



**2B.**

### **LEADING CAUSES OF DEATH**

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Beginning with the 2000 data year in Arizona (1999 nationally) two major changes have occurred that affect the computation of mortality rates, tabulation of leading causes of death and analyses of mortality data over time. First, a new revision of the International Classification of Diseases (ICD), used to classify causes of death, was implemented. The Tenth Revision (ICD-10) has replaced the Ninth Revision (ICD-9), which was in effect since 1979. Second, a new population standard for the age adjustment of mortality rates has replaced the standard based on the 1940 population and used since 1943. The new set of age-adjustment weights uses the year 2000 estimated U.S. population as a standard.

Both changes have profound effects on the comparability of mortality data and continuity in statistical trends. Age-adjusted rates can only be compared to other age-adjusted rates that use the same population standard. In this report, ALL age-adjusted mortality rates (including those for 1980, 1990, and 1995-2005) are based on the (new) 2000 standard, and they CANNOT BE compared to rates using the 1940 standard population. This is because the age structures of the 1940 and year 2000 populations differ. From 1940 to 2000 the U.S. population "aged" considerably. The age-adjusted rates based on the year 2000 standard are different because the year 2000 population standard, which has an older age structure, gives more weight than the 1940 standard to death rates at older ages where mortality is higher. More than 1,800 age-adjusted mortality rates in this report were recomputed for the new population standard so that mortality rates can be compared over time.

Breaks in comparability of mortality statistics effective with deaths occurring in 2000 also result from the implementation of ICD-10. ICD-10 is far more detailed than ICD-9, with about 8,000 categories compared with about 5,000 categories. Some of the coding rules and rules for selecting the underlying cause of death have been changed. Moreover, cause-of-death titles have been changed and the cause-of-death categories regrouped.

The new population standard and the revision of the ICD are not the only factors affecting the comparability of cause of death and the continuity of statistical trends in mortality. The mortality data for Arizona residents for 1999-2005 are not quite as complete as they used to be in the past. There seems to be a problem with the out-of-State deaths of the residents of Arizona: their records (copies of death certificates from other states) are not always sent to the Office of Vital Records of the Arizona Department of Health Services:

Data year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<b>Reported out-of-State deaths of AZ residents</b>	1,608	1,431	1,569	792	844	1,009	678	640	714	553

Since mortality rates express the likelihood (or risk) of death in a specified population (i.e., all Arizona residents) regardless of the place of occurrence, missing data about the number of events in the numerator (i.e., resident deaths occurring out-of-State) continue to contribute to misrepresentation of mortality risks for Arizonans.

In particular, mortality rates for 1999-2005 were understated because the numerators used to calculate them were too small.

Another disturbing peculiarity of the mortality data collection process are records where cause of death is missing. The majority of those records are, again, for Arizonans who died outside Arizona in 2005. Unfortunately, missing cause of death accounted in 2005 for 37 records, more than Hodgkin's disease or influenza.

Data year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<b>Missing cause of death</b>	16	30	12	11	197	970	704	532	118	37

As a result, the cause-of-death-specific numbers and rates for 2000-2005 also have been understated.

Last but not least, before data for 2000, mortality medical information was based on manual coding of an underlying death for each certificate in accordance with WHO rules, and done locally by the Office of Vital Records. Effective with the 2000 data year, cause-of-death data presented in this publication were coded by the National Center for Health Statistics, using computerized procedures of SuperMICAR (Mortality Medical Indexing and Retrieval) and ACME (Automated Classification of Medical Entities) systems.

The conversion to computerized coding contributed to at least some of the breaks in comparability over time of cause-of-death statistics for *drug-induced deaths*, *intentional self-harm (suicide)*, *firearm-suicide*, and *accidental discharge of firearms*:

Data year	1999	2000	2001	2002	2003	2004	2005
<b>Drug-induced deaths</b>	543	331	577	645	646	745	799
<b>Suicide</b>	773	737	600	855	807	854	915
<b>Suicide by firearms</b>	495	486	358	544	476	498	507
<b>Accidental discharge of firearms</b>	7	11	114	26	13	13	15

Unprecedented decline in 2001 in the number of suicides and the equally unprecedented increase in the number of firearm deaths classified as accidental obviously are associated. Approximately 100 firearm fatalities, that would have been classified as suicides had the manual coding system been in place, were classified as accidents in 2001 because the "manner of death" was not indicated and the automated coding system defaulted to accidental injury.

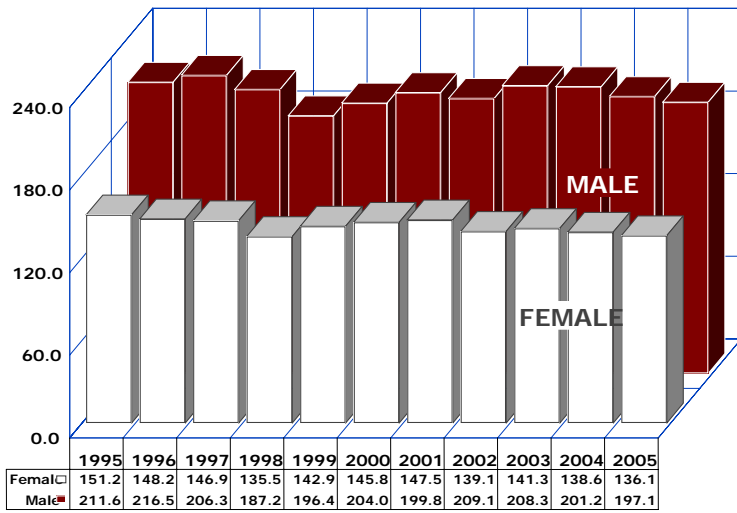
Some experience is usually necessary before the data are collected and coded as accurately and completely as possible in changed circumstances. Data in future years will indicate if this assumption is reasonable.





2B. LEADING CAUSES OF DEATH  
**Malignant neoplasms**

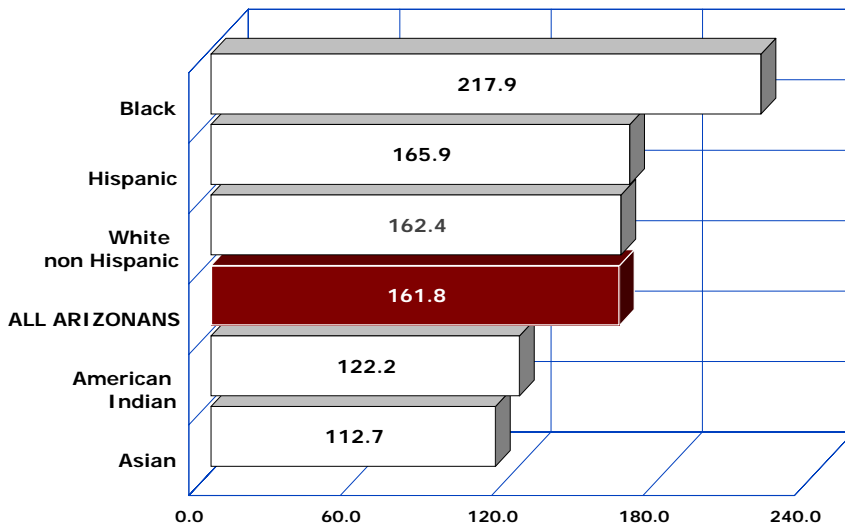
**Figure 2B-4**  
**Age-Adjusted Mortality Rates for Malignant Neoplasms**  
**(cancer) by Gender and Year, Arizona, 1995-2005**



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

Cancer ranked as the 2<sup>nd</sup> leading cause of death for both males and females. It was mentioned on 10,475 death certificates and it was assigned as the underlying cause for the majority (9,673 or 92.3 percent) of these deaths. In 2005, among the 9,673 deaths from cancer, 5,184 were male (53.6 percent) and 4,489 were female. The age-adjusted cancer mortality rate decreased for Arizona males from 201.2 deaths per 100,000 males in 2004 to 197.1/100,000 in 2005. The female cancer death rate decreased from 138.6 per 100,000 in 2004 to 136.1/100,000 in 2005. The gender gap in cancer mortality slightly broadened from 39.9 percent greater risk for males than females in 1995, to a 44.8 percent greater risk in 2005 (Figure 2B-4).

**Figure 2B-5**  
**Age-Adjusted Mortality Rates for Malignant Neoplasms**  
**(cancer) by Race/Ethnic Group, Arizona, 2005**



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

Arizona's Blacks were 1.9 times more likely to die from malignant neoplasms in 2005 than Asians, the group at the lowest risk of cancer death among race/ethnic groups (Figure 2B-5, Table 2B-4).

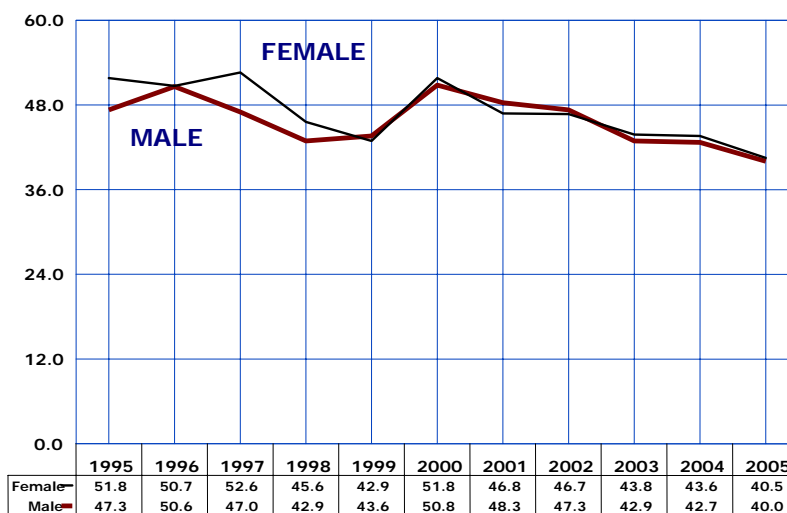
Among males, Asians had the lowest cancer mortality rate (122.5 deaths per 100,000; Table 2B-4). Among females, the lowest cancer mortality rate (97.5 per 100,000) was that of American Indians.

Black males had the highest mortality rates for lung cancer and Black females had the highest mortality rate for colorectal cancer among gender by race subgroups (Table 2B-4).

2B. LEADING CAUSES OF DEATH  
Cerebrovascular disease

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. In 2005, the number of deaths from cerebrovascular disease was greater among females (1,374) than males (951, **Table 2B-4**). However, the gender differential, i.e. the ratio of female to male mortality rates was miniscule. The 2005 female mortality risk for a stroke death (40.5/100,000) exceeded the male risk of 40.0/100,000 by a mere 1.3 percent (**Figure 2B-6, Table 2B-2**).

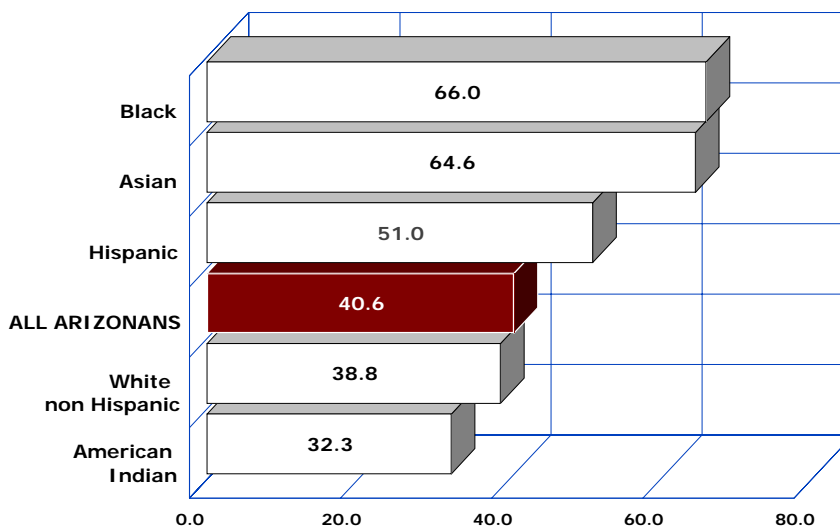
**Figure 2B-6**  
**Age-Adjusted Mortality Rates for Cerebrovascular Disease by Gender and Year, Arizona, 1995-2005**



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

Compared to Arizona's rate, Blacks were 62.6 percent more likely to die from cerebrovascular disease in 2005 (**Figure 2B-7, Table 2B-4**). The 2005 mortality rate for cerebrovascular disease among American Indians (32.3/100,000) was the lowest among race/ethnic groups. American Indian males had the lowest mortality rate for cerebrovascular disease among gender by race subgroups (29.9 deaths per 100,000, **Figure 2B-4**), while Black or African American females had the highest rate of 94.1/100,000.

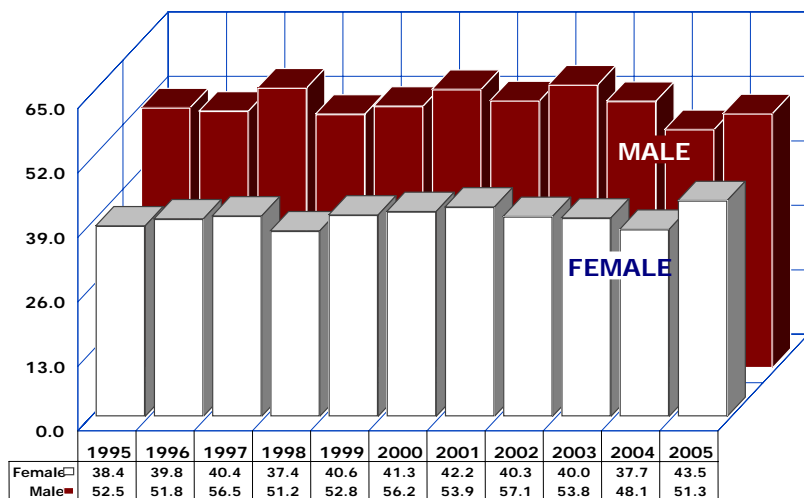
**Figure 2B-7**  
**Age-Adjusted Mortality Rates for Cerebrovascular Disease by Race/Ethnic Group, Arizona, 2005**



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

2B. LEADING CAUSES OF DEATH  
**Chronic lower respiratory diseases**

**Figure 2B-8**  
**Age-Adjusted Mortality Rates for Chronic Lower\* Respiratory Diseases by Gender and Year, Arizona, 1995-2005**

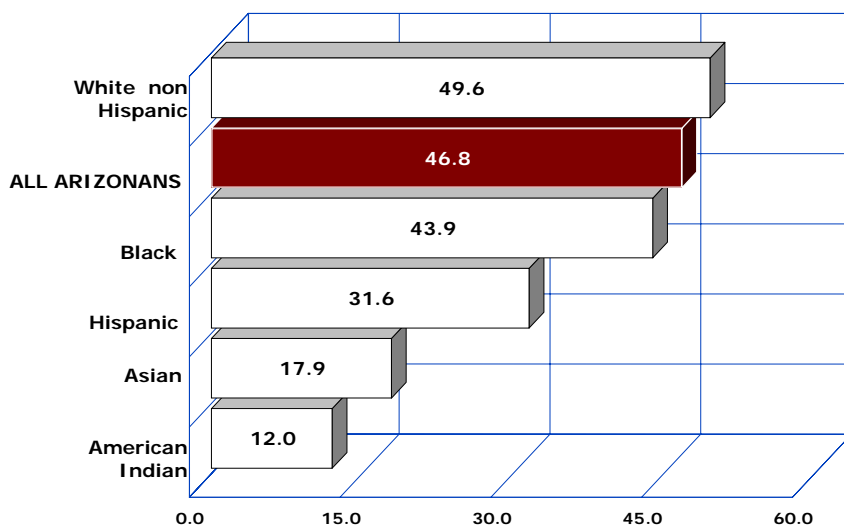


Number of deaths per 100,000 population age-adjusted to the 2000 U.S. standard.  
 \* This ICD-10 title corresponds to Chronic Obstructive Pulmonary Disease (ICD-9 title).

In 2005, chronic lower respiratory diseases (bronchitis, emphysema, asthma) were the 4<sup>th</sup> leading cause of death among Arizona residents (Table 2B-1). From 2004 to 2005, the mortality rates for chronic lower respiratory diseases (CLRD) increased for both genders (Figure 2B-8, Table 2B-2). The gender gap in CLRD mortality narrowed from 36.7 percent greater risk for males than females in 1995, to a 18.4 percent greater risk in 2005.

Rural females had the lowest mortality rate for CLRD (40.7/100,000) among the gender by region groups (Table 2B-5). Rural males, the group at the highest mortality risk for CLRD, were 39.1 percent more likely in 2005 to die from this cause than rural females.

**Figure 2B-9**  
**Age-Adjusted Mortality Rates for Chronic Lower Respiratory Diseases by Race/Ethnic Group, Arizona, 2005**



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

Death rates for emphysema, chronic bronchitis, asthma and other lower respiratory disorders were substantially higher among White non-Hispanics (49.6 deaths per 100,000) than they were among Blacks (43.9/100,000), Hispanics (31.6/100,000), Asians (17.9/100,000), and American Indians (12.0/1000; Figure 2B-9, Table 2B-4).







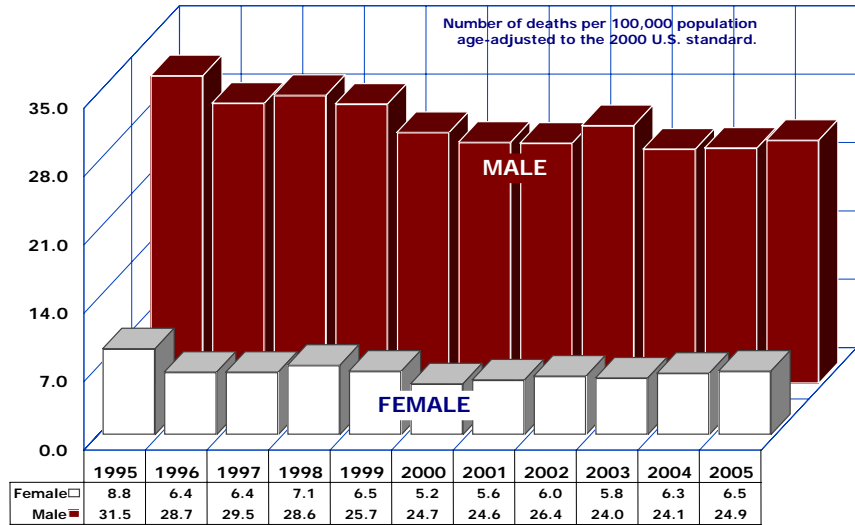


2B. LEADING CAUSES OF DEATH  
**Intentional self-harm (suicide)**

In 2005, suicide was the 8<sup>th</sup> leading cause of death among males. It was not ranked among the top ten causes of mortality for females. The age-adjusted suicide rate increased for females by 3.2 percent from 6.3 suicides per 100,000 in 2004 to 6.5 suicides per 100,000 in 2005. The 2005 male mortality risk for intentional self-harm (24.9/100,000) also increased by 3.3 percent from the 2004 rate of 24.1 suicides per 100,000 males.

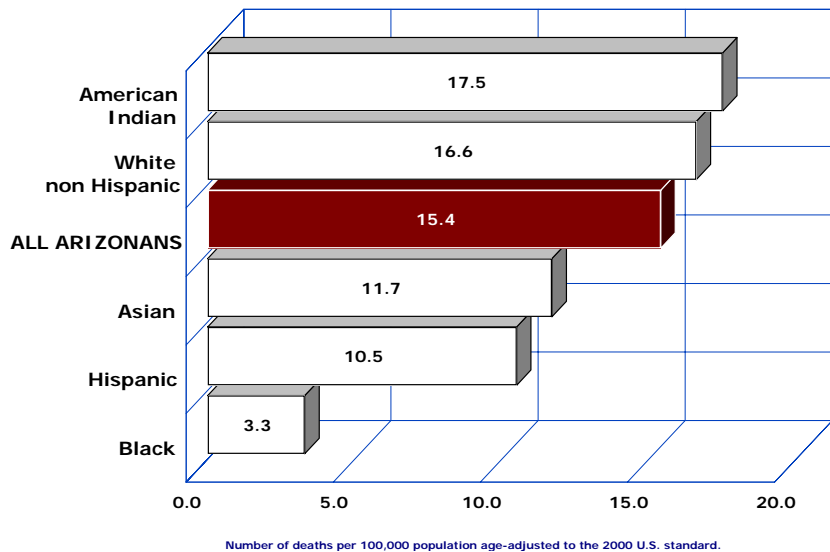
In 2005, suicide posed a 3.8 times greater mortality risk for males (24.9/100,000) than females (6.5/100,000).

**Figure 2B-18**  
**Age-Adjusted Mortality Rates for Suicide by Gender and Year, Arizona, 1995-2005**



Note: The suicide rates for 2001 were revised. For more details see *Intentional Self-Harm (suicide), Arizona, 1994-2004* at <http://www.azdhs.gov/plan/report/im/im04/3/index.htm>. See also footnote to Table 2B-1.

**Figure 2B-19**  
**Age-Adjusted Mortality Rates for Suicide by Race/Ethnic Group, Arizona, 2005**



Suicide rates in 2005 were substantially higher among American Indians and White non-Hispanics (17.5/100,000 and 16.6/100,000, respectively) than they were among Asians (11.7/100,000), Hispanics (10.5/100,000) and Blacks (3.3/100,000) (Figure 2B-19, Table 2B-4).

The age-adjusted mortality rates varied in Arizona in 2005 from 9.7 suicides per 100,000 residents of Graham County to 31.6 suicides per 100,000 residents of Gila County (Table 5E-11). There were no suicides in Greenlee County in 2005.



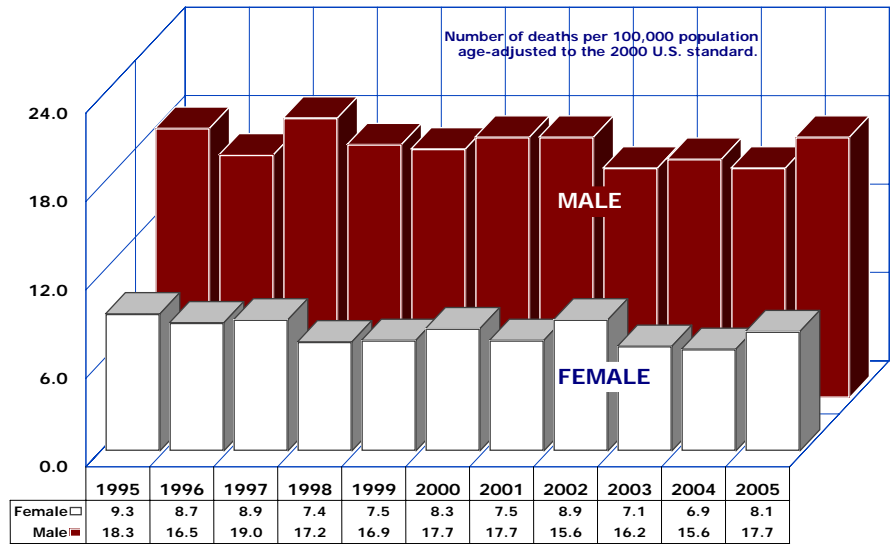
2B. LEADING CAUSES OF DEATH  
**Chronic liver disease and cirrhosis**

Chronic liver disease and cirrhosis was the 10<sup>th</sup> leading cause of death in Arizona in 2005 (**Figure 2B-1, Table 2B-1**). Among the 749 deaths due to chronic liver disease and cirrhosis, 498 (66.5 percent) were males.

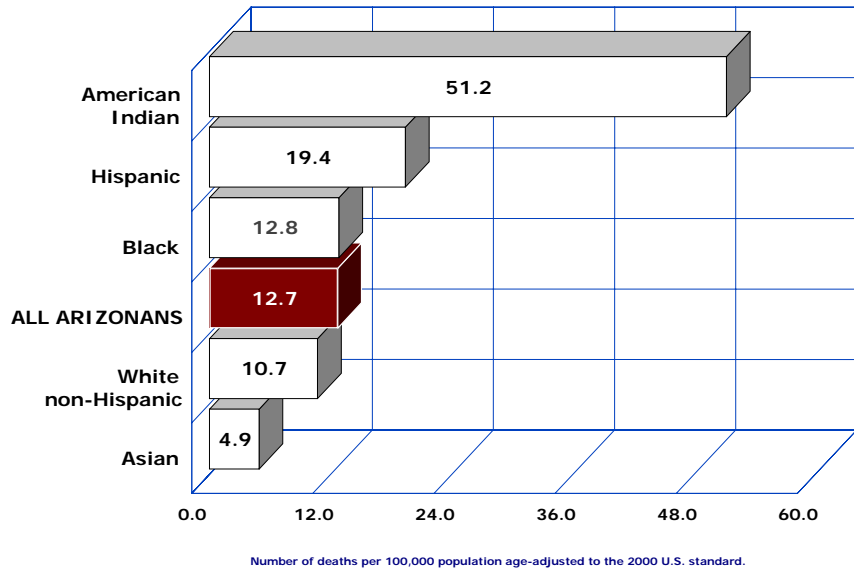
Arizona males were 2.2 times more likely to die in 2005 from chronic liver disease and cirrhosis than Arizona females (17.7 deaths per 100,000 vs. 8.1 deaths per 100,000) (**Figure 2B-22, Table 2B-2**).

In 2005, Greenlee, Navajo and Apache counties had the highest mortality rates for chronic liver disease and cirrhosis (**Table 5E-11**).

**Figure 2B-22**  
**Age-Adjusted Mortality Rates for Chronic Liver Disease and Cirrhosis by Gender and Year, Arizona, 1995-2005**



**Figure 2B-23**  
**Age-Adjusted Mortality Rates for Chronic Liver Disease and Cirrhosis by Race/Ethnic Group, Arizona, 2005**

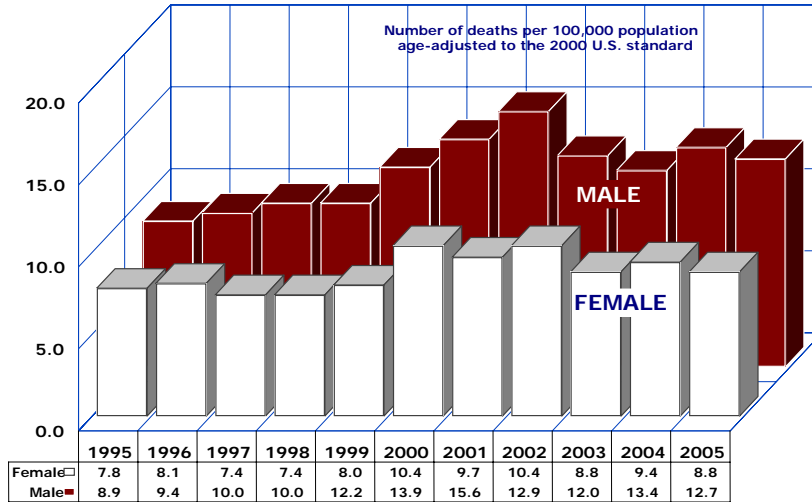


The 2005 death rate for chronic liver disease and cirrhosis among American Indians (51.2/100,000) was 10.4 times greater than the rate among Asians (4.9/100,000) (**Figure 2B-23, Table 2B-4**). The rate for Hispanics (19.4 deaths per 100,000 population) was the second highest among racial/ethnic groups in the State.

Compared to the median age at death from all causes (77.0 years), those who died from chronic liver disease and cirrhosis were 19.4 years younger (57.6 years, **Table 2D-3**).

2B. LEADING CAUSES OF DEATH  
**Nephritis, nephrotic syndrome and nephrosis**

**Figure 2B-24**  
**Age-Adjusted Mortality Rates for Nephritis, Nephrotic Syndrome and Nephrosis by Gender and Year, Arizona, 1995-2005**



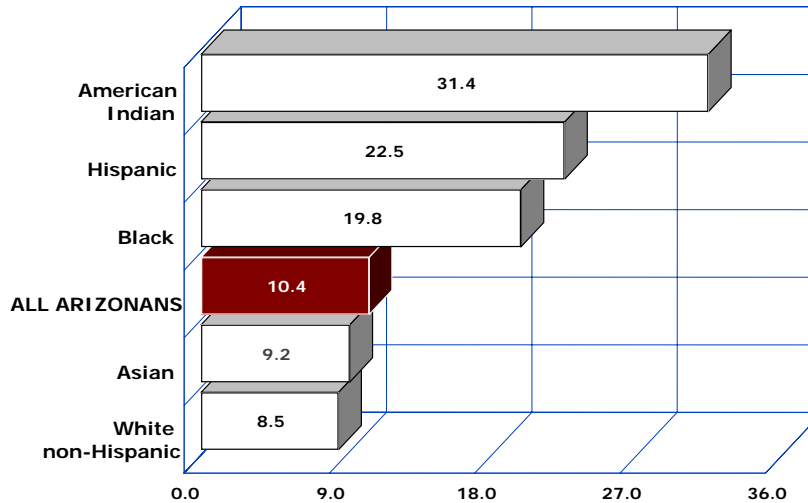
Note: The rates for 1995-1999 are comparability-modified.

Kidney disease (nephritis, nephrotic syndrome and nephrosis) was the 11<sup>th</sup> leading cause of death in Arizona in 2005 (**Figure 2B-1**). Kidney disease ranked ninth for females, but it was not ranked among the 10 leading causes for males.

The male mortality rate for kidney disease decreased by 5.2 percent from 13.4/100,000 in 2004 to 12.7/100,000 in 2005 (**Figure 2B-24**). The female mortality rate also decreased by 6.4 percent from 9.4/100,000 in 2004 to 8.8/100,000 in 2005.

In 2005, nephritis, nephritic syndrome and nephrosis was mentioned on 2,687 death certificates but it was selected as the underlying cause for only a minority of 603 deaths (**Figure 2B-1**)

**Figure 2B-25**  
**Age-Adjusted Mortality Rates for Nephritis, Nephrotic Syndrome and Nephrosis by Race/Ethnic Group, Arizona, 2005**



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

The 2005 nephritis death rates were substantially higher among American Indian (31.4 deaths per 100,000), Hispanic (22.5 per 100,000), and Black (19.8 per 100,000) residents of the State compared to nephritis rates among Asians (9.2/100,000) and White non-Hispanics (8.5/100,000) (**Figure 2B-25, Table 2B-4**).

American Indian females had the highest mortality rate (34.6/100,000) for nephritis, nephrotic syndrome and nephrosis among the gender by race groups (**Table 2B-4**).