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:

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</thead>
<tbody>
<tr>
<td>AZ residents</td>
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<tr>
<td>Reported out-of-State deaths</td>
<td>1,608</td>
<td>1,431</td>
<td>1,569</td>
<td>792</td>
<td>844</td>
<td>1,009</td>
<td>678</td>
<td>640</td>
<td>714</td>
<td>553</td>
</tr>
</tbody>
</table>

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:

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<td>AZ residents</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Missing cause of death</td>
<td>16</td>
<td>30</td>
<td>12</td>
<td>11</td>
<td>197</td>
<td>970</td>
<td>704</td>
<td>532</td>
<td>118</td>
<td>37</td>
</tr>
</tbody>
</table>

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:

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

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.
The leading underlying cause of death to Arizona residents in 2005 continued to be heart disease, which accounted for 10,779 or 23.9 percent of all deaths (Figure 2B-1, Table 2B-1, Table 5E-14). Cancer remained the second most frequent cause of death to residents of the state, being responsible for 21.4 percent of all deaths in 2005. Deaths due to accidents (unintentional injuries) ranked third in 2005, with 3,006 resident deaths reported. The fourth leading cause of death, chronic lower respiratory diseases (a title change from ICD-9 title chronic obstructive pulmonary disease) accounted for 2,778 or 6.2 percent of total deaths. Deaths due to cerebrovascular disease ranked fifth in 2005, with 2,325 resident deaths reported. In 2005, cerebrovascular disease accounted for 5.2 percent of all deaths. Together, these five causes accounted for 63.3 percent of total deaths in 2005.

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 10,779 deaths that had diseases of the heart assigned as the underlying cause, another 5,646 deaths had diseases of the heart assigned as the other than underlying cause. The sum of these two counts (16,425, Figure 2B-1) is the total number of deaths that had any mention of diseases of the heart on the 2005 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 15th as the underlying cause but ranked 6th when any mention of it is counted.
Some causes are selected as the underlying cause of death more often than others, relative to the number of deaths for which they are reported on the death certificate. The majority of deaths due to heart disease (65.6 percent) were assigned as an underlying cause. Heart disease continued to be the top cause of death for both males and females. In 2005, among the 10,779 deaths from heart disease, 5,789 were male (53.7 percent) and 4,990 were female (Table 2B-4) Both females and males experienced declines in heart disease mortality rates from 1995 to 2005. The rate for females declined by 20.8 percent from 185.9 in 1995 to 147.3 in 2005. Among males, the age-adjusted death rate for heart disease first declined by 15.5 percent from 1995 to 1998 (Figure 2B-2). The rate then increased for two consecutive years. It has declined again by 9.7 percent from 2000 to 2004. The 2005 male mortality risk of death from heart disease (237.4/100,000) exceeded the female risk (147.3/100,000) by 61.2 percent (Figure 2B-2, Table 2B-2).

Black residents of Arizona were 1.6 times more likely to die from diseases of heart in 2005 than Asians who were at the lowest risk of death from diseases of the heart among race/ethnic groups in the State (Figure 2B-3, Table 2B-4).

However, the age adjusted mortality rates for diseases of the heart among Blacks or African Americans continued a downward trend observed since 1980. The risk of death from diseases of heart for Black Arizonans was 36.2 percent lower in 2005 than in 1980. The largest decrease reported of 49.1 percent occurred among Black males, followed by White non-Hispanic females (-44.7 percent), and Hispanic males (-38.7 percent; based on rates in Table 2B-3).
2B. LEADING CAUSES OF DEATH

Malignant neoplasms

Cancer ranked as the 2nd 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).

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).
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).

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.
2B. LEADING CAUSES OF DEATH

Chronic lower respiratory diseases

In 2005, chronic lower respiratory diseases (bronchitis, emphysema, asthma) were the 4th 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.

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).
The number of deaths from unintentional injuries in accidents increased by 52.4 percent from 1,973 in 1995 to 3,006 in 2005 (Table 2B-1). In 2005, accidents ranked third leading cause of death for males and seventh for females. The mortality rate for unintentional injuries in accidents increased by 8.5 percent among Arizona females from 31.7 deaths per 100,000 in 2004 to 34.4 in 2005 (Figure 2B-10). The mortality rate increased by 12.4 percent for males from 61.1/100,000 in 2004 to 68.7/100,000 in 2005. For both females and males, the 2005 mortality rates for unintentional injuries were the highest of the 1995 to 2005 period (Figure 2B-10, Table 2B-2).

The American Indian death rate for unintentional injuries (117.8/100,000) was 3.4 times higher than the rate for Asians (34.2/100,000), the group at the lowest risk of unintentional injury death among race/ethnic groups in the State (Figure 2B-11, Table 2B-4).

In 2005, Apache (129.3/100,000) and Navajo (98.2/100,000) counties had the two highest age-adjusted mortality rates for unintentional injuries (Table 5E-11).
2B. LEADING CAUSES OF DEATH

Influenza and pneumonia

In 2005, influenza and pneumonia ranked 7th leading cause of death for both males and females. Among the 1,280 deaths, influenza was identified as the underlying cause for 33 of them, while pneumonia was listed as the underlying cause on 1,247 death certificates.

The mortality rate for influenza and pneumonia increased for females from 16.3 deaths per 100,000 in 2004 to 19.2 deaths in 2005 (Figure 2B-12, Table 2B-2). The mortality rate for influenza and pneumonia also increased for males from 25.7 deaths per 100,000 in 2004 to 26.6/100,000 in 2005.

In 2005, Arizona males were 38.5 percent more likely to die from influenza and pneumonia than females.

The highest among ethnic groups mortality rates from influenza and pneumonia in 2005 were those of American Indians (72.0/100,000) compared to 26.5/100,000 among Hispanics, 21.6/100,000 among Blacks, 20.5/100,000 among White non-Hispanics, and 17.5/100,000 among Asians (Figure 2B-13, Table 2B-4).

Compared to the state death rate for influenza and pneumonia, Apache’s County rate was 3.2 times greater (72.3/100,000), and Navajo’s County 2.6 times greater (57.5/100,000; Table 5E-11).
Based on the number of deaths in 2005, Alzheimer’s disease was the 5th leading cause of death for females and 6th leading cause for males (Table 2B-4).

The age-adjusted mortality rate for Alzheimer’s disease among females increased by 4.4 percent from 34.2/100,000 in 2004 to 35.7/100,000 in 2005 (Figure 2B-14). Among males, the age-adjusted mortality rate for Alzheimer’s disease also increased by 4.9 percent during that time.

The age-adjusted death rate for Alzheimer’s disease was 28.9 percent higher in 2005 for females than for males.

The age-adjusted mortality rates for Alzheimer’s disease in 2005 were higher among Black (42.7 deaths per 100,000) and White non-Hispanic (33.0 deaths per 100,000) residents of Arizona than they were among Hispanics (31.3/100,000), Asians (30.2/100,000) and American Indians (16.2/100,000) (Figure 2B-15, Table 2B-4).

White non-Hispanic residents of Arizona disproportionately contributed to mortality from Alzheimer’s disease. In 2005, White non-Hispanics accounted for 64.9 percent (Table 10C-1) of the State’s population, but 90.2 percent of all deaths from Alzheimer’s disease (1,638 out of 1,816; Table 2B-4).

In 2005, the median age at death from Alzheimer’s disease was 88.1 years of age for females and 85.2 years for males (Table 2D-3).
In 2005, diabetes was the 8th leading cause of death among Arizona residents. The temporal changes from 2004 to 2005 in mortality from diabetes differed for the two genders, increasing by 5.6 percent for males and decreasing by 9.2 percent for females (Figure 2B-16).

In 2005, in addition to 1,196 deaths that had diabetes assigned as the underlying cause, another 1,740 deaths had diabetes assigned as a contributing factor. The diabetes-related death rate of 49.1/100,000 (Table 6A-6) was 2.4 times greater than the rate for diabetes as underlying cause (20.1/100,000, 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.

The age-adjusted mortality rate for diabetes among American Indians (69.9 deaths per 100,000) was 4.5 times higher than the rate of 15.5 deaths per 100,000 for White non-Hispanics (Figure 2B-17, Table 2B-4). The latter was the lowest rate among race/ethnic groups in the State.

Among the 15 Arizona counties in 2005, Apache (51.4/100,000) and Santa Cruz (48.7/100,000) counties had the highest mortality rates for diabetes (Table 5E-11).
2B. LEADING CAUSES OF DEATH

Intentional self-harm (suicide)

In 2005, suicide was the 8th 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).

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

Assault (homicide)

In 2005, assault (homicide) was the 12th leading cause of death in the State (Table 2B-1). The number of 503 Arizonans who were murdered in 2005 was the second highest of the 1995-2005 period (Table 2B-1).

However, the homicide rate declined by 10.3 percent for females from 2.9/100,000 in 2004 to 2.6/100,000 in 2005. In contrast, the homicide rate increased by 1.5 percent for males from 13.3 deaths per 100,000 in 2004 to 13.5 deaths per 100,000 in 2005. (Table 2B-2 Figure 2B-20).

The 2005 homicide rates were substantially higher among Black, Hispanic and American Indian residents of the State compared to homicide rates among White non-Hispanics and Asians. Blacks were 5.4 times more likely, while Hispanics 1.9 times and American Indians 2.0 times more likely to die from assault than Asians (Figure 2B-21, Table 2B-4).

Among the 15 counties in 2005, Gila, Apache and Pinal counties had the three highest homicide death rates, while there were no homicides among residents of Greenlee, Santa Cruz and La Paz counties (Table 5E-11).
2B. LEADING CAUSES OF DEATH

Chronic liver disease and cirrhosis

Chronic liver disease and cirrhosis was the 10th 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).

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).
Nephritis, nephrotic syndrome and nephrosis

Kidney disease (nephritis, nephrotic syndrome and nephrosis) was the 11th 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).

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).