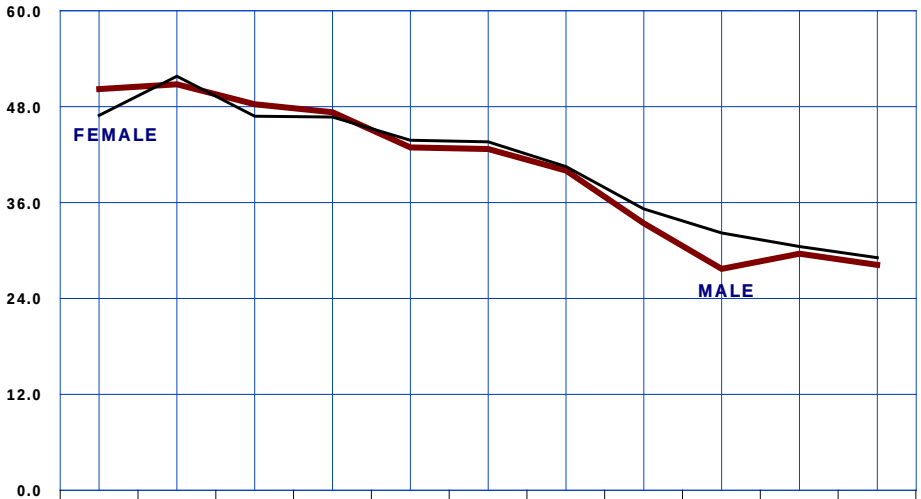

Death rates for emphysema, chronic bronchitis, asthma and other lower respiratory disorders were substantially higher among White non-Hispanics (45.0 deaths per 100,000) than they were among Blacks or African American (26.8/100,000), American Indians (19.2/100,000), Asians (18.0/ 100,000), and Hispanic or Latinos (16.4/100,000; **Figure 2B-13**, **Table 2B-4**).

Number of deaths per 100,000 population age-adjusted to the 2000 U.S. standard.

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 stroke decreased by 40.4 percent from 48.5 deaths per 100,000 population in 1999 to 28.9/100,000 in 2009 (**Table 2B-3**).

In 2002, the number of deaths from cerebrovascular disease was greater among females (1,167) than males (843, **Table 2B-4**). Females remained at greater risk than males to die from a stroke in 2003-2009, as they were in 2000 (**Figure 2B-14**). In 2009 the age-adjusted mortality rate for stroke decreased for both males and females (**Figure 2B-14**, **Table 2B-2**).

**Figure 2B-14**
**Age-adjusted Mortality Rates for Cerebrovascular Disease by Gender and Year, Arizona, 1999-2009**



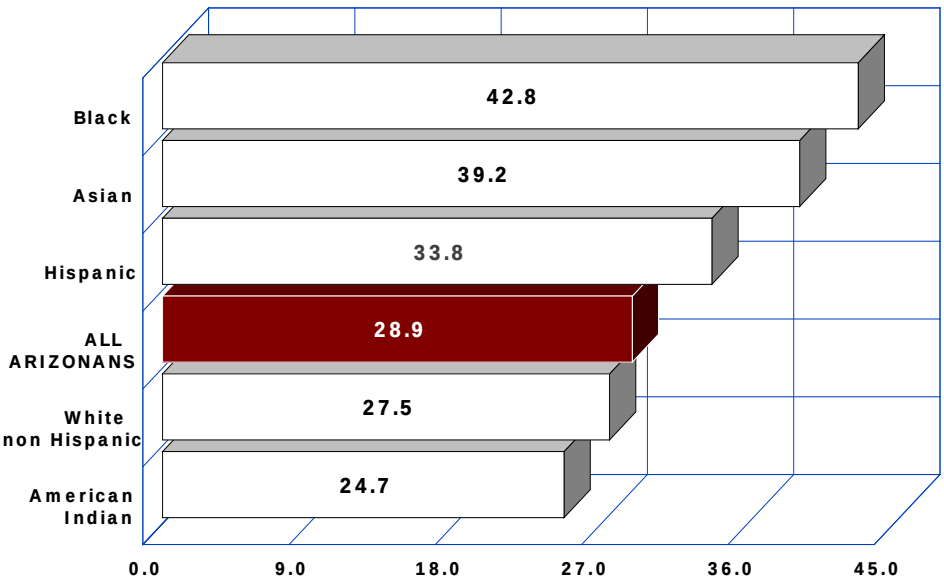

| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | 46.9 | 51.8 | 46.8 | 46.7 | 43.8 | 43.6 | 40.5 | 35.2 | 32.2 | 30.5 | 29.1 |
| Male | 50.2 | 50.8 | 48.3 | 47.3 | 42.9 | 42.7 | 40.0 | 33.4 | 27.7 | 29.6 | 28.2 |

Number of deaths per 100,000 population age-adjusted to the 2000 U.S. standard.

Compared to Arizona's rate, Blacks or African Americans were 48.1 percent more likely to die from cerebrovascular disease in 2009 (**Figure 2B-15**, **Table 2B-4**). The 2009 mortality rate for cerebrovascular disease among American Indians (24.7/100,000) was the lowest among race/ethnic groups.

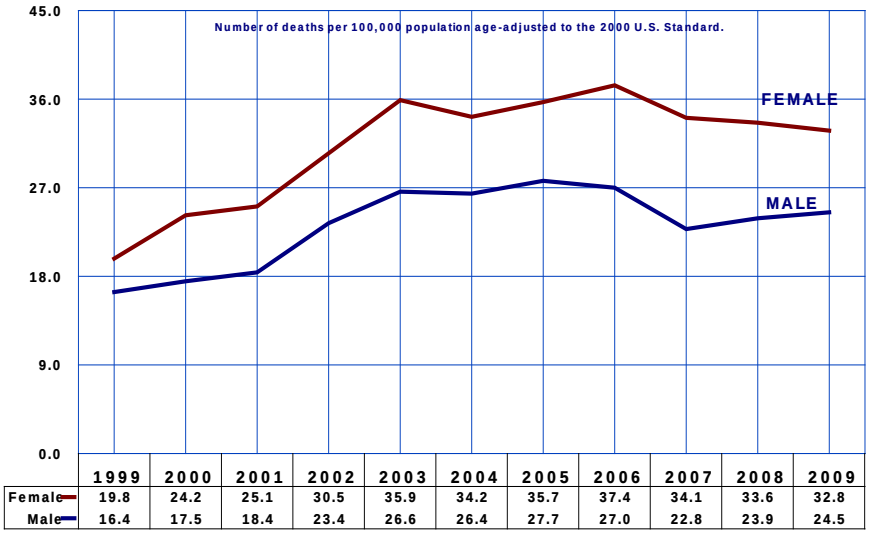
American Indian females had the lowest mortality rate for cerebrovascular disease among gender by race subgroups (20.0 deaths per 100,000, **Table 2B-4**), while Asian or Pacific Islander males had the highest rate of 43.6 deaths per 100,000.

**Figure 2B-15**
**Age-adjusted Mortality Rates for Cerebrovascular Disease by Race/Ethnicity, Arizona, 2009**




Number of deaths per 100,000 population age-adjusted to the 2000 U.S. standard.

**Figure 2B-16**
**Age-adjusted Mortality Rates for Alzheimer's Disease by Gender and Year, Arizona, 1999-2009**




| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | 19.8 | 24.2 | 25.1 | 30.5 | 35.9 | 34.2 | 35.7 | 37.4 | 34.1 | 33.6 | 32.8 |
| Male | 16.4 | 17.5 | 18.4 | 23.4 | 26.6 | 26.4 | 27.7 | 27.0 | 22.8 | 23.9 | 24.5 |

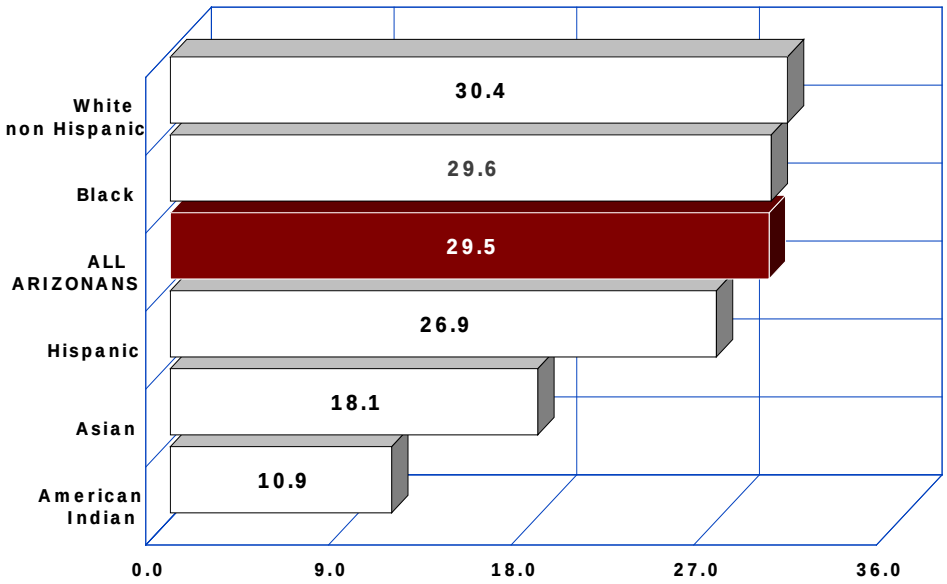
Note: The rates for 1998-1999 are comparability-modified.

Based on the number of deaths in 2009, Alzheimer's disease was the 4th leading cause of death for females and 7th leading cause for males (**Table 2B-4**).

The age-adjusted mortality rate for Alzheimer's disease among females decreased for the third consecutive year by 12.3 percent from 37.4/100,000 in 2006 to 32.8 /100,000 in 2009 (**Figure 2B-16**). The age-adjusted mortality rate for Alzheimer's disease increased for the second consecutive year for males by from 22.8/100,000 in 2007 to 24.5/100,000 in 2009

In 2008, the age-adjusted death rate for Alzheimer's disease was 33.9 percent higher for females than for males.

**Figure 2B-17**
**Age-adjusted Mortality Rates for Alzheimer's Disease by Race/Ethnicity, Arizona, 2009**




Number of deaths per 100,000 population age-adjusted to the 2000 U.S. standard.

The age-adjusted mortality rates for Alzheimer's disease in 2009 were higher among White non-Hispanic (30.4 deaths per 100,000) and Black or African American (29.6/100,000) than they were among Hispanic or Latino (26.9/100,000), Asian (18.1/100,000), and American Indian residents of Arizona (10.9/100,000; **Figure 2B-17**, **Table 2B-4**).

White non-Hispanic residents of Arizona disproportionately contributed to mortality from Alzheimer's disease. In 2009, White non-Hispanics accounted for 60.3 percent (**Table 10C-1**) of the State's population, but 88.8 percent of all deaths from Alzheimer's disease (1,854 out of 2,086; **Table 2B-4**).

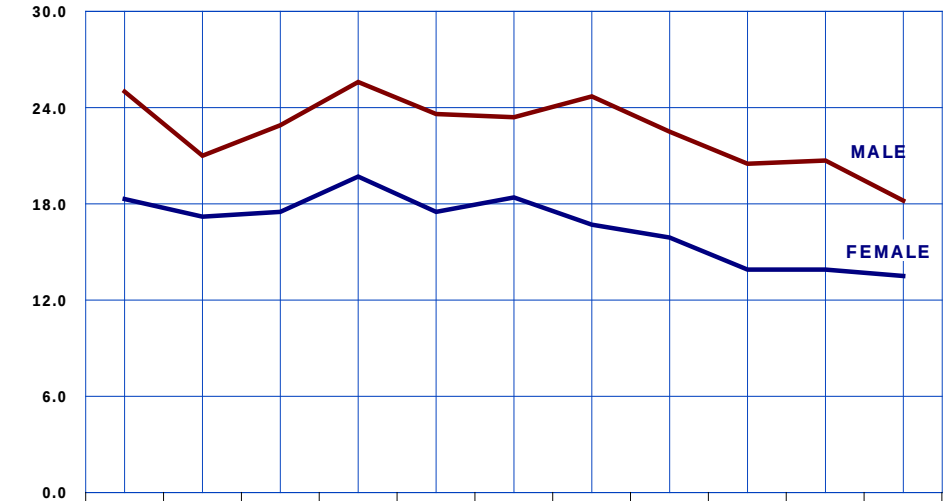
In 2009, the median age at death from Alzheimer's disease was 88 for females and 86 for males (**Table 2D-3**).

Both in 1999 and 2009, diabetes was the 7th leading cause of death among Arizona residents (**Table 2B-1**). Both men and women experienced a decline in mortality rates for diabetes from 2005 to 2009 (**Figure 2B-18**).

In 2009, in addition to 1,078 deaths that had diabetes assigned as the underlying cause, another 1,561 deaths had diabetes assigned as a contributing factor (**Figure 2B-1B**. The diabetes-related death rate of 38.2/100,000 (**Table 6A-6**) was 2.4 times greater than the rate for diabetes as underlying cause (15.7/100,000, **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.

**Figure 2B-18**
**Age-adjusted Mortality Rates for Diabetes by Gender and Year, Arizona, 1999-2009**



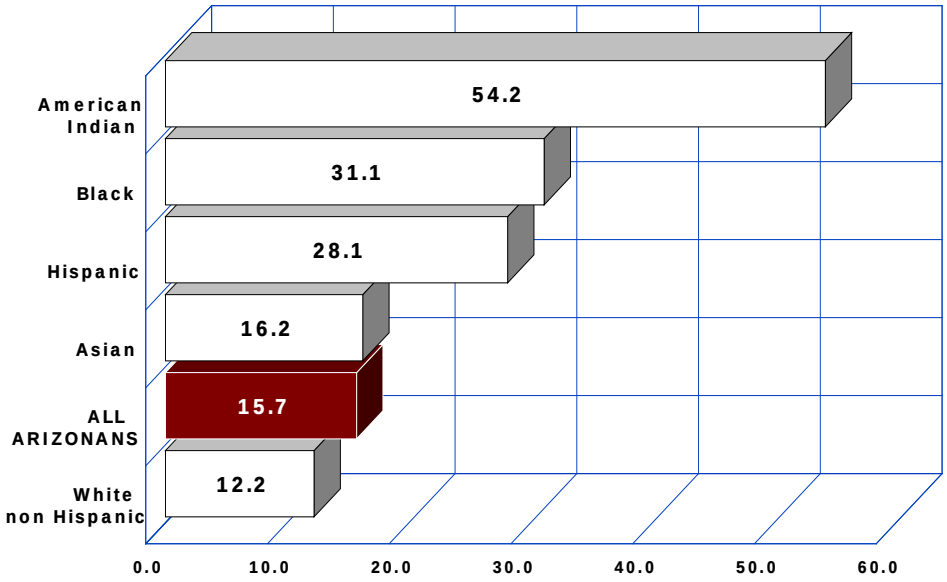

| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | 18.3 | 17.2 | 17.5 | 19.7 | 17.5 | 18.4 | 16.7 | 15.9 | 13.9 | 13.9 | 13.5 |
| Male | 25.0 | 21.0 | 22.9 | 25.6 | 23.6 | 23.4 | 24.7 | 22.5 | 20.5 | 20.7 | 18.2 |

Number of deaths per 100,000 population age-adjusted to the 2000 U.S. standard.

In 2009, compared to Arizona's rate, American Indians were 3.5 times more likely to die from diabetes (54.2 deaths per 100,000; **Figure 2B-19**, **Table 2B-4**). The rate of 12.2 deaths per 100,000 among White non-Hispanics was the lowest rate among race/ethnic groups in the State.

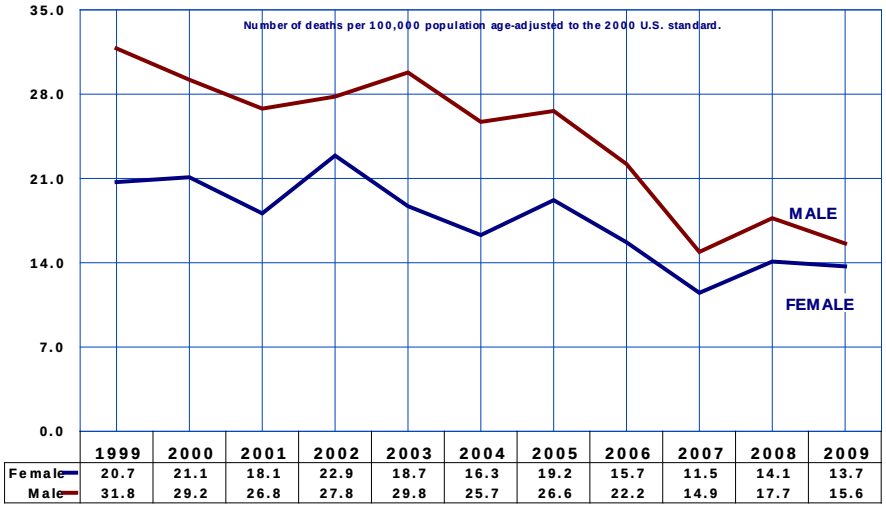
Among the 15 Arizona counties, in 2009 Apache (40.4/100,000), Greenlee (41.4/100,000), and Graham (37.2 /100,000) had the highest mortality rates for diabetes (**Table 5E-11**).

**Figure 2B-19**
**Age-adjusted Mortality Rates for Diabetes by Race/Ethnicity, Arizona, 2009**




Number of deaths per 100,000 population age-adjusted to the 2000 U.S. standard.

**Figure 2B-20**
**Age-adjusted Mortality Rates for Influenza and Pneumonia by Gender and Year, Arizona, 1999-2009**




| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | 20.7 | 21.1 | 18.1 | 22.9 | 18.7 | 16.3 | 19.2 | 15.7 | 11.5 | 14.1 | 13.7 |
| Male | 31.8 | 29.2 | 26.8 | 27.8 | 29.8 | 25.7 | 26.6 | 22.2 | 14.9 | 17.7 | 15.6 |

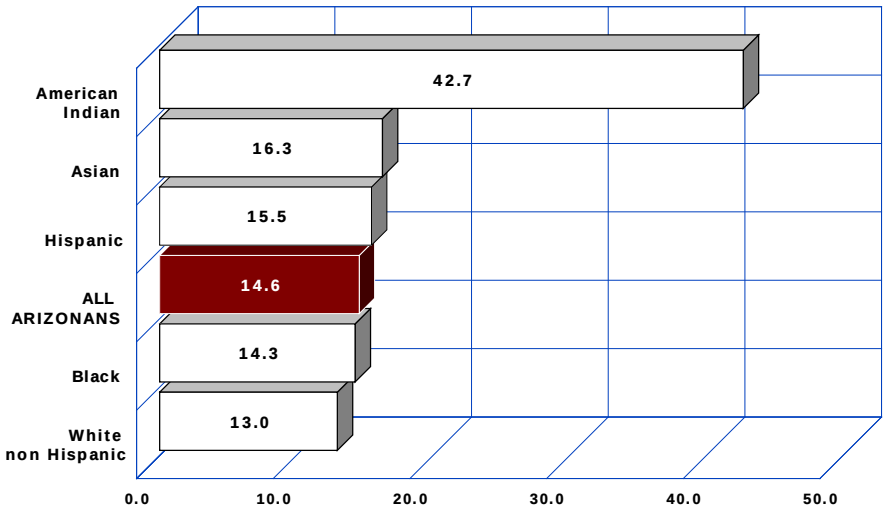
Note: The rate for 1999 is based on the number of deaths according to ICD-9. The rates for 2000 and beyond are based on the number of deaths according to ICD-10. For comparability, the rate for 1999 was adjusted using the preliminary comparability ratio of 0.6982 from NCHS. Comparability ratio of 1.0 indicates that the same number of deaths was assigned to a cause of death whether ICD-9 or ICD-10 was used.

The number of deaths from influenza and pneumonia decreased by 6.3 percent from 1,075 in 2008 to 1,007 in 2009 (**Table 2B-1**). In 2009, influenza and pneumonia were ranked the 8th leading cause of death in Arizona. Among the 1,007 deaths, influenza was identified as the underlying cause for 19 of them, while pneumonia was listed as the underlying cause on 1,041 death certificates (**Table 2B-6**).

The mortality rate for influenza and pneumonia decreased for females from 14.1 deaths per 100,000 in 2008 to 13.7 deaths in 2009 (**Figure 2B-20, Table 2B-2**). The mortality rate for influenza and pneumonia also decreased for males from 17.7 deaths per 100,000 in 2008 to 15.6/100,000 in 2009.

In 2008, Arizona males were 13.9 percent more likely to die from influenza and pneumonia than females.

**Figure 2B-21**
**Age-adjusted Mortality Rates for Influenza and Pneumonia by Race/Ethnicity, Arizona, 2009**




Number of deaths per 100,000 population age-adjusted to the 2000 U.S. standard.

In 2009, American Indian residents of Arizona had the highest mortality rate for influenza and pneumonia (42.7 deaths per 100,000) among the race/ethnic groups. The age-adjusted mortality of 13.0/100,000 among White non-Hispanics was the lowest rate among race/ethnic groups in the State (**Figure 2B-21**, **Table 2B-4**).

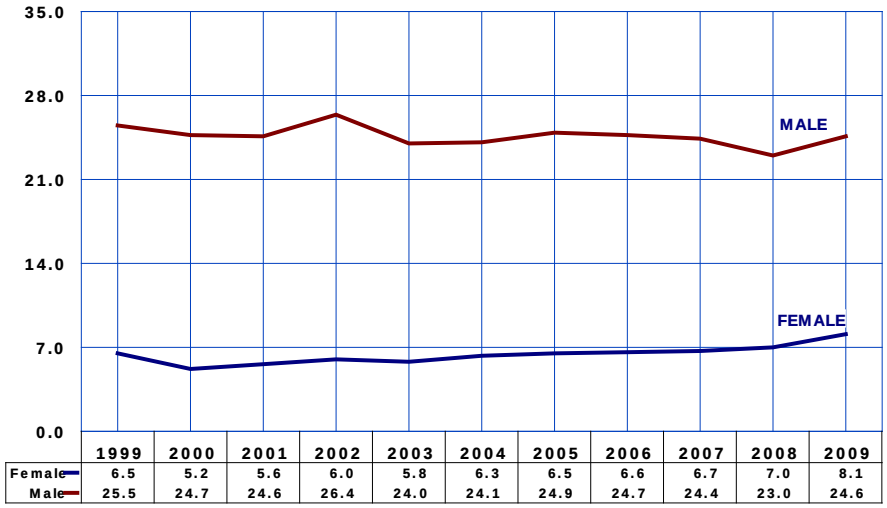
Compared to the State death rate for influenza and pneumonia, Graham County's rate was 2.5 times greater (36.8/100,000). The mortality rates also were elevated in Apache (35.7/100,000) and Navajo (30.4) counties (**Table 5E-11**).

In 2009, suicide was the 6th leading cause of death among males. It ranked as the 9th cause of mortality for females. The age-adjusted suicide rate increased by 8.8 percent from 14.8 suicides per 100,000 residents of the State in 2008 to 16.1/100,000 in 2009; the highest suicide rate since 1998 (**Table 2B-3**).

The suicide rate increased for females from 7.0 suicides per 100,000 in 2008 to 8.1 in 2009 (**Figure 2B-22**, **Table 2B-3**). The male mortality risk for suicide also increased from the 2008 rate of 23.0/100,000 to 24.6/100,000 in 2009.

In 2009, suicide posed a 3 times greater mortality risk for males (24.6/100,000) than females (8.1/100,000).

**Figure 2B-22**
**Age-adjusted Mortality Rates for Suicide by Gender and Year, Arizona, 1999-2009**




| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | 6.5 | 5.2 | 5.6 | 6.0 | 5.8 | 6.3 | 6.5 | 6.6 | 6.7 | 7.0 | 8.1 |
| Male | 25.5 | 24.7 | 24.6 | 26.4 | 24.0 | 24.1 | 24.9 | 24.7 | 24.4 | 23.0 | 24.6 |

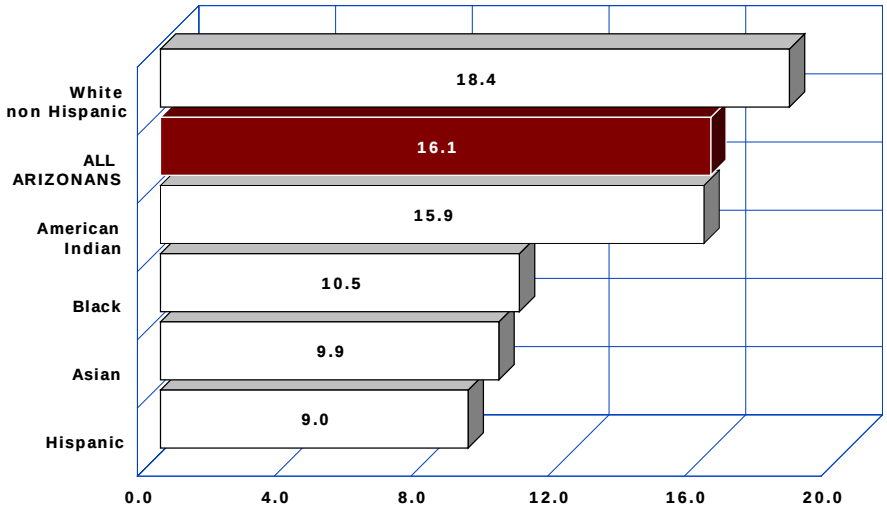
Number of deaths per 100,000 population age-adjusted to the 2000 U.S. standard.

In 2009, White non-Hispanics (had the highest age-adjusted suicide rate (18.4 suicides per 100,000) among the race/ethnic groups (F**igure 2B-23**, **Table 2B-4**).

From 2008 to 2009 the suicide rates increased for each gender and race/ethnic group, except Asians (**Table 2B-3**). The suicide rate more than doubled for Hispanic or Latino females (1.9 vs. 3.9), and it increased 1.9 times for Asian or pacific Islander males (10.7 vs. 19.9; **Table 2B-3**).

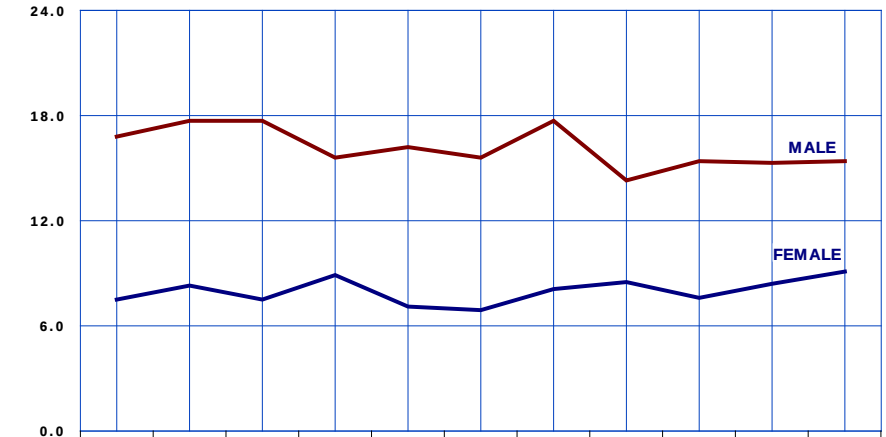
The age-adjusted mortality rates varied in Arizona in 2009 from 8.1 suicides per 100,000 residents of Greenlee County to 29.2 suicides per 100,000 residents of Mohave County, and 45.3/100,000 among La Paz County residents (**Table 5E-11**).

**Figure 2B-23**
**Age-adjusted Mortality Rates for Suicide by Race/Ethnicity, Arizona, 2009**




Number of deaths per 100,000 population age-adjusted to the 2000 U.S. standard.

**Figure 2B-24**
**Age-adjusted Mortality Rates for Chronic Liver Disease and Cirrhosis by Gender and Year, Arizona, 1999-2009**




| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | 7.5 | 8.3 | 7.5 | 8.9 | 7.1 | 6.9 | 8.1 | 8.5 | 7.6 | 8.4 | 9.1 |
| Male | 16.8 | 17.7 | 17.7 | 15.6 | 16.2 | 15.6 | 17.7 | 14.3 | 15.4 | 15.3 | 15.4 |

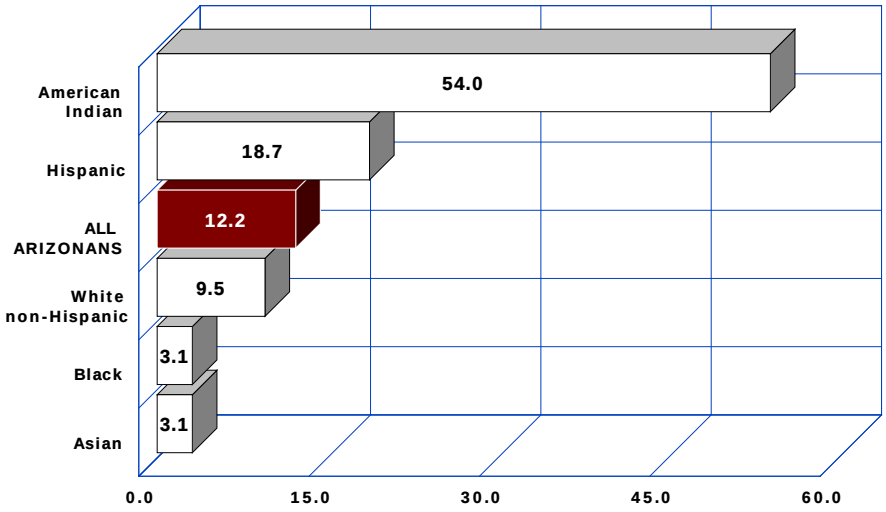
The number of deaths per 100,000 population age-adjusted to the 2000 U.S. standard.

Chronic liver disease and cirrhosis was the 10th leading cause of death in Arizona in 2009 (**Figure 2B-1, Table 2B-1**). Among the 818 deaths due to chronic liver disease and cirrhosis, 499 (61.0 percent) were males (**Table 2B-4**).

Among females the age-adjusted mortality rate for chronic liver disease and cirrhosis increased for the 2nd consecutive year from 7.6/100,000 in 2007 to 9.1/100,000 in 2009. Among males, the mortality remained unchanged in 2007-2009 (**Figure 2B-24**, **Table 2B-3**).

In 2009, La Paz, Navajo, and Mohave counties had the highest mortality rates for chronic liver disease and cirrhosis (**Table 5E-11**).

**Figure 2B-25**
**Age-adjusted Mortality Rates for Chronic Liver Disease and Cirrhosis by Race/Ethnicity, Arizona, 2009**




Number of deaths per 100,000 population age-adjusted to the 2000 U.S. standard.

The 2009 death rate for chronic liver disease and cirrhosis among American Indians (54.0 deaths per 100,000) was 17.4 times greater than the rate among Asians or Blacks (3.1/100,000) (**Figure 2B-25, Table 2B-4**). The rate for Hispanics (18.7 deaths per 100,000 population) was the second highest among race/ethnic groups in the State.

Compared to the median age at death from all causes (76 years), those who died from chronic liver disease and cirrhosis were 18 years younger (58 years, **Table 2D-3**). In 2009, the median age at death of American Indians who died from chronic liver disease and cirrhosis was only 48 years (**Table 2D-3**).