



# **INJURIES AND DEATHS OF ARIZONA RESIDENTS IN MOTOR VEHICLE ACCIDENTS**



**Public Health Services  
Bureau of Public Health Statistics  
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# **INJURIES AND DEATHS OF ARIZONA RESIDENTS IN MOTOR VEHICLE ACCIDENTS**

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by

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## **INTRODUCTION**

The 1988 edition of the "Arizona Health Status and Vital Statistics" annual report included a special section on "Victims of Motor Vehicle Accidents and Their Injuries".\* The inclusion, as of January 1989, of International Classification of Diseases codes describing external causes of injury (E-codes) in the Hospital Charges Reporting System mandated by A.R.S. 36-125.06A made this exploratory study possible. In the almost 20 years since the publication of this report there was no attempt to update its findings.

## **PURPOSE**

This study, like the original one, has several purposes. The first is to diagram the array of outcomes from vehicular events involving an injury and to indicate what outcomes have descriptive data available. The second is to more fully describe the fatalities from 1993 to 2007. Specifically, who were the victims of these fatal vehicular accidents, e.g. drivers, occupants or pedestrians, and what were some of their demographic characteristics such as age, gender, and race/ethnicity.

The third purpose is to explore injury morbidity in order to demonstrate the larger magnitude of the motor vehicle injury problem. This exploration involves a description of actual injuries and consequences suffered by victims of vehicular events who either visited an emergency room or were treated as inpatients in the non-federal hospitals in Arizona.

Beginning with the 2000 data year in Arizona (1999 nationally), 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. Another purpose of our report was to identify the breaks in comparability of mortality statistics effective with deaths occurring in 2000 as a 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. 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 using computerized procedures of SuperMICAR (Mortality Medical Indexing and Retrieval) and ACME (Automated Classification of Medical Entities) systems.

Last but not least, an update of an Arizona-specific study of victims and outcomes of motor vehicle accidents has been long overdue.

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Joanne C. Gersten and Christopher K. Mrela: *Arizona Health Status and Vital Statistics 1988*. Arizona Department of Health Services, Office of Planning and Health Status Monitoring: January 1990.

The special section on "Victims of Motor Vehicle Accidents and Their Injuries" is on pp. 70 – 84.

## METHODS AND SOURCES

Three data sources are utilized in this publication: the death certificate database, the hospital discharge database, and the population denominator databases.

The death certificate database contains demographic characteristics of the deceased (age, gender, race/ethnicity, marital status, educational attainment), and cause of death. 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. Since 2000, the causes of death are classified by the Tenth Revision of the International Classification of Diseases (ICD-10), replacing the Ninth Revision used during 1979-1999.

The hospital discharge database contains two types of records: inpatient hospitalizations and emergency room visits. An inpatient discharge occurs when a person who was admitted to a hospital leaves that hospital. A person who has been hospitalized more than once in a given calendar year will be counted multiple times as a discharge and included more than once in the hospital inpatient discharge data set; thus, the numbers we report here are for discharges, not persons. Up to nine diagnoses are coded for each discharge. Diagnostic groupings and code numbers are based on the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM). Information about the patient's race/ethnicity is available only for inpatient hospitalizations but not for emergency room visits. The "E" code classification is used to describe both the *mechanism* of injury (e.g. motor vehicle traffic, fall, poisoning), but also the manner or *intent* of the injury (e.g. self-inflicted, assault, accident). In 2007, approximately one in six inpatient hospitalizations for injury (and one in five emergency room visits) did not have an external cause code.

Beginning with the 2000 data year, 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. 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.

Age-adjustment is important for any comparative analysis of mortality risks associated with a motor vehicle-related injury because both the risk of death and the risk of being in a motor vehicle accident vary by age. The rates for 1993-1999 were recomputed for the new population standard so that mortality rates can be compared over time. Population denominators for Arizona residents, used to calculate the age-adjusted mortality rates for 1993 - 1999, are "Bridged-Race Intercensal Population Estimates for July 1, 1990 - July 1, 1999", available from the National Center for Health Statistics (NCHS: <http://www.cdc.gov/nchs/about/major/dvs/popbridge/datadoc.htm>). The year 2000 mortality rates are based on census enumerations. Several data sources were utilized in producing the 2001 - 2007 population estimates. Detailed information is available at <http://www.azdhs.gov/plan/menu/info/pd.htm> .

The average-annual mortality rates by single year of age, gender, and race/ethnicity for 1993 - 2007 were computed using the year 2000 Census enumerations (population at mid-point) multiplied by fifteen



## OUTCOMES OF MOTOR VEHICLE ACCIDENTS

**Figure A** diagrams the possible outcomes to people injured in an event involving an automobile, truck, bus or other motor vehicle. Death certificates describe fatal outcomes (row F in diagram) to Arizona residents irrespective of where they occur. Death at the scene of the motor vehicle accident or during transit to hospital is not identified on the death certificate. Place of death is more likely to be specified if the fatal outcome occurs within the framework of institutionalized health care, i.e., on arrival to a facility, in emergency treatment or after admission to either hospital or other health care facility. However, approximately one-half of death certificates give place of death as "other" (in 2007, the category "other" was used on 538 out of 1,035 death certificates where the underlying cause of deaths was classified as motor vehicle accident: <http://www.azdhs.gov/plan/report/ahs/ahs2007/pdf/2b11.pdf> ). Also, injury death coding gives precedence to the external cause, e.g. driver of motor vehicle, vehicular collision with pedestrian, rather than part of body harmed, so death certificate data on type of bodily trauma are limited.

Injured persons still alive at the scene of a vehicular event may require transport for health care attention or may walk away because the injury is correctly or incorrectly perceived as minor. Data are not available for either the number of injured persons who walk away or the earlier injured walk-aways who recycle for care from a private physician or – prior to 2004 – an emergency room (**Figure A**).

Data on injuries again become available when people are treated in an emergency room or admitted to inpatient care, with information on external cause of injury, type of bodily trauma, and charges for the health services provided. Starting from the pool of inpatients injured in a motor vehicle event, the proportion who die (row F), are discharged to home or self care (row C), or are discharged to another health care facility (row E) can be described.

Data on chronic impairment (row B), staying in good health (row A) and recycling into the health care system for late effects of the original motor vehicle accident are not available after persons are discharged from the hospital to other health care institutions (row E) or to home/self care (row C).

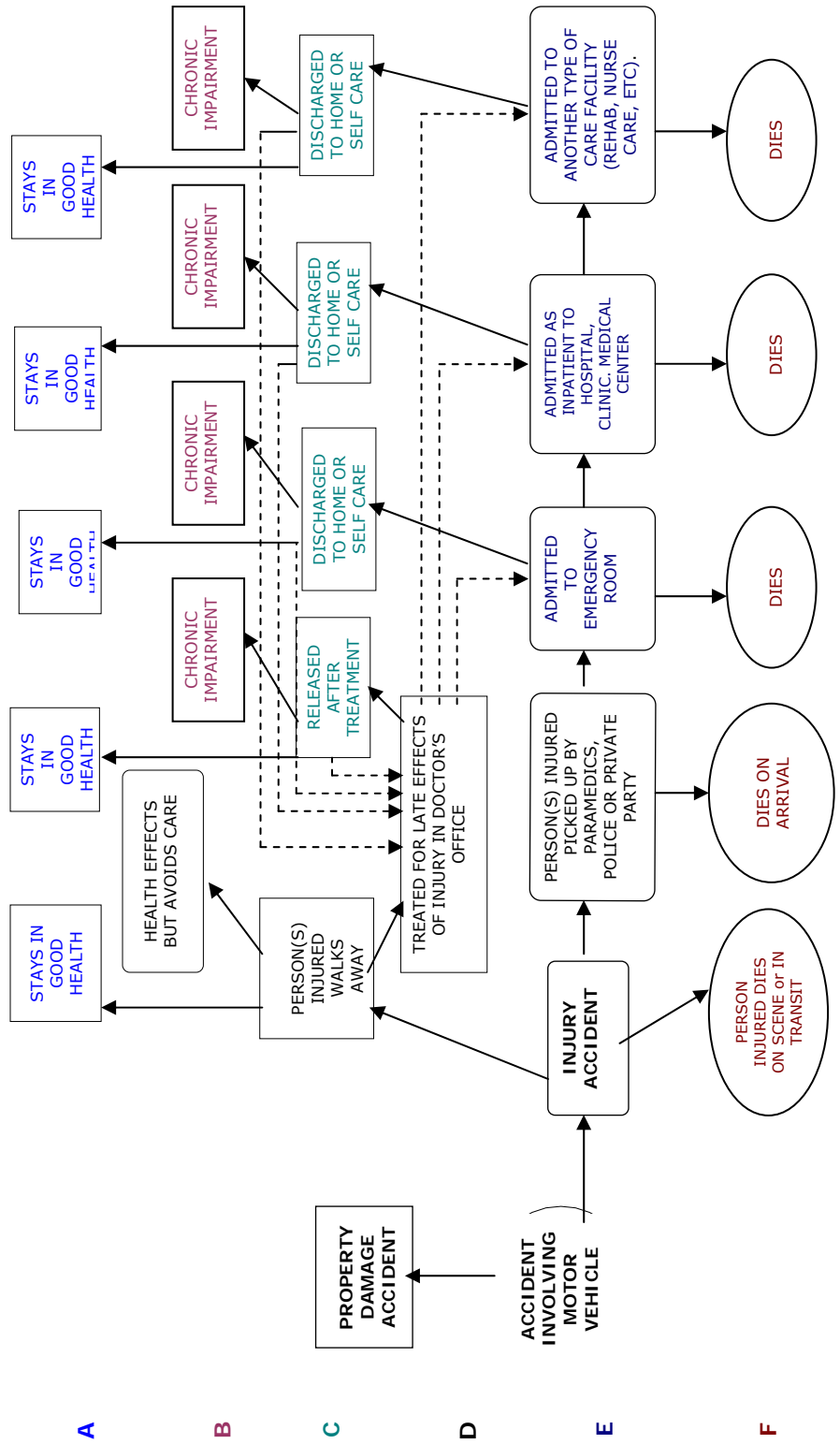


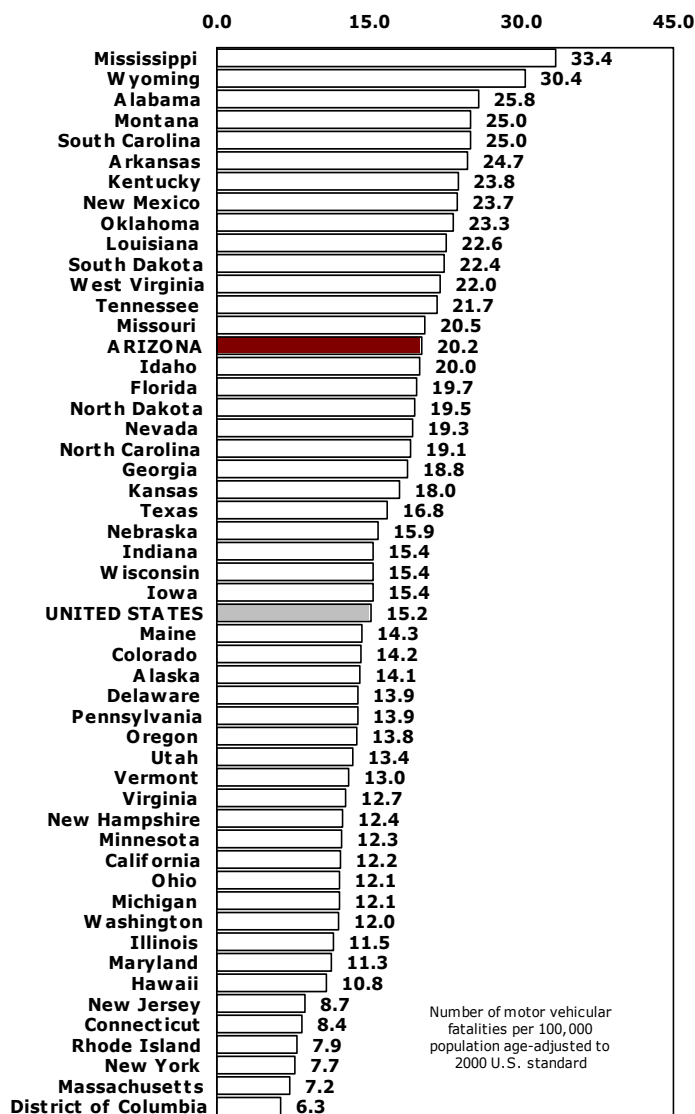
Figure A. Possible Outcomes of Motor Vehicle-Related Injuries

## COMPARISON OF THE AGE-ADJUSTED MORTALITY RATES FOR MOTOR VEHICLE-RELATED INJURIES BY STATE

In 2005, the age-adjusted rates of mortality from unintentional injuries related to motor vehicles ranged from 6.3 deaths per 100,000 residents in the District of Columbia (**Figure B**) to 33.4/100,000 in Mississippi. Arizona had the 15<sup>th</sup> highest motor vehicle accident death rate among the 50 states and the District of Columbia. Twenty years earlier, in 1985, Arizona ranked 10<sup>th</sup> highest nationally.

Injuries as a result of motor vehicle accidents have killed Arizonans at a rate 33 percent greater than the national rate of 15.2 deaths per 100,000 population in 2005.

**Figure B**  
**Age-Adjusted Mortality Rates for Motor Vehicle-Related Injuries by State in 2005\***



\*The latest available year. All age-adjusted mortality rates by state discussed in this section are from the Web-based Injury Statistics Query and Reporting System (WISQARS), available online at <http://www.cdc.gov/ncipc/wisqars/>. The 2005 rate for Arizona computed using the WISQARS site is higher than the age-adjusted rate of 18.9 in our publications (see Table 1-1). The rates differ because both the numerators and the denominators are different. Briefly, WISQARS uses the National Center for Health Statistics (NCHS) death data from all registration areas. Unlike our mortality database, the NCHS data collected by the state of occurrence include all out-of-state deaths of Arizona residents in motor vehicle accidents and from other causes. On the other hand, the annual population estimates for Arizona from the U. S. Census Bureau have been historically lower than the estimates developed locally under the auspices of the Population Technical Advisory Committee. To conclude, the rates computed on WISQARS site are based on more motor vehicle-related deaths (1,200 vs. 1,137) and a smaller estimated population (5,952,083 vs. 6,044,985).

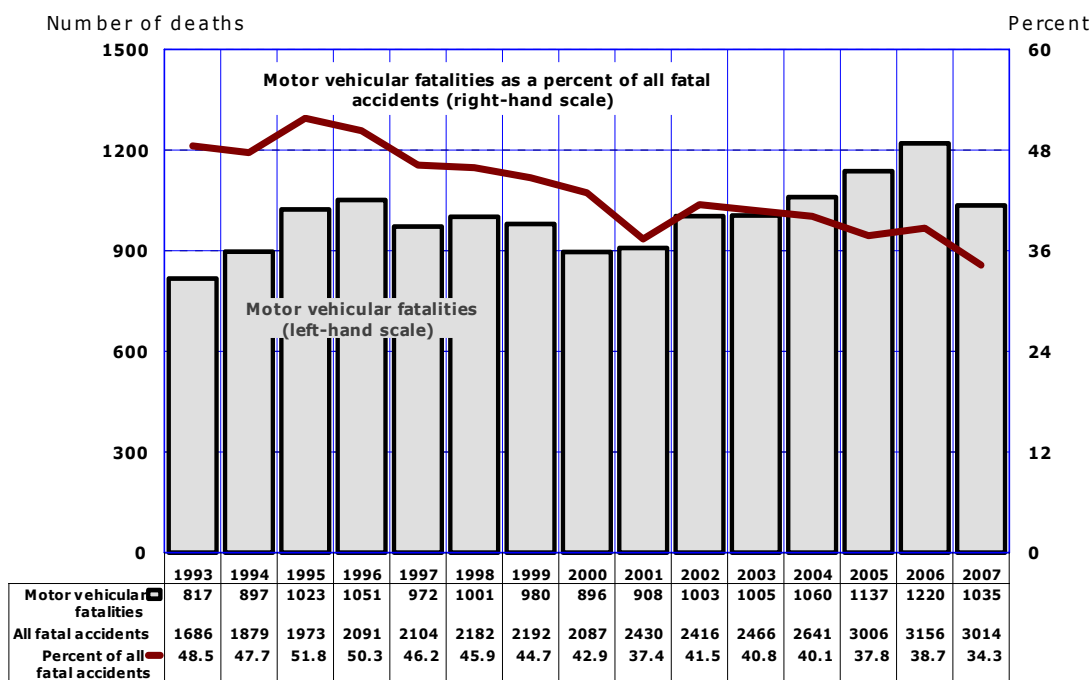
## CHANGES IN THE PROPORTIONAL CONTRIBUTION OF FATAL VEHICULAR ACCIDENTS TO ALL UNINTENTIONAL INJURY DEATHS

Motor vehicle-related injuries continue to be the leading cause of unintentional injury deaths both nationally and in Arizona. From 1993 to 2007, 15,005 Arizonans were fatally injured in a motor vehicle accident for an average annual count of 1,000 deaths per year. Excessive annual death rates meant that almost 4,000 Arizonans died who would not have died if they had the same mortality odds as their U.S. counterparts. From 1993 to 2007, Arizona males accounted for 2.2 times more motor vehicle fatalities than did females (10,277 and 4,728 respectively).

However, the proportional contribution of fatal vehicular accidents to all unintentional injury deaths has been gradually declining in Arizona. In 1995, motor vehicle accidents accounted for 51.8 percent of all fatal accidents (Figure C), compared to 34.3 percent in 2007.

The decline in the proportional contribution of motor vehicle accidents to all unintentional injury deaths cannot be attributed to the decrease in the number of fatal vehicular accidents. Rather, it can be ascribed to the increasing incidence of fall injuries and drug overdoses. The number of fatal drug overdoses increased 4.4 times from 153 in 1993 to 669 in 2007. The number of deaths from fall injuries increased 2.9 times from 248 in 1993 to 720 in 2007. In 2007, fall injuries and drug overdoses accounted for a combined 46.1 percent of unintentional injury deaths in the State.

**Figure C**  
**Number of Motor Vehicular Fatalities and Motor Vehicular Fatalities as a Percent of all Fatal Accidents by Year, Arizona Residents, 1993-2007**



## DATA ORGANIZATION

The charts and tables comprising *Injuries and Deaths of Arizona Residents in Motor Vehicle Accidents* are organized into seven major sections:

1. Trends in Age-Adjusted Mortality Rates for Motor Vehicle-Related Injuries by Gender and Race/Ethnicity, Arizona Residents, 1993-2007
2. Patterns in Mortality from Motor Vehicle-Related Injuries by Single-Year of Age, Gender and Race Ethnicity, Arizona Residents, 1993-2007
3. Characteristics of Persons Fatally Injured by Motor Vehicles, Arizona Residents, 1993-2007
4. Emergency Room Visits and Inpatient Discharges with Motor Vehicle-Related Injury Diagnosis by Type of Injured Person, Arizona Residents, 2005-2007
5. Types of Injuries and Types of Injured Persons among Emergency Room Visits and Inpatient Discharges with Motor Vehicle-Related Injury Diagnosis, Arizona Residents, 2005-2007
6. Probability of Various Outcomes for Inpatient Discharges and Emergency Room Visits with Motor Vehicle-Related Injury Diagnosis by Type of Injury and Type of Injured Person, Arizona Residents, 2005-2007
7. Hospital Charges Incurred by Patients with Motor Vehicle-Related Injury Diagnosis by Type of Injured Person and Type of Injury, Arizona Residents, 2005-2007

## SUMMARY OF FINDINGS

✓ **From 1993 to 2007, 15,005 Arizonans were fatally injured in a motor vehicle accident for an average annual count of 1,000 deaths per year.**

✓ **Excessive annual death rates meant that almost 4,000 Arizonans died who would not have died if they had the same mortality odds as their U.S. counterparts.**

✓ **The mortality rate for motor vehicle-related injuries declined by 29.9 percent from a recent peak of 23.1 deaths per 100,000 age-adjusted population in 1995 to 16.2/100,000 in 2007. Both males and females had nearly equal reductions in the death rate for motor vehicle-related injuries.**

✓ **From 1993 to 2007 males were 2.2 times more likely than females to be motor vehicle fatalities.**

✓ **In 1993-2007, the distribution of mortality rates for motor vehicle accidents was bimodal, reaching the first peak at age 21 (40.1 deaths per 100,000 persons), tapering off, and then rising to a second peak at age 84 (40.2 deaths per 100,000 persons). Interestingly, 21 year olds shared the mortality risk in motor vehicle accidents with persons exactly 4 times their age.**

✓ **While no specific age confers immunity from injuries and/or deaths in motor vehicle accidents, reaching the legal age to become a licensed driver of a motor vehicle, dramatically increases the mortality risk for both males and females.**

✓ **In 1993-2007, compared to a male mortality rate of 13.4/100,000 at age 14, the mortality rate at age 18 was 3.9 times greater (52.3/100,000), and 4.3 times greater at age 21 (58.2/100,000). The magnitude of the increase in the mortality was not quite as steep among females. Compared to a female mortality rate in motor vehicle accidents of 8.4/100,000 at 14, the mortality rate was 2.2 times as high at age 16 (18.7/100,000), and 2.8 times greater at age 18 (23.9/100,000).**

✓ Adolescents and young adults 15-24 years old were the age group with the second highest death rate from motor vehicle accidents in every year observed (in 1993-2007, Arizonans 85 years old and older had the highest mortality rate among the age groups).

✓ The mortality rate for motor vehicle-related injuries among adolescents and young adults 15-24 years old declined by 31.4 percent from a recent peak of 40.7/100,000 in 1995 to 27.9/100,000 in 2007.

✓ Beginning in 2000 the mode of transport has been unknown for the majority of the motor vehicle fatalities. It is an unintended result of the implementation of the Tenth Revision of the International Classification of Diseases. Unfortunately, it is not possible to design an effective prevention strategy without taking into consideration characteristics of victims of motor vehicle accidents. Air bags and seat belts are known to decrease the number of serious injuries and fatalities among the occupants of motor vehicles, but they do nothing for persons outside of vehicles. Similarly, wearing a helmet may work well for a motorcycle rider but it's unlikely to help a pedestrian.

✓ From January 1, 2005 to December 31, 2007, 151,196 Arizona residents were treated in the emergency rooms (ER) because of motor vehicle-related injuries; additionally, 22,608 persons were admitted as inpatients to non-federal, short-stay hospitals.

✓ In 2005-2007, among those who were treated in emergency rooms (ER) drivers were most prevalent at 52.2 percent, followed by occupants at 25.5 percent, motorcycle riders at 8.8 percent, pedestrians at 3.7 percent, and pedal cyclists at 2.1 percent

✓ Three hundred of the ER injury patients died during the treatment for a case-fatality rate of 0.2 percent. Pedestrians' case fatality rate was the highest (1.2 percent), followed by motorcycle riders (0.4 percent), and pedal cyclists (0.3 percent).

✓ Among the 22,608 Arizonans who survived long enough to become inpatients, 534 died during their hospital stay for a case fatality of 2.4 percent. Again, pedestrians' case fatality rate was the highest (4.9 percent), followed by pedal cyclists (3.2 percent). Pedestrians also were more likely than any other victim category to require aftercare (25.9 percent).

✓ The average length of stay for inpatients with motor vehicle-related injury diagnosis was 5.2 days. Average lengths of stay in the hospital varied by the five major victim types. Pedestrians, followed by motorcycle riders had the highest average length of stay (6.8 days and 5.4 days, respectively). Non-driving occupants of motor vehicles had the shortest average stay (4.6 days).

✓ In 2007, total charges incurred by ER patients with a motor vehicle-related injury diagnosis exceeded \$150 million (\$156,230,596).

✓ Patients who had injury to blood vessels had the highest average ER charges (\$19,956). Pedestrians, followed by motorcycle riders, and pedal cyclists had the highest average ER charges (\$3,369, \$3,297, and \$3,201, respectively).

✓ In 2007, the total hospital bill for the injured inpatients was more than \$450 million (\$452,433,771).

✓ Inpatients who had burns had the highest average inpatients charges (\$204,658). Pedestrians, followed by motorcycle riders, had the highest average hospital charges (\$72,949 and \$60,230).

**1.  
TRENDS IN AGE-ADJUSTED MORTALITY RATES  
FOR MOTOR VEHICLE-RELATED INJURIES  
BY GENDER AND RACE/ETHNICITY,  
ARIZONA RESIDENTS,  
1993-2007**

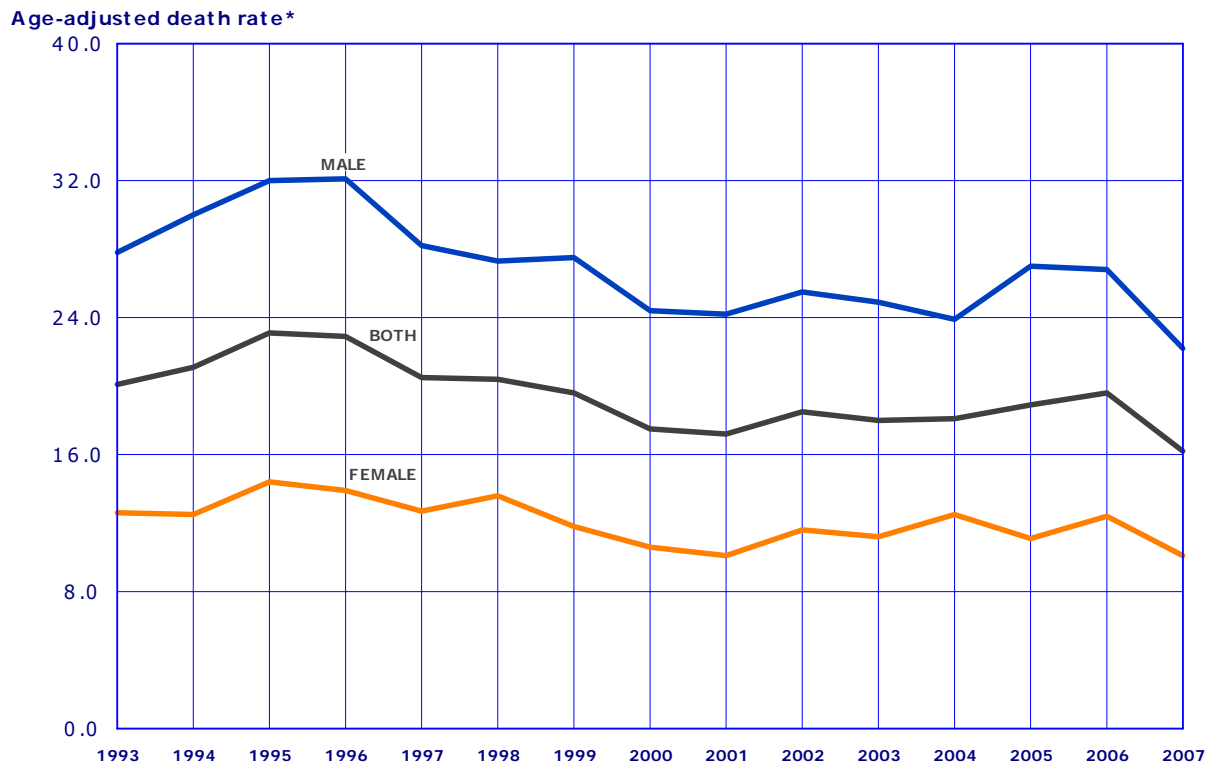




Age-adjustment of death rates controls for differences in the age composition of populations between time periods or between regions, genders, race/ethnic groups or other relevant demographic variables. The adjustment process makes age-adjusted mortality rates better indicators than crude death rates of temporal changes and differences among diverse populations or subgroups of the population. All mortality rates in this section are age-adjusted, using the 2000 standard population. Therefore, the reader should understand that the term age-adjusted precedes the word, mortality rate, even though it was eliminated from the text to make reading easier.

The mortality rate for motor vehicle-related injuries declined by 29.9 percent from a recent peak of 23.1 deaths per 100,000 age-adjusted population in 1995 to 16.2/100,000 in 2007 (**Figure 1-1**). Both males and females had nearly equal reductions in the death rates for motor vehicle-related injuries. However, each year from 1993 to 2007 males were more likely than females to be motor vehicle fatalities. In 2007, the male to female rate ratio was 2.2 (or the male mortality rate was 2.2 times greater than the rate for females). The disproportionality of males relative to females remained fairly stable in 1993 – 2007.

**Figure 1-1**  
**Age-Adjusted Mortality Rates\* for Motor Vehicle-Related Injuries by Gender and Year, Arizona Residents, 1993-2007**

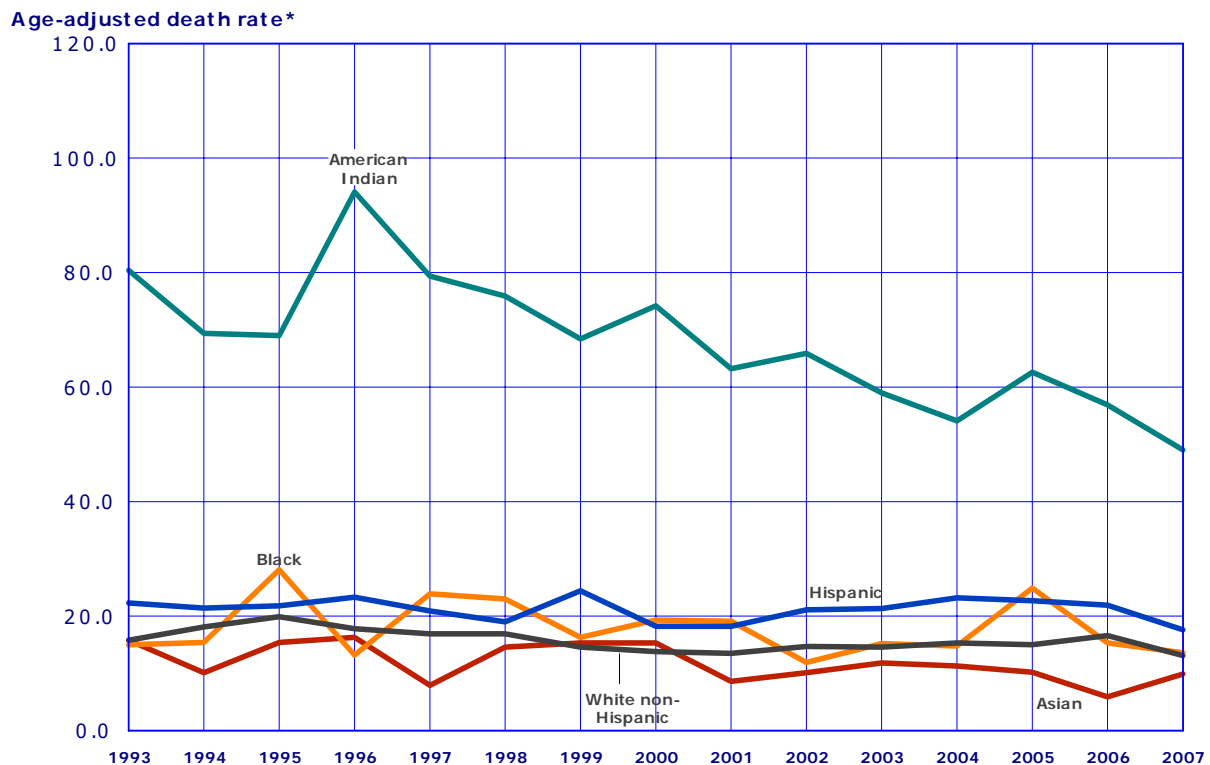


In 2007, the mortality rates for motor vehicle-related injuries ranged from 9.9 deaths per 100,000 Asian or Pacific Islander residents of the State to 49.0/100,000 among American Indians (**Figure 1-2**). In 1993 – 2007, the mortality rates of American Indians have been clearly in their own class, exceeding the average rates for all race/ethnic groups by 200 (in 2007) to 300 (1993) percent. However, American Indians also experienced a dramatic improvement in mortality rates for motor vehicle-related injuries. Compared to a rate of 94.1/100,000 in 1996, the 2007 mortality rate of 49.0/100,000 was 48 percent lower. Blacks or African Americans had an equally impressive reduction in their mortality risk for motor vehicle-related injuries. The mortality rate for Blacks or African Americans declined by 52 percent from a peak rate of 28.1/100,000 in 1995 to 13.6/100,000 in 2007.

For both White non-Hispanics and Hispanics or Latinos their respective 2007 mortality rates (13.1/100,000 and 17.6/100,000) were the lowest rates of the entire fifteen-year period from 1993 to 2007. Due to small number of events occurring in a relatively small subpopulation, the mortality rates for motor vehicle-related injuries varied erratically from year to year among Asian or Pacific Islander residents of the State.

If the 2007 mortality risk for motor vehicle-related injuries of American Indians applied to all Arizonans, 3,152 would have died in motor vehicle accidents, 2,117 more than the 1,035 who actually did.

**Figure 1-2**  
**Age-Adjusted Mortality Rates\* for Motor Vehicle-Related Injuries by Race/Ethnicity and Year, Arizona Residents, 1993-2007**

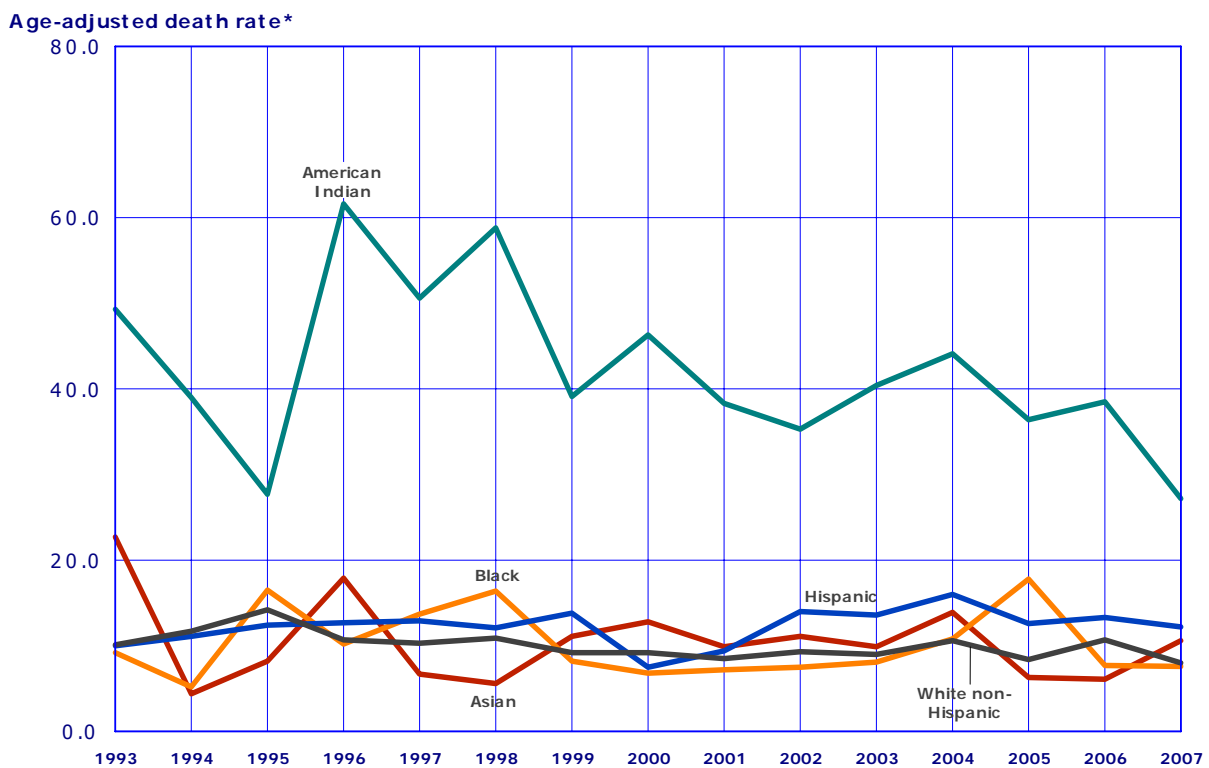


The changes over time in the mortality rates for motor vehicle-related injuries among Arizona female residents (**Figure 1-3**) resemble the temporal pattern for both genders by race/ethnicity. However, the reader is advised to notice that the scale required to accommodate the highest values in Figure 1-3 is only 2/3<sup>rd</sup> of the scale used in Figure 1-2.

In 2007, the mortality rate of American Indian females was 63 percent lower (27.2/100,000) than the mortality rate of their male counterparts (72.8/100,000). However, it continued to be in 1993 – 2007 the highest female mortality among the 5 race/ethnic groups in Arizona. The mortality rate for motor vehicle-related injuries among American Indian females declined by 55.8 percent from a recent peak of 61.6 deaths per 100,000 females in 1996 to 27.2/100,000 in 2007. The mortality rate for all Arizona female residents declined by 30 percent from a rate of 14.4/100,000 in 1995 to 10.1/100,000 in both 2001 and 2007. With only one exception (the mortality rate of Black or African American males in 1995), the mortality rates of American Indian females exceeded the corresponding mortality rates of their male counterparts in each year from 1993 to 2007, and in each race/ethnic group other than American Indians.

White non-Hispanic females were the only group whose mortality rates for motor vehicle-related injuries were consistently lower in each year from 1993 to 2007 than the yearly mortality rates of all Arizona female residents.

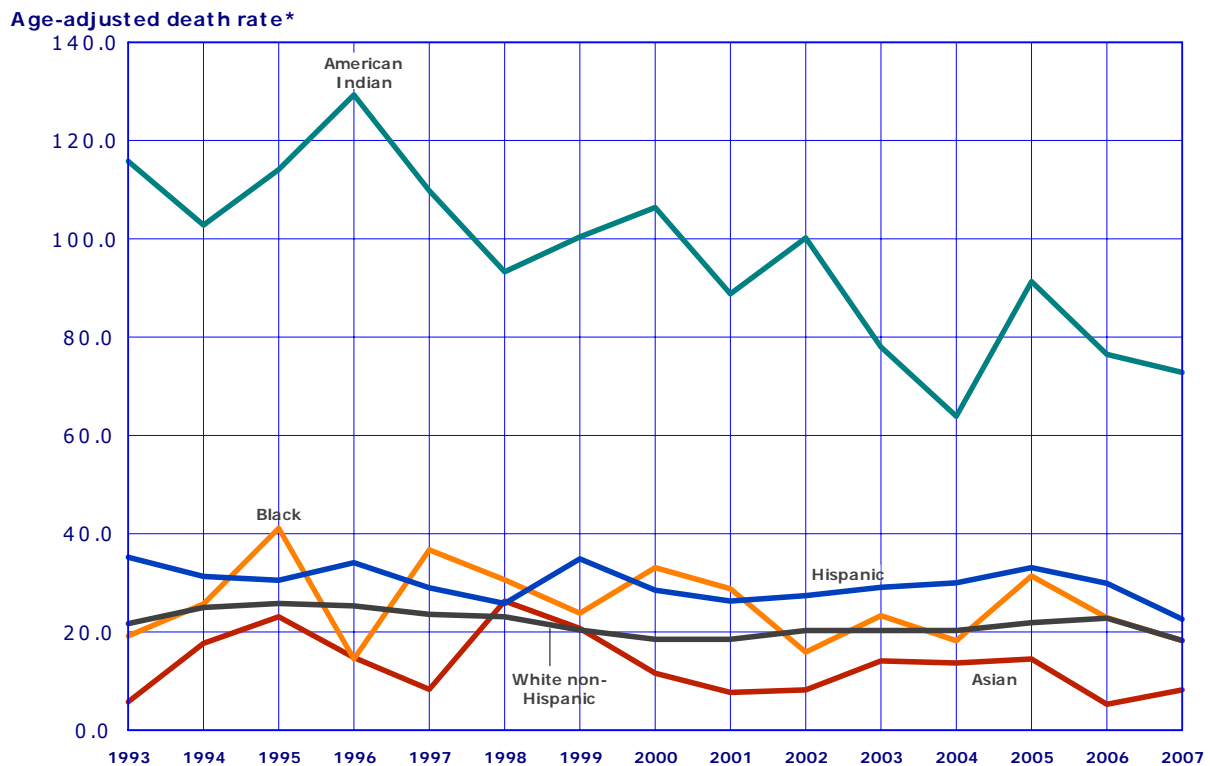
**Figure 1-3**  
**Age-Adjusted Mortality Rates\* for Motor Vehicle-Related Injuries by Race/Ethnicity and Year, Arizona Female Residents, 1993-2007**



In 2007, the mortality rates for motor vehicle-related injuries among Arizona male residents ranged from 8.2 deaths per 100,000 Asian or Pacific Islander males to 72.8/100,000 for American Indian males (**Figure 1-4**). In 1993 – 2007, the mortality rates of American Indian male residents of Arizona also have been in their own class, exceeding the average rates for all Arizona male residents by 185 (in 2006) to 340 (in 2000) percent. Again, the reader is advised to notice that the scale required to accommodate the highest values in Figure 1-4 (0-140) is greater than the scale used to depict the mortality rates for both genders in Figure 1-2 (0-120).

The mortality rate for motor vehicle-related injuries among Arizona male residents declined for the second consecutive year from 27.0 deaths per 100,000 persons in 2005 to 22.2/100,000 in 2007. The mortality rates for motor vehicle-related injuries also declined for the second consecutive year among American Indian males from 91.2/100,000 in 2005 to 72.8 deaths per 100,000 persons in 2007; Hispanic or Latino males (from 33.1/100,000 to 22.6/100,000; and Black or African American males (from 31.4/100,000 to 18.2/100,000). In contrast, Asian or Pacific Islander males experienced an increase from a mortality rate of 5.3/100,000 in 2006 to 8.2/100,000 in 2007. The mortality rates for motor vehicle-related injuries among Asian or Pacific Islander males varied erratically from a high of 26.3/100,000 in 1998 to a low of 5.3/100,000 in 2006.

**Figure 1-4**  
**Age-Adjusted Mortality Rates\* for Motor Vehicle-Related Injuries by Race/Ethnicity and Year, Arizona Male Residents, 1993-2007**



**Table 1-1  
Age-Adjusted Mortality Rates\* for Motor Vehicle-Related Injuries by Race/Ethnicity, Gender and Year,  
Arizona Residents, 1993-2007**

Year	All groups			White non-Hispanic			Hispanic or Latino			Black or African American			American Indian or Alaska Native			Asian or Pacific Islander		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
1993	20.1	27.8	12.6	15.8	21.7	10.1	22.3	35.2	10.0	15.0	19.2	9.2	80.4	115.8	49.3	15.8	5.8	22.7
1994	21.1	30.0	12.5	18.1	25.0	11.7	21.4	31.3	11.1	15.4	25.7	5.2	69.4	102.8	39.0	10.1	17.7	4.4
1995	23.1	32.0	14.4	19.9	25.8	14.2	21.8	30.5	12.4	28.1	41.1	16.5	69.0	114.1	27.7	15.4	23.1	8.2
1996	22.9	32.1	13.9	17.8	25.3	10.7	23.3	34.1	12.7	13.2	14.5	10.2	94.1	129.3	61.6	16.3	14.8	17.9
1997	20.5	28.2	12.7	16.9	23.6	10.3	20.9	29.0	12.9	23.9	36.7	13.7	79.4	109.8	50.6	7.9	8.3	6.7
1998	20.4	27.3	13.6	16.9	23.1	10.9	19.0	25.8	12.1	23.0	30.6	16.4	75.9	93.3	58.8	14.6	26.3	5.6
1999	19.6	27.5	11.8	14.6	20.4	9.2	24.4	34.9	13.8	16.3	23.8	8.2	68.4	100.4	39.1	15.3	20.7	11.1
2000	17.5	24.4	10.6	13.8	18.5	9.2	18.2	28.5	7.5	19.3	33.1	6.8	74.2	106.4	46.3	15.3	11.6	12.8
2001	17.2	24.2	10.1	13.5	18.5	8.5	18.2	26.3	9.4	19.1	28.8	7.2	63.2	88.8	38.3	8.6	7.7	9.9
2002	18.5	25.5	11.6	14.7	20.3	9.3	21.1	27.4	14.0	11.9	15.9	7.5	65.9	100.2	35.3	10.1	8.2	11.1
2003	18.0	24.9	11.2	14.6	20.3	9.0	21.3	29.1	13.6	15.2	23.3	8.1	59.0	78.0	40.4	11.8	14.1	9.9
2004	18.1	23.9	12.5	15.3	20.3	10.6	23.2	30.0	16.0	14.8	18.2	10.8	54.1	63.9	44.1	11.3	13.7	13.9
2005	18.9	27.0	11.1	15.0	21.9	8.4	22.7	33.1	12.6	24.9	31.4	17.8	62.6	91.3	36.4	10.2	14.5	6.3
2006	19.6	26.8	12.4	16.6	22.8	10.7	21.9	29.9	13.3	15.3	22.9	7.7	56.9	76.5	38.5	5.9	5.3	6.1
2007	16.2	22.2	10.1	13.1	18.3	8.0	17.6	22.6	12.2	13.6	18.2	7.6	49.0	72.8	27.2	9.9	8.2	10.6

\* Number of deaths per 100,000 population in specified group age-adjusted to the 2000 U.S. standard.



**2.**  
**PATTERNS IN MORTALITY FROM MOTOR VEHICLE-**  
**RELATED INJURIES BY SINGLE-YEAR OF AGE,**  
**GENDER AND RACE/ETHNICITY,**  
**ARIZONA RESIDENTS,**  
**1993-2007**





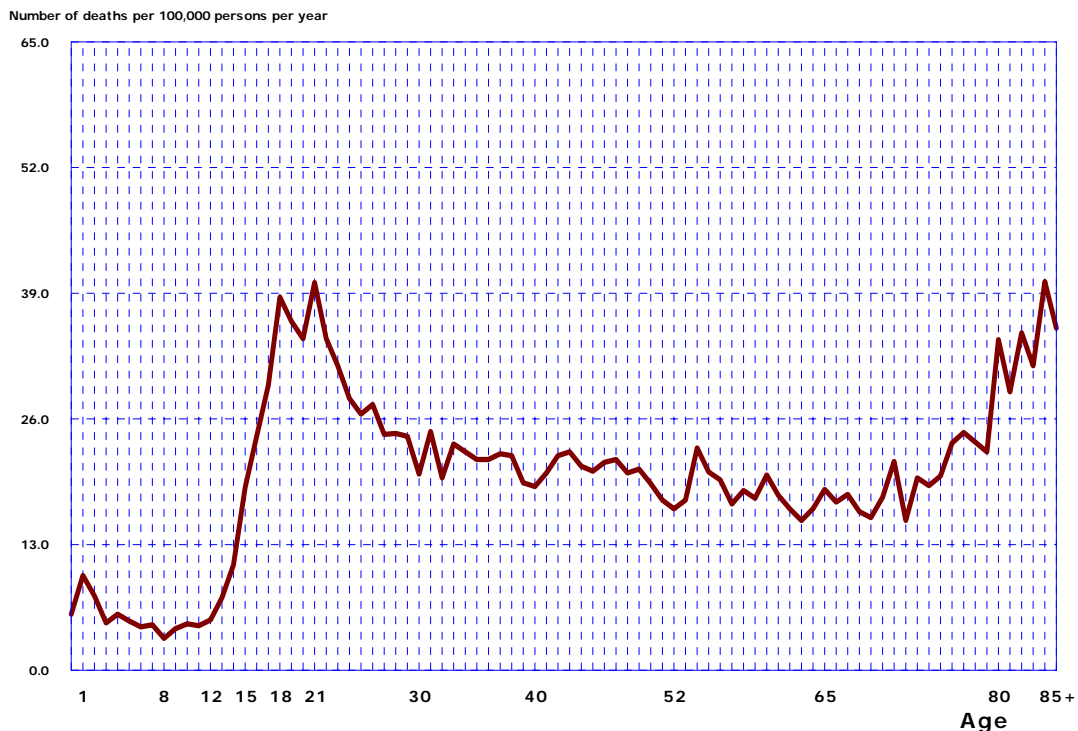
From 1993 to 2007, 15,005 Arizona residents died from injuries in motor vehicle accidents. We have selected the 15-year period to look in detail at mortality risks by single-year of age, gender, and race/ethnicity. There are obvious advantages in using cumulative data for a longer period of time:

- 1) The data accumulated over a 15-year period greatly improve the reliability of mortality rates, because they are based on a larger number of deaths (the numerators used to compute the rates). It is also important to note that neither the mortality risk nor the number of deaths from motor vehicle-related injuries are distributed uniformly by age. In fact, they are highly concentrated at certain ages. In 2007, adolescents (15-19 years) and young adults (20-44 years) disproportionately accounted for 57.3 of all motor vehicle-related fatalities, while comprising 42.0 percent of Arizona's population. What it means is that at certain other ages the 2007 mortality risk was zero (for example, unlike Arizonans aged 92 or 94 years in 2007, those who were 93 years old experienced no deaths in motor vehicle accidents).
- 2) By selecting this particular period of time, 1993-2007, we were able to use the 2000 Census enumerations of Arizona residents by single-year of age as the denominators to compute the rates;
- 3) The data accumulated over a 15-year period greatly reduce the distorting effects of an anomalous year and allow for establishing a reliable baseline.

Statisticians use the term modality, which refers to the number of humps or modes in a distribution. The 1993-2007 distribution of motor vehicle-related mortality rates by single-year of age (Figure 2-1, Table 2-1) contains a considerable number of humps.

**Figure 2-1**

**Average Annual Mortality Rates\* for Motor Vehicle-Related Injuries by Single-Year of Age among Arizona Residents: Fifteen-Year Summary for 1993-2007**

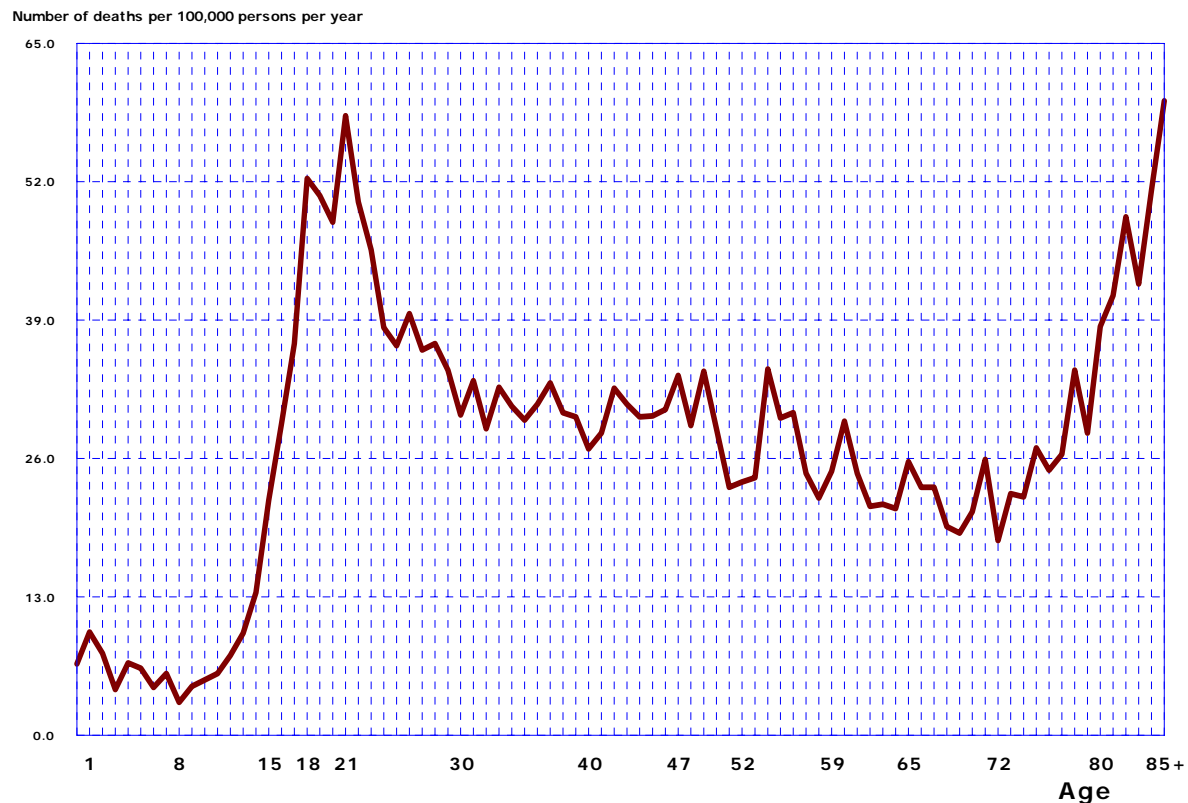


\*Total number of motor vehicle-related deaths for 1993-2007 per 100,000 persons per year. The year 2000 population counts (i.e., population at mid-point) multiplied by fifteen were used as the denominator.

However, there are two values greater than others. This mortality curve is bimodal, reaching the first peak at age 21 (40.1 deaths per 100,000 persons), tapering off, and then rising to a second peak at age 84 (40.2 deaths per 100,000 persons). Interestingly, 21 year olds shared the mortality risk in motor vehicle accidents with persons exactly 4 times their age.

For Arizona males in 1993-2007, the two peaks in the distribution of mortality rates for motor vehicle-related injuries were at age 21 (58.2 deaths per 100,000 males) and at the open-ended age category of 85+ years (59.6 deaths per 100,000 males; **Figure 2-2**). Beginning at age 9, all age-specific mortality rates of males were considerably greater than the corresponding female rates. At age 49, the male to female mortality risk ratio was as high as 4.4:1 (**Table 2-1**).

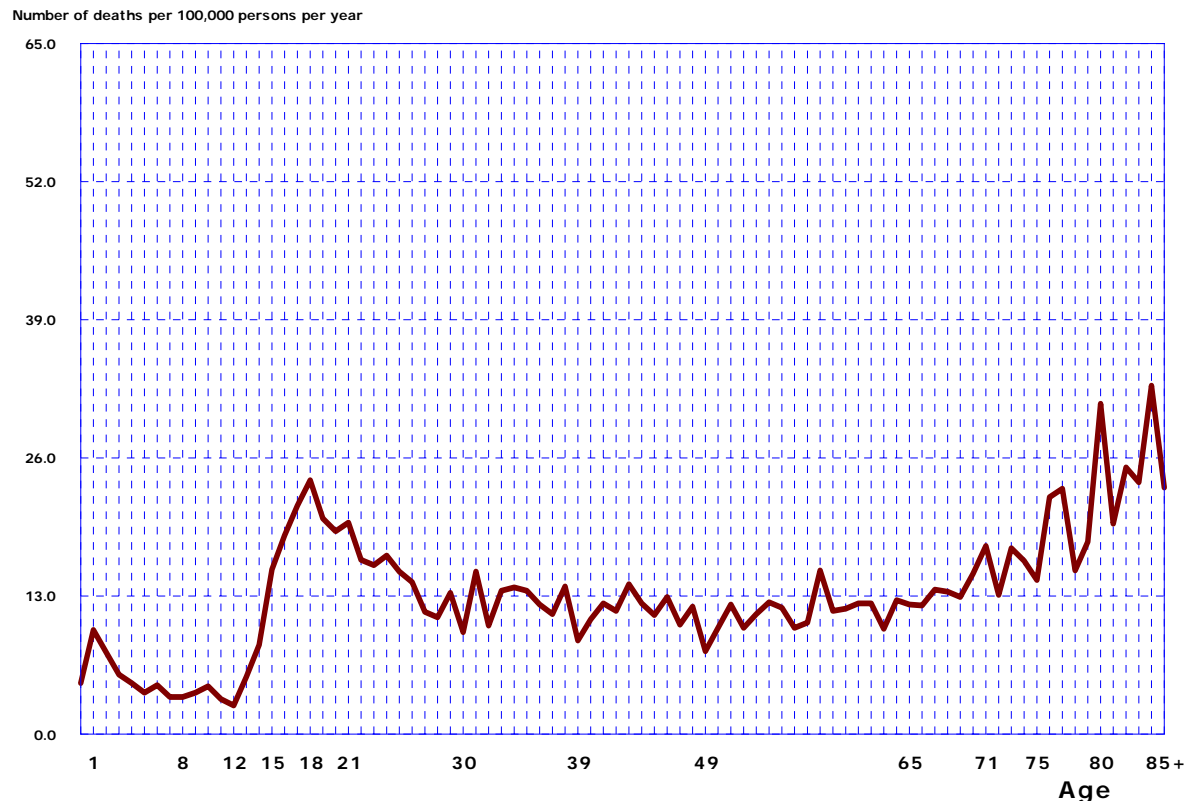
**Figure 2-2**  
**Average Annual Mortality Rates\* for Motor Vehicle-Related Injuries by Single-Year of Age among Arizona Male Residents: Fifteen-Year Summary for 1993-2007**



\*Total number of motor vehicle-related deaths for 1993-2007 per 100,000 persons per year. . . .  
 The year 2000 population counts (i. e., population at mid-point) multiplied by fifteen were used as the denominator.

For Arizona females in 1993-2007, the mortality curve reached the first peak at age 18 (23.9 deaths per 100,000 females), it then tapered off, and rose to a second peak at age 84 (32.8 deaths per 100,000 females; **Figure 2-3**, **Table 2-1**). At age 21, the male (58.2 deaths per 100,000 males) to female (19.9 deaths per 100,000 females) mortality risk ratio was 2.9:1 (**Table 2-1**).

**Figure 2-3**  
**Average Annual Mortality Rates\* for Motor Vehicle-Related Injuries by Single-Year of Age among Arizona Female Residents: Fifteen-Year Summary for 1993-2007**

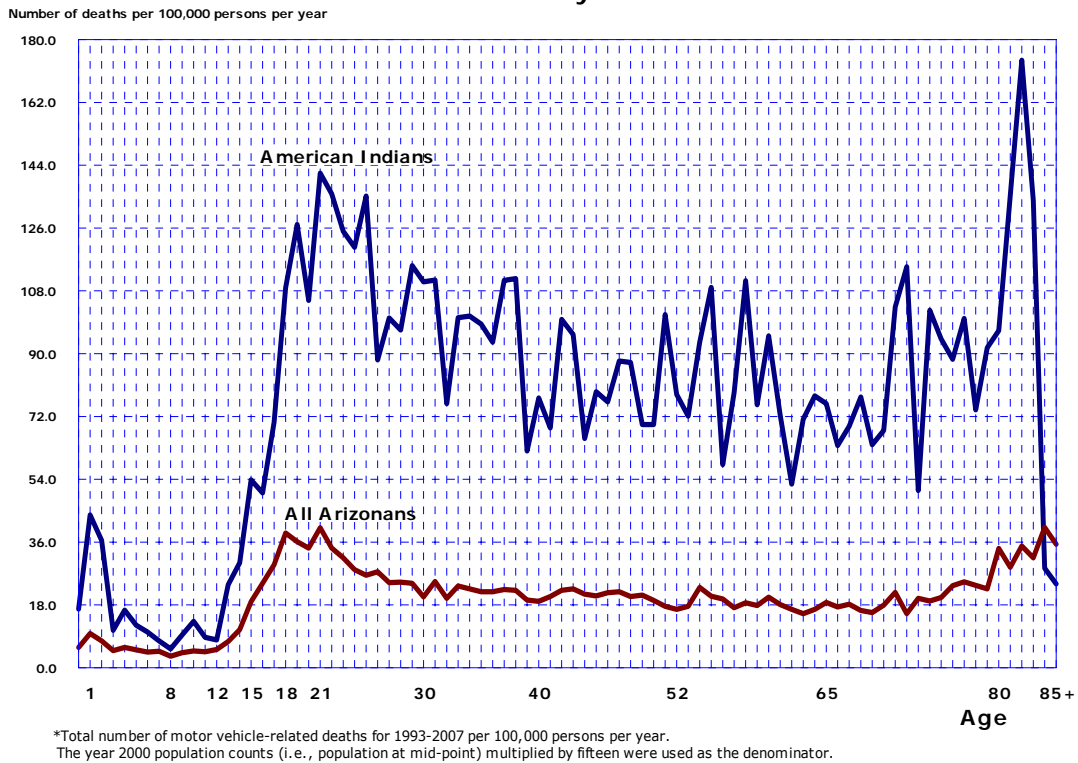


\*Total number of motor vehicle-related deaths for 1993-2007 per 100,000 persons per year. The year 2000 population counts (i.e., population at mid-point) multiplied by fifteen were used as the denominator.

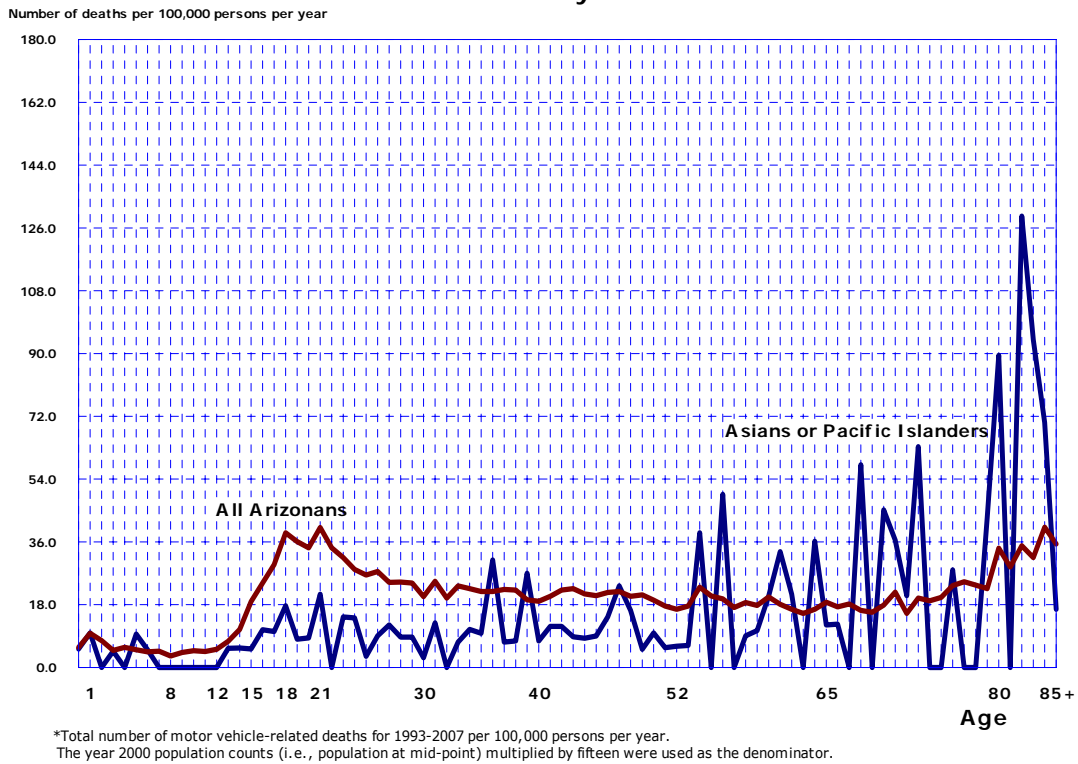
The race/ethnicity-specific patterns in mortality from motor vehicle-related injuries in 1993-2007 are shown in **Figure 2-4** (American Indian residents of Arizona), **Figure 2-5** (Asians or Pacific Islanders), **Figure 2-6** (Blacks or African Americans), **Figure 2-7** (Hispanics or Latinos), and **Figure 2-8** (White non-Hispanics). The five visual representations are based on the data in **Table 2-2**.

While **Figure 2-1** is quite suggestive that no specific age confers immunity from injuries and/or deaths in motor vehicle accidents, the distributions for the two smaller race/ethnic groups, Asians and Blacks, are erratic and include a number of discontinuities. In the fifteen-year period from 1993 to 2007, there were no deaths in motor vehicle accidents at certain ages among Asians and Blacks. All mortality rates by single-year of age among American Indians (with the exception of the oldest 85+) exceeded the corresponding average rates for all groups (**Figure 2-4**). In contrast, the majority of age-specific rates among White non-Hispanics (**Figure 2-8**) were lower than the average rates for all groups.

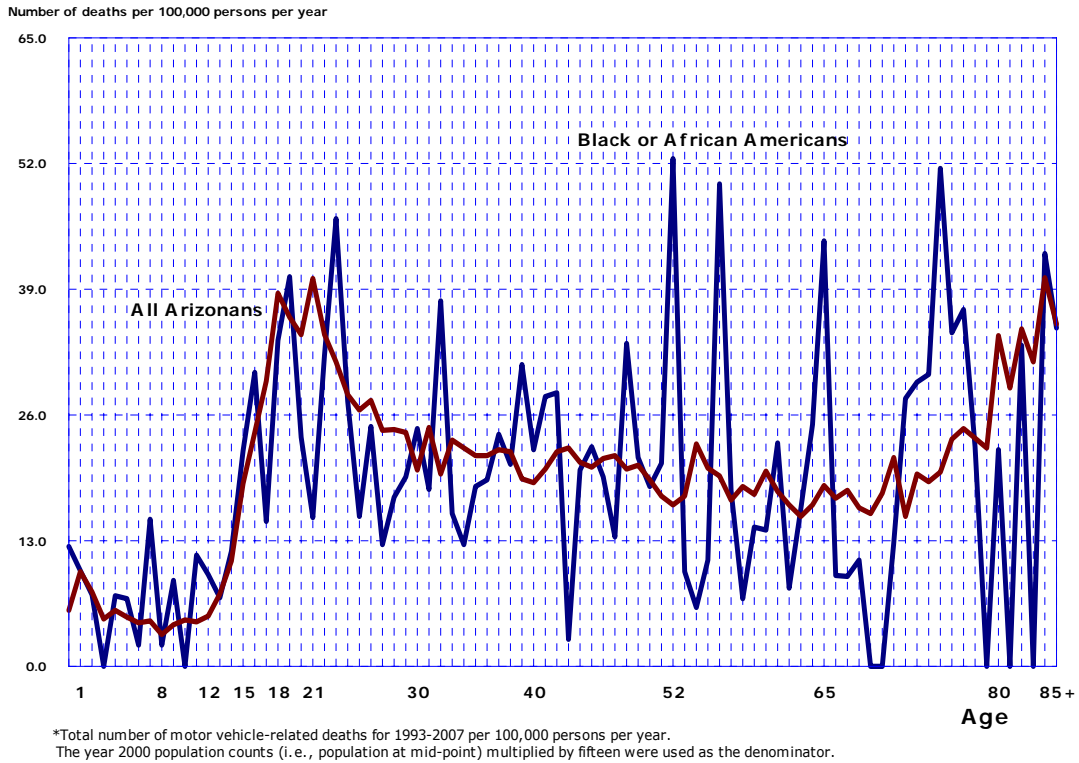
**Figure 2-4**  
**Average Annual Mortality Rates\* for Motor Vehicle-Related Injuries by Single-Year of Age among American Indians or Alaska Natives and all Arizona Residents:**  
**Fifteen-Year Summary for 1993-2007**



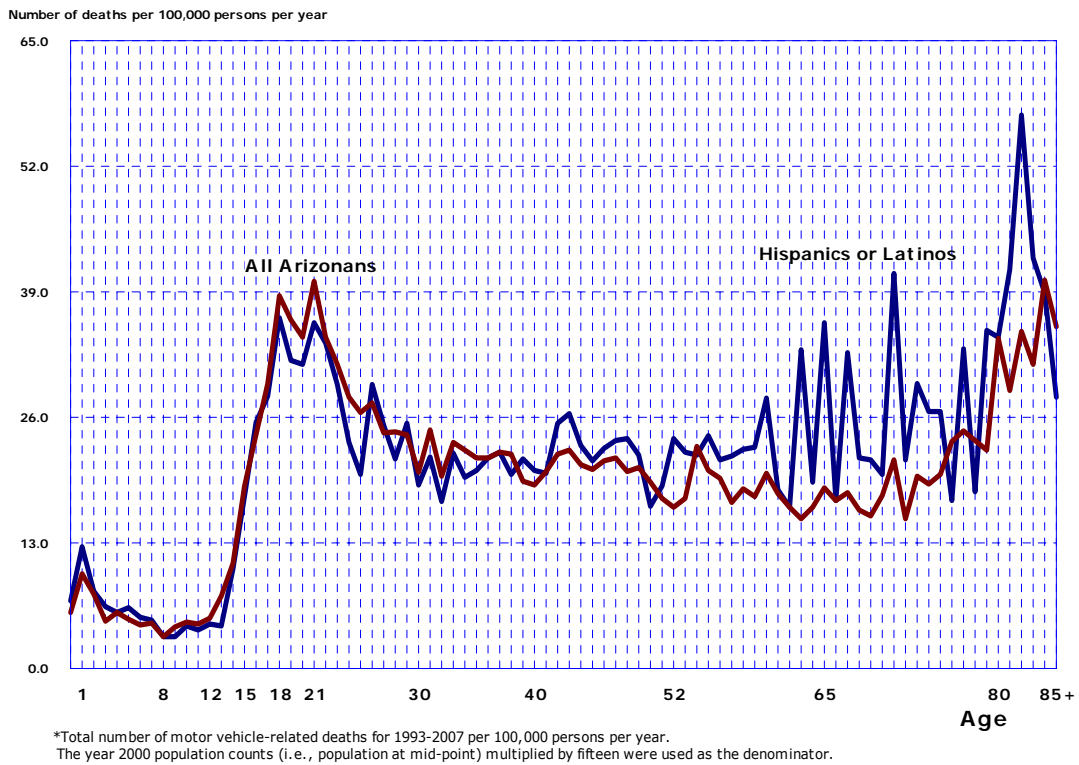
**Figure 2-5**  
**Average Annual Mortality Rates\* for Motor Vehicle-Related Injuries by Single-Year of Age among Asians or Pacific Islanders and all Arizona Residents:**  
**Fifteen-Year Summary for 1993-2007**



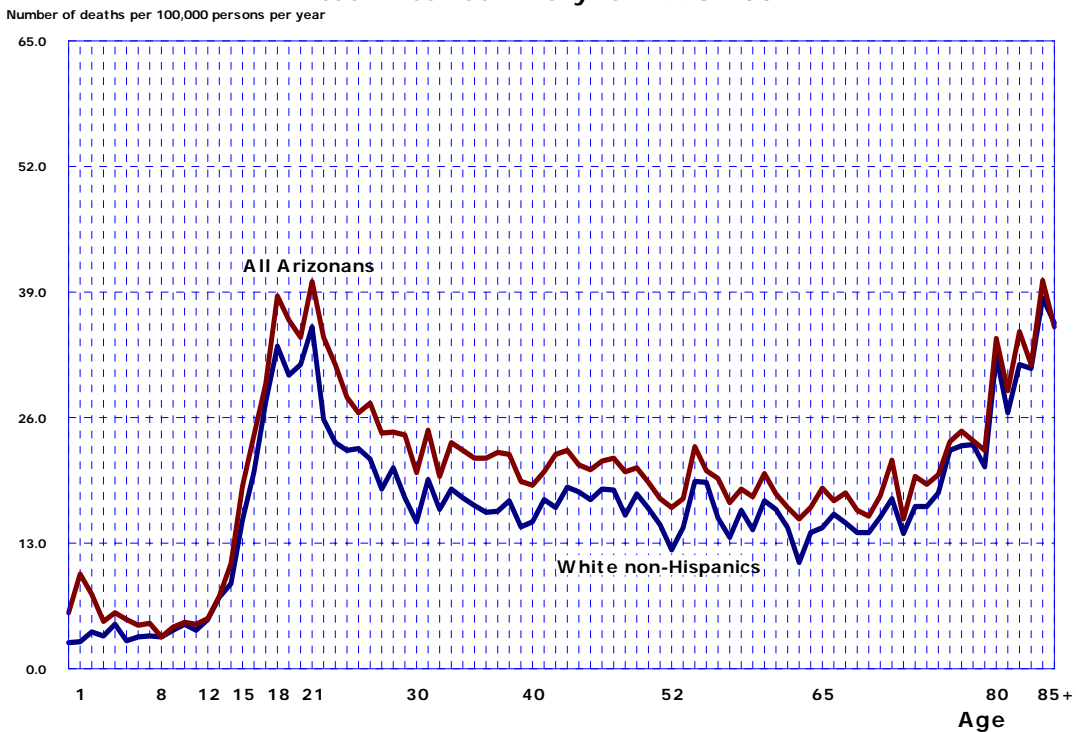
**Figure 2-6**  
**Average Annual Mortality Rates\* for Motor Vehicle-Related Injuries by Single-Year**  
**of Age among Blacks or African Americans and all Arizona Residents:**  
**Fifteen-Year Summary for 1993-2007**



**Figure 2-7**  
**Average Annual Mortality Rates\* for Motor Vehicle-Related Injuries by Single-Year**  
**of Age among Hispanics or Latinos and all Arizona Residents:**  
**Fifteen-Year Summary for 1993-2007**



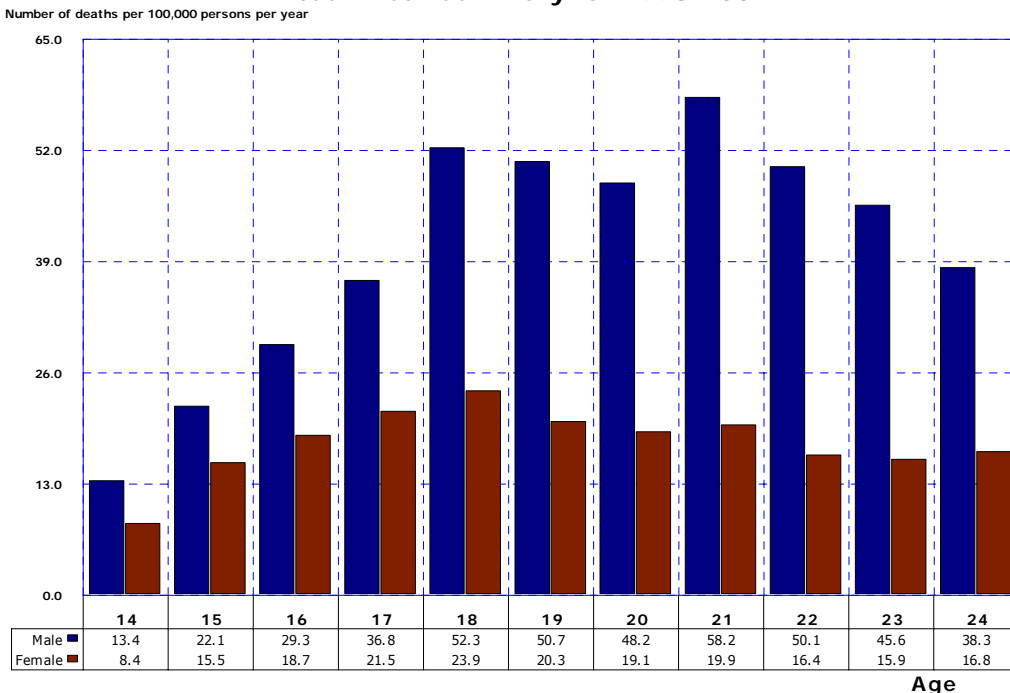
**Figure 2-8**  
**Average Annual Mortality Rates\* for Motor Vehicle-Related Injuries by Single-Year**  
**of Age among White non-Hispanics and all Arizona Residents:**  
**Fifteen-Year Summary for 1993-2007**



\*Total number of motor vehicle-related deaths for 1993-2007 per 100,000 persons per year.  
 The year 2000 population counts (i.e., population at mid-point) multiplied by fifteen were used as the denominator.

While no specific age confers immunity from injuries and/or deaths in motor vehicle accidents, reaching the legal age to become a licensed driver of a motor vehicle, dramatically increases the mortality risk for both males and females (Figure 2-9).

**Figure 2-9**  
**Average Annual Mortality Rates\* for Motor Vehicle-Related Injuries by Single-Year**  
**of Age and Gender among Arizona Residents Ages 14-24 Years:**  
**Fifteen-Year Summary for 1993-2007**



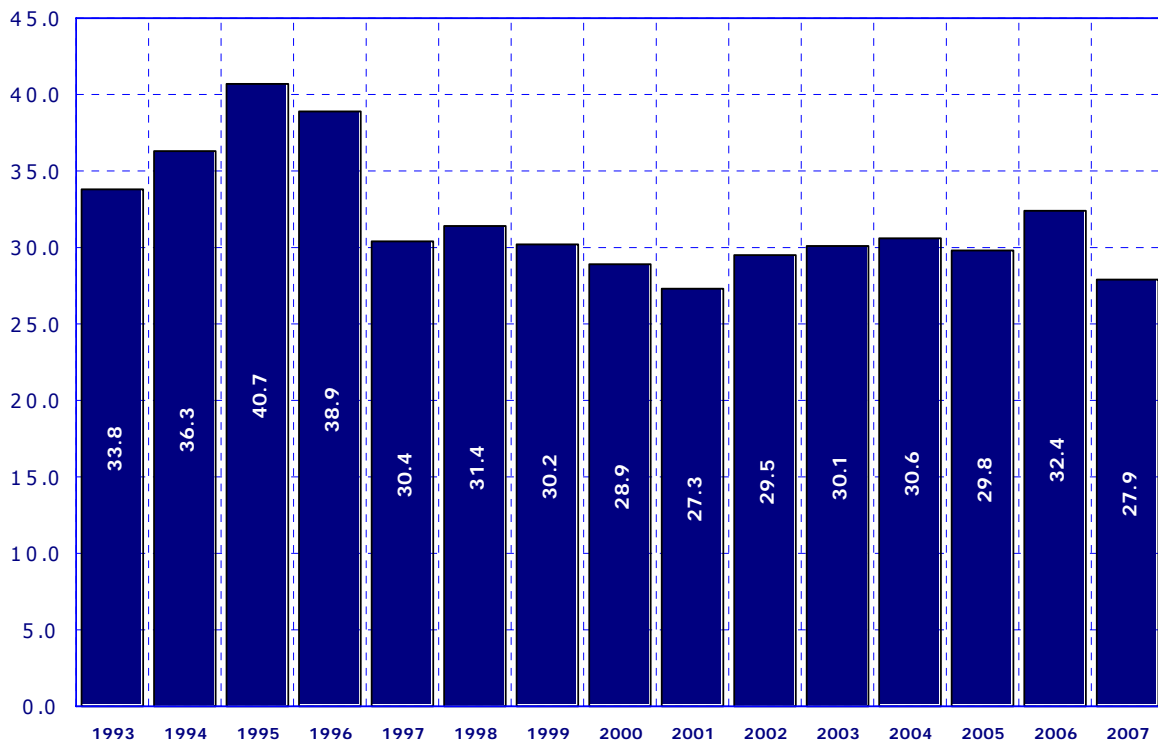
\*Total number of motor vehicle-related deaths for 1993-2007 per 100,000 persons per year.  
 The year 2000 population counts (i.e., population at mid-point) multiplied by fifteen were used as the denominator.

In 1993-2007, compared to a male mortality rate of 13.4/100,000 at age 14, the mortality rate at age 18 was 3.9 times greater (52.3/100,000), and 4.3 times greater at age 21 (58.2/100,000). The magnitude of the increase in the mortality was not quite as steep among females. Compared to a female mortality rate in motor vehicle accidents of 8.4/100,000 at 14, the mortality rate was 2.2 times as high at age 16 (18.7/100,000), and 2.8 times greater at age 18 (23.9/100,000).

The use of cumulative data for 1993-2007 has its limitations, too. It produces a “snapshot” of a period in time and it gives no sense of direction: it cannot be used to evaluate the changes in mortality risks from 1993 to 2007. However, the reader of Section 2 shall find here two types of data tables: Table 2-1 and Table-2-2 present the numerators, the denominators, and the mortality rates computed for the entire period from 1993 to 2007; while Table 2-3 and Table 2-4 show the age group-specific mortality rates by year (the urban/rural comparisons in Table 2-4 only are available for 2000-2007).

Adolescents and young adults 15-24 year olds were the age group with the second highest death rate from motor vehicle accidents in every year observed, whereas, in 1993-2007, Arizona 85 years and older had the highest mortality rate among the age groups; **Table 2-3**). The mortality rate for motor vehicle-related injuries among adolescents and young adults 15-24 years old declined by 31.4 percent from a recent peak of 40.7/100,000 in 1995 to 27.9/100,000 in 2007. The latter was the second lowest mortality rate in the fifteen-year period from 1993 to 2007 (the lowest rate of 27.3/100,000 was in 2001).

**Figure 2-10**  
**Mortality Rates\* for Motor Vehicle-Related Injuries by Year among Adolescents and Young Adults 15-24 Years, Arizona Residents, 1993-2007**



\* Number of deaths in motor vehicle accidents per 100,000 adolescents and young adults 15-24 years old.

**Table 2-1**  
**Cumulative Number of Deaths in Motor Vehicle Accidents and Average Annual Mortality Rates\***  
**by Single-Year of Age and Gender for 1993-2007**

Age	Both genders			Male			Female		
	Year 2000 population	Number of deaths	Average annual mortality rate	Year 2000 population	Number of deaths	Average annual mortality rate	Year 2000 population	Number of deaths	Average annual mortality rate
Under 1 year	77,421	67	5.8	39,591	40	6.7	37,830	27	4.8
1 year	77,174	113	9.8	39,223	57	9.7	37,951	56	9.8
2 years	75,241	87	7.7	38,855	45	7.7	36,386	42	7.7
3 years	75,990	56	4.9	38,847	25	4.3	37,143	31	5.6
4 years	76,560	67	5.8	39,118	40	6.8	37,442	27	4.8
5 years	76,755	59	5.1	39,376	37	6.3	37,379	22	3.9
6 years	76,447	52	4.5	38,832	26	4.5	37,615	26	4.6
7 years	78,435	55	4.7	40,165	35	5.8	38,270	20	3.5
8 years	78,567	39	3.3	40,268	19	3.1	38,299	20	3.5
9 years	79,665	51	4.3	40,835	28	4.6	38,830	23	3.9
10 years	79,783	58	4.8	41,004	32	5.2	38,779	26	4.5
11 years	75,929	52	4.6	39,029	34	5.8	36,900	18	3.3
12 years	75,073	58	5.2	38,450	43	7.5	36,623	15	2.7
13 years	73,595	83	7.5	37,675	54	9.6	35,920	29	5.4
14 years	73,831	121	10.9	37,906	76	13.4	35,925	45	8.4
15 years	72,640	206	18.9	37,418	124	22.1	35,222	82	15.5
16 years	71,043	258	24.2	36,884	162	29.3	34,159	96	18.7
17 years	72,798	322	29.5	37,835	209	36.8	34,963	113	21.5
18 years	74,292	430	38.6	38,348	301	52.3	35,944	129	23.9
19 years	76,949	417	36.1	40,123	305	50.7	36,826	112	20.3
20 years	76,165	392	34.3	39,803	288	48.2	36,362	104	19.1
21 years	71,929	433	40.1	38,020	332	58.2	33,909	101	19.9
22 years	71,610	368	34.3	37,907	285	50.1	33,703	83	16.4
23 years	71,787	339	31.5	37,738	258	45.6	34,049	81	15.9
24 years	71,369	301	28.1	37,618	216	38.3	33,751	85	16.8
25 years	74,465	296	26.5	39,118	215	36.6	35,347	81	15.3
26 years	71,108	293	27.5	37,074	220	39.6	34,034	73	14.3
27 years	72,969	267	24.4	38,163	207	36.2	34,806	60	11.5
28 years	75,783	278	24.5	39,469	218	36.8	36,314	60	11.0
29 years	79,781	290	24.2	41,576	214	34.3	38,205	76	13.3
30 years	80,131	244	20.3	41,857	189	30.1	38,274	55	9.6
31 years	72,915	270	24.7	38,036	190	33.3	34,879	80	15.3
32 years	71,992	215	19.9	37,500	162	28.8	34,492	53	10.2
33 years	70,800	249	23.4	36,707	180	32.7	34,093	69	13.5
34 years	72,721	247	22.6	37,566	174	30.9	35,155	73	13.8
35 years	79,378	259	21.8	40,753	181	29.6	38,625	78	13.5
36 years	78,071	255	21.8	39,671	185	31.1	38,400	70	12.2
37 years	77,746	261	22.4	39,505	196	33.1	38,241	65	11.3
38 years	79,287	264	22.2	40,312	183	30.3	38,975	81	13.9
39 years	78,205	228	19.4	39,423	177	29.9	38,782	51	8.8
40 years	80,811	230	19.0	41,164	166	26.9	39,647	64	10.8
41 years	74,815	229	20.4	37,560	160	28.4	37,255	69	12.3
42 years	76,426	254	22.2	38,419	188	32.6	38,007	66	11.6
43 years	72,935	247	22.6	36,399	170	31.1	36,536	77	14.1
44 years	71,130	225	21.1	35,451	159	29.9	35,679	66	12.3
45 years	71,781	222	20.6	35,967	162	30.0	35,814	60	11.2
46 years	67,797	219	21.5	33,154	152	30.6	34,643	67	12.9
47 years	65,966	216	21.8	32,391	164	33.8	33,575	52	10.3
48 years	64,072	196	20.4	31,380	137	29.1	32,692	59	12.0
49 years	62,287	194	20.8	30,586	157	34.2	31,701	37	7.8
50 years	64,023	185	19.3	31,470	136	28.8	32,553	49	10.0



**Table 2-1**  
**Cumulative Number of Deaths in Motor Vehicle Accidents and Average Annual Mortality Rates\***  
**by Single-Year of Age and Gender for 1993-2007**

Age	Both genders			Male			Female		
	Year 2000 population	Number of deaths	Average annual mortality rate	Year 2000 population	Number of deaths	Average annual mortality rate	Year 2000 population	Number of deaths	Average annual mortality rate
51 years	60,565	160	17.6	29,488	103	23.3	31,077	57	12.2
52 years	62,629	157	16.7	30,575	109	23.8	32,054	48	10.0
53 years	60,717	160	17.6	29,507	107	24.2	31,210	53	11.3
54 years	48,067	166	23.0	23,271	120	34.4	24,796	46	12.4
55 years	50,024	154	20.5	24,171	108	29.8	25,853	46	11.9
56 years	49,798	147	19.7	23,781	108	30.3	26,017	39	10.0
57 years	50,426	130	17.2	23,872	88	24.6	26,554	42	10.5
58 years	45,806	128	18.6	21,528	72	22.3	24,278	56	15.4
59 years	42,621	114	17.8	20,135	75	24.8	22,486	39	11.6
60 years	42,862	130	20.2	20,338	90	29.5	22,524	40	11.8
61 years	41,154	112	18.1	19,535	72	24.6	21,619	40	12.3
62 years	40,645	102	16.7	19,535	63	21.5	21,110	39	12.3
63 years	39,538	92	15.5	18,702	61	21.7	20,836	31	9.9
64 years	39,498	99	16.7	18,813	60	21.3	20,685	39	12.6
65 years	39,982	112	18.7	19,198	74	25.7	20,784	38	12.2
66 years	36,728	96	17.4	17,444	61	23.3	19,284	35	12.1
67 years	37,630	103	18.2	18,036	63	23.3	19,594	40	13.6
68 years	37,089	91	16.4	17,716	52	19.6	19,373	39	13.4
69 years	37,578	89	15.8	17,876	51	19.0	19,702	38	12.9
70 years	37,955	102	17.9	18,107	57	21.0	19,848	45	15.1
71 years	34,940	113	21.6	16,490	64	25.9	18,450	49	17.7
72 years	35,172	82	15.5	16,349	45	18.3	18,823	37	13.1
73 years	33,565	100	19.9	15,302	52	22.7	18,263	48	17.5
74 years	33,202	95	19.1	15,171	51	22.4	18,031	44	16.3
75 years	32,554	98	20.1	14,577	59	27.0	17,977	39	14.5
76 years	30,384	107	23.5	13,379	50	24.9	17,005	57	22.3
77 years	28,229	104	24.6	12,380	49	26.4	15,849	55	23.1
78 years	27,655	98	23.6	12,033	62	34.3	15,622	36	15.4
79 years	25,379	86	22.6	11,049	47	28.4	14,330	39	18.1
80 years	22,387	115	34.2	9,734	56	38.4	12,653	59	31.1
81 years	20,173	87	28.8	8,403	52	41.3	11,770	35	19.8
82 years	18,551	97	34.9	7,667	56	48.7	10,884	41	25.1
83 years	15,892	75	31.5	6,597	42	42.4	9,295	33	23.7
84 years	14,269	86	40.2	5,731	44	51.2	8,538	42	32.8
85+ year	68,525	364	35.4	23,028	206	59.6	45,497	158	23.2

\*Cumulative number of motor vehicle-related deaths in 1993-2007 per 100,000 persons per year. The year 2000 population counts (i.e., population at mid-point multiplied by fifteen were used as the denominator.

**Table 2-2**  
**Cumulative Number of Deaths in Motor Vehicle Accidents and Average Annual Mortality Rates\***  
**by Single-Year of Age and Race/Ethnicity for 1993-2007**

Age	American Indian or Alaska Native		Asian or Pacific Islander		Black or African American		Hispanic or Latino		White non-Hispanic	
	Number of deaths	Average annual mortality rate	Number of deaths	Average annual mortality rate	Number of deaths	Average annual mortality rate	Number of deaths	Average annual mortality rate	Number of deaths	Average annual mortality rate
Under 1 year	5	12.4	1.0	5.3	5	12.4	34	7.0	14	2.7
1 year	4	9.9	2.0	9.9	4	9.9	59	12.6	15	2.8
2 years	3	7.4	0.0	0.0	3	7.4	36	8.0	20	3.8
3 years	0	0.0	1.0	4.7	0	0.0	29	6.4	18	3.4
4 years	3	7.3	0.0	0.0	3	7.3	26	5.8	25	4.6
5 years	3	7.0	2.0	9.6	3	7.0	28	6.3	16	2.9
6 years	1	2.2	1.0	5.1	1	2.2	23	5.3	18	3.3
7 years	7	15.2	0.0	0.0	7	15.2	22	5.0	19	3.4
8 years	1	2.2	0.0	0.0	1	2.2	14	3.3	19	3.3
9 years	4	8.9	0.0	0.0	4	8.9	14	3.3	24	4.0
10 years	0	0.0	0.0	0.0	0	0.0	18	4.4	28	4.6
11 years	5	11.5	0.0	0.0	5	11.5	15	4.0	24	4.0
12 years	4	9.5	0.0	0.0	4	9.5	17	4.6	30	5.1
13 years	3	7.1	1.0	5.5	3	7.1	16	4.4	43	7.4
14 years	5	11.9	1.0	5.6	5	11.9	37	10.3	52	8.8
15 years	9	22.3	1.0	5.3	9	22.3	62	17.8	90	15.4
16 years	12	30.4	2.0	10.8	12	30.4	88	25.5	116	20.4
17 years	6	15.0	2.0	10.3	6	15.0	103	28.2	159	27.6
18 years	13	33.7	4.0	17.7	13	33.7	136	36.3	198	33.4
19 years	17	40.3	2.0	8.1	17	40.3	125	31.9	186	30.4
20 years	10	23.7	2.0	8.5	10	23.7	124	31.5	190	31.5
21 years	6	15.4	5.0	21.0	6	15.4	135	35.8	201	35.4
22 years	12	32.2	0.0	0.0	12	32.2	129	33.7	144	25.8
23 years	17	46.3	4.0	14.5	17	46.3	112	29.4	131	23.4
24 years	10	27.4	4.0	14.2	10	27.4	91	23.4	124	22.6
25 years	6	15.5	1.0	3.2	6	15.5	80	20.1	133	22.8
26 years	9	24.8	3.0	9.1	9	24.8	109	29.4	122	21.7
27 years	5	12.6	4.0	12.2	5	12.6	92	25.2	110	18.6
28 years	7	17.5	3.0	8.7	7	17.5	79	21.7	132	20.8
29 years	8	19.6	3.0	8.7	8	19.6	92	25.4	123	17.7
30 years	11	24.6	1.0	2.8	11	24.6	67	19.0	107	15.2
31 years	7	18.3	4.0	12.8	7	18.3	70	21.9	126	19.6
32 years	14	37.8	0.0	0.0	14	37.8	56	17.3	104	16.5
33 years	6	15.8	2.0	7.3	6	15.8	69	22.3	116	18.6
34 years	5	12.6	3.0	10.9	5	12.6	61	19.8	115	17.7
35 years	8	18.6	3.0	9.8	8	18.6	65	20.5	124	16.9
36 years	8	19.3	9.0	30.8	8	19.3	65	21.8	119	16.2
37 years	10	24.0	2.0	7.3	10	24.0	64	22.4	122	16.3
38 years	9	20.9	2.0	7.6	9	20.9	56	20.1	135	17.4
39 years	13	31.2	7.0	27.0	13	31.2	58	21.7	114	14.7
40 years	10	22.4	2.0	7.6	10	22.4	55	20.5	123	15.2
41 years	11	27.9	3.0	11.8	11	27.9	48	20.2	133	17.5
42 years	11	28.3	3.0	11.8	11	28.3	60	25.4	132	16.7
43 years	1	2.8	2.0	8.8	1	2.8	58	26.4	143	18.8
44 years	7	20.3	2.0	8.4	7	20.3	48	23.1	137	18.3
45 years	8	22.7	2.0	9.0	8	22.7	44	21.5	133	17.5
46 years	6	19.6	3.0	14.5	6	19.6	43	22.8	135	18.6
47 years	4	13.4	5.0	23.4	4	13.4	42	23.6	132	18.5
48 years	9	33.4	3.0	16.4	9	33.4	40	23.8	112	15.9
49 years	6	21.6	1.0	5.2	6	21.6	36	22.1	123	18.1
50 years	5	18.6	2.0	9.9	5	18.6	27	16.8	117	16.6

**Table 2-2  
Cumulative Number of Deaths in Motor Vehicle Accidents and Average Annual Mortality Rates\*  
by Single-Year of Age and Race/Ethnicity for 1993-2007**

Age	American Indian or Alaska Native		Asian or Pacific Islander		Black or African American		Hispanic or Latino		White non-Hispanic	
	Number of deaths	Average annual mortality rate	Number of deaths	Average annual mortality rate	Number of deaths	Average annual mortality rate	Number of deaths	Average annual mortality rate	Number of deaths	Average annual mortality rate
51 years	5	21.0	1.0	5.7	5	21.0	27	18.9	102	14.9
52 years	12	52.5	1.0	6.1	12	52.5	33	23.8	89	12.3
53 years	2	9.8	1.0	6.3	2	9.8	28	22.4	104	14.6
54 years	1	6.1	5.0	38.6	1	6.1	25	22.1	106	19.4
55 years	2	11.0	0.0	0.0	2	11.0	26	24.1	112	19.3
56 years	8	49.9	6.0	49.6	8	49.9	22	21.6	92	15.6
57 years	3	18.2	0.0	0.0	3	18.2	21	22.0	82	13.6
58 years	1	7.0	1.0	9.1	1	7.0	20	22.7	90	16.4
59 years	2	14.4	1.0	10.6	2	14.4	19	22.9	73	14.4
60 years	2	14.1	2.0	20.5	2	14.1	23	28.0	89	17.4
61 years	3	23.1	3.0	33.2	3	23.1	14	18.5	82	16.5
62 years	1	8.1	2.0	21.0	1	8.1	12	16.7	72	14.6
63 years	2	16.3	0.0	0.0	2	16.3	23	33.0	53	11.0
64 years	3	25.0	3.0	36.2	3	25.0	13	19.3	68	14.1
65 years	5	44.0	1.0	12.2	5	44.0	24	35.8	72	14.6
66 years	1	9.4	1.0	12.4	1	9.4	10	17.4	73	16.0
67 years	1	9.3	0.0	0.0	1	9.3	19	32.7	71	15.1
68 years	1	11.0	4.0	58.1	1	11.0	12	21.8	66	14.1
69 years	0	0.0	0.0	0.0	0	0.0	12	21.6	67	14.1
70 years	0	0.0	3.0	45.2	0	0.0	11	20.1	76	15.7
71 years	1	12.8	2.0	36.5	1	12.8	19	40.9	79	17.6
72 years	2	27.7	1.0	20.6	2	27.7	10	21.6	64	14.0
73 years	2	29.4	3.0	63.3	2	29.4	13	29.5	73	16.8
74 years	2	30.2	0.0	0.0	2	30.2	11	26.6	73	16.8
75 years	3	51.5	0.0	0.0	3	51.5	10	26.6	78	18.2
76 years	2	34.5	1.0	28.0	2	34.5	6	17.4	91	22.6
77 years	2	36.9	0.0	0.0	2	36.9	10	33.1	87	23.1
78 years	1	22.7	0.0	0.0	1	22.7	5	18.3	86	23.2
79 years	0	0.0	1.0	43.0	0	0.0	9	35.0	71	20.9
80 years	1	22.4	2.0	89.5	1	22.4	8	34.3	97	32.4
81 years	0	0.0	0.0	0.0	0	0.0	8	41.3	72	26.5
82 years	1	33.2	2.0	129.4	1	33.2	10	57.3	79	31.5
83 years	0	0.0	1.0	93.9	0	0.0	6	42.5	67	31.1
84 years	1	42.7	1.0	70.2	1	42.7	5	38.9	74	38.4
85+ year	6	35.0	1.0	16.7	6	35.0	18	28.1	328	35.8

\*Cumulative number of motor vehicle-related deaths in 1993-2007 per 100,000 persons per year. The year 2000 population counts (i.e., population at mid-point multiplied by fifteen) were used as the denominator.

**Table 2-3**  
**Age-Specific Mortality Rates for Motor Vehicle-Related Injuries by Race/Ethnicity**  
**Age Group and Year, Arizona Residents, 1993-2007**

		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
<b>All groups</b>	<1	7.4	5.9	8.4	9.7	4.1	6.6	9.0	7.7	7.5	4.8	4.7	2.3	1.1	2.1	4.9
	1-4	11.4	7.5	10.5	9.6	9.6	9.7	7.4	6.9	6.0	5.2	3.3	3.2	4.5	7.0	4.5
	5-14	6.2	6.0	8.1	8.2	7.9	5.0	5.0	5.3	5.0	4.6	6.2	5.2	4.5	3.0	3.9
	15-24	33.8	36.3	40.7	38.9	30.4	31.4	30.2	28.9	27.3	29.5	30.1	30.6	29.8	32.4	27.9
	25-34	26.3	26.8	26.4	27.8	25.4	24.5	20.3	19.3	22.1	19.2	18.1	19.2	22.8	24.3	19.2
	35-44	19.9	19.8	24.6	24.0	23.3	25.2	22.9	17.0	21.1	19.6	23.1	17.0	20.9	20.8	18.8
	45-54	17.6	20.2	21.1	20.2	18.6	19.8	22.0	18.6	14.9	22.4	20.2	19.9	22.3	25.1	17.0
	55-64	16.3	19.7	18.3	20.4	16.9	17.5	18.9	17.9	14.0	17.8	16.9	19.0	21.4	19.9	14.8
	65-74	16.3	17.2	20.5	19.0	18.7	20.9	19.0	17.0	14.6	18.8	13.5	18.5	17.8	13.9	14.3
	75-84	31.8	35.6	32.9	34.6	29.5	26.2	25.5	22.5	24.2	27.9	20.5	30.7	22.8	26.7	19.2
85+	42.0	43.3	48.2	40.3	46.8	34.9	42.3	39.4	32.4	32.8	31.9	37.4	19.9	26.1	24.9	
<b>White non Hispanic</b>	<1	2.7	2.7	5.3	2.6	2.7	0.0	10.9	5.8	0.0	0.0	0.0	0.0	0.0	0.0	4.6
	1-4	6.8	3.4	10.1	6.1	4.8	3.4	1.4	2.8	2.0	2.0	2.5	1.2	0.0	3.5	1.7
	5-14	5.5	6.0	7.4	5.9	7.5	4.4	3.6	4.4	3.2	2.2	5.8	4.7	2.6	3.0	3.5
	15-24	27.6	31.3	32.3	27.6	26.7	27.9	21.2	23.9	22.1	21.4	22.9	28.7	25.3	29.0	20.4
	25-34	17.3	21.6	23.1	20.3	19.8	17.6	14.3	15.0	14.7	14.9	12.3	15.1	17.4	20.4	15.9
	35-44	16.0	17.1	19.2	19.9	18.5	20.6	15.7	11.6	15.8	15.7	20.6	13.4	14.6	15.2	13.9
	45-54	14.1	16.2	18.6	15.1	14.0	17.0	16.8	15.5	13.5	17.8	16.9	16.4	18.7	20.9	16.1
	55-64	12.0	17.7	17.0	16.4	14.6	15.0	15.4	13.3	11.8	16.5	11.6	16.7	19.0	17.6	12.4
	65-74	13.8	14.0	18.7	17.4	15.9	18.9	18.1	12.7	12.9	16.1	11.8	14.2	14.0	12.7	11.1
	75-84	29.1	34.7	32.0	34.6	24.5	24.2	23.1	22.9	23.9	28.6	19.5	25.9	20.5	25.2	18.8
85+	42.5	48.6	49.8	37.3	50.5	33.7	40.4	36.0	30.0	33.7	29.7	37.3	22.2	29.4	26.3	
<b>Hispanic or Latino</b>	<1	19.3	9.3	17.0	8.1	3.8	14.4	10.0	3.1	9.0	8.7	8.5	0.0	2.6	2.4	4.4
	1-4	12.0	8.9	11.9	7.8	11.8	12.9	9.3	11.6	8.0	4.6	4.5	5.8	9.8	9.9	5.3
	5-14	6.3	3.0	7.3	8.4	7.0	5.5	4.6	5.2	4.3	4.5	5.4	6.2	6.3	3.3	5.1
	15-24	31.9	35.7	34.4	41.2	26.9	26.2	31.8	28.8	27.9	32.3	27.7	32.0	28.5	34.1	33.1
	25-34	31.6	24.2	27.3	25.2	19.7	26.7	23.5	18.1	28.0	19.0	22.0	17.4	23.8	22.9	17.9
	35-44	19.2	21.2	29.3	22.7	19.0	17.9	28.8	21.2	21.1	20.4	22.9	19.2	27.7	27.5	20.5
	45-54	18.8	25.0	18.6	23.5	21.7	17.9	26.1	18.0	11.9	29.3	22.4	28.4	20.1	33.7	15.8
	55-64	23.9	25.1	4.8	25.1	28.0	16.2	30.8	30.3	18.9	20.0	32.4	26.7	22.7	16.7	19.2
	65-74	22.7	18.0	20.5	16.3	34.9	33.7	24.1	17.1	19.3	42.8	15.6	37.9	36.5	23.3	23.5
	75-84	45.4	43.5	41.0	31.0	44.3	14.0	33.1	6.2	23.9	17.4	39.4	60.4	53.0	22.0	13.6
85+	32.6	0.0	29.2	55.6	0.0	25.5	98.7	23.4	22.6	21.9	63.9	41.7	0.0	0.0	12.2	
<b>Black or African American</b>	<1	0.0	35.9	0.0	0.0	32.6	29.4	0.0	37.3	0.0	0.0	0.0	0.0	0.0	24.0	0.0
	1-4	8.2	8.2	8.0	0.0	15.6	7.4	21.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4
	5-14	0.0	10.8	16.6	0.0	12.3	2.9	8.4	6.8	13.1	6.4	2.9	6.0	5.8	4.2	4.3
	15-24	26.4	16.4	30.7	33.3	21.3	24.2	26.9	19.1	18.5	21.5	22.9	30.2	45.4	23.3	19.2
	25-34	16.1	15.2	11.3	7.2	10.6	31.2	17.1	19.1	33.2	14.3	13.0	33.5	16.2	17.4	10.3
	35-44	10.2	14.0	51.7	4.0	26.5	40.1	17.7	3.7	32.3	17.4	19.0	19.5	25.1	13.5	19.0
	45-54	29.1	17.5	15.9	29.3	26.7	12.3	28.7	40.3	16.7	16.2	19.7	15.2	53.7	7.0	10.1
	55-64	14.1	13.2	24.9	0.0	22.2	32.3	0.0	31.5	0.0	0.0	9.0	0.0	26.8	44.0	22.9
	65-74	0.0	41.1	20.0	19.2	0.0	0.0	16.7	33.9	16.4	15.9	29.0	0.0	28.8	10.5	9.6
	75-84	42.7	0.0	78.9	0.0	147.0	35.2	0.0	0.0	34.0	0.0	0.0	0.0	0.0	24.9	13.4
85+	0.0	0.0	118.9	112.2	0.0	105.3	0.0	101.2	0.0	0.0	86.7	0.0	0.0	0.0	59.1	

**Table 2-3  
Age-Specific Mortality Rates for Motor Vehicle-Related Injuries by Race/Ethnicity  
Age Group and Year, Arizona Residents, 1993-2007**

		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
<b>American Indian or Alaska Native</b>	<1	0.0	0.0	0.0	75.9	0.0	0.0	0.0	19.8	57.5	18.6	17.3	35.9	0.0	0.0	15.4
	1-4	35.8	28.0	12.0	45.3	30.1	35.7	31.5	9.9	24.0	37.3	4.3	4.5	8.7	18.7	21.1
	5-14	14.6	14.3	10.2	26.1	11.3	9.5	14.0	11.9	16.4	22.3	14.8	4.6	10.5	1.5	1.6
	15-24	104.3	104.0	141.8	133.1	85.4	88.7	95.9	87.4	82.4	99.9	106.2	46.2	72.8	61.2	68.6
	25-34	120.4	103.6	80.0	148.0	132.8	98.0	72.1	80.9	73.0	80.9	70.7	65.6	96.3	93.6	73.6
	35-44	96.2	64.5	72.8	100.9	110.3	112.5	91.0	86.6	94.5	83.8	68.3	58.1	80.7	67.7	67.5
	45-54	80.1	80.3	74.8	90.0	92.5	85.1	83.6	66.4	60.2	93.4	79.8	60.2	83.8	83.5	48.4
	55-64	94.0	49.3	85.8	113.6	35.7	55.2	81.0	78.4	62.0	53.5	74.8	58.4	75.5	75.9	38.9
	65-74	80.9	115.9	86.0	93.4	67.8	66.2	43.6	164.0	45.3	22.0	41.0	96.3	83.0	15.7	54.6
	75-84	123.4	89.2	28.9	55.0	158.0	153.6	123.1	101.0	48.9	47.4	22.1	162.4	22.5	100.4	76.8
	85+	0.0	0.0	0.0	74.7	73.0	68.5	0.0	216.1	209.1	67.6	0.0	67.2	0.0	0.0	0.0
<b>Asian or Pacific Islander</b>	<1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	240.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1-4	20.0	0.0	0.0	0.0	0.0	15.3	0.0	18.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	5-14	0.0	0.0	7.7	7.3	7.1	0.0	0.0	7.9	7.6	0.0	0.0	0.0	0.0	0.0	0.0
	15-24	7.5	0.0	27.3	6.5	12.4	17.6	16.8	6.5	6.3	0.0	21.7	5.7	5.5	8.9	8.6
	25-34	6.1	22.6	0.0	4.9	9.3	0.0	12.8	9.5	4.6	4.4	4.0	12.5	4.0	3.0	8.8
	35-44	0.0	7.4	13.5	25.0	5.8	11.1	31.6	17.1	11.0	5.3	9.5	10.0	14.5	7.1	13.6
	45-54	0.0	12.7	34.1	40.7	9.2	17.1	23.7	24.3	0.0	15.2	6.8	7.1	13.8	0.0	4.8
	55-64	0.0	20.6	18.6	0.0	0.0	44.8	0.0	0.0	14.1	27.3	36.6	12.8	24.8	8.1	22.9
	65-74	81.2	35.7	31.0	0.0	26.1	0.0	0.0	23.3	45.1	21.9	39.1	0.0	0.0	13.2	40.2
	75-84	0.0	0.0	0.0	92.9	0.0	73.0	65.6	0.0	0.0	60.2	0.0	113.4	54.9	34.1	0.0
	85+	478.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

**Table 2-4**  
**Age-Specific Mortality Rates for Motor Vehicle-Related Injuries by Urban/Rural Area\*,**  
**Gender, Age Group and Year, Arizona Residents, 2000-2007**

			2000	2001	2002	2003	2004	2005	2006	2007
Arizona	Total	<1	7.7	7.5	4.8	4.7	2.3	1.1	2.1	4.9
		1-4	6.9	6.0	5.2	3.3	3.2	4.5	7.0	4.5
		5-14	5.3	5.0	4.6	6.2	5.2	4.5	3.0	3.9
		15-24	28.9	27.3	29.5	30.1	30.6	29.8	32.4	27.9
		25-34	19.3	22.1	19.2	18.1	19.2	22.8	24.3	19.2
		35-44	17.0	21.1	19.6	23.1	17.0	20.9	20.8	18.8
		45-54	18.6	14.9	22.4	20.2	19.9	22.3	25.1	17.0
		55-64	17.9	14.0	17.8	16.9	19.0	21.4	19.9	14.8
		65-74	18.4	14.6	18.8	13.5	18.5	17.8	13.9	14.3
		75-84	22.5	24.2	27.9	20.5	30.7	22.8	26.7	19.2
	85+	39.4	32.4	32.8	31.9	37.4	19.9	26.1	24.9	
	Male	<1	7.6	9.8	4.7	9.2	4.5	0.0	2.0	5.8
		1-4	7.0	6.2	6.6	2.9	4.0	3.9	6.1	3.9
		5-14	6.4	6.6	4.5	7.9	5.6	4.8	3.4	4.9
		15-24	38.3	37.2	41.0	41.6	39.9	40.4	42.4	39.4
		25-34	29.5	33.7	27.8	26.3	25.8	32.2	34.9	26.5
		35-44	25.0	32.1	26.8	34.2	22.1	29.6	29.6	24.6
		45-54	27.6	22.6	34.1	28.4	28.2	34.6	36.3	25.1
		55-64	25.7	15.6	22.3	23.0	27.5	32.5	26.0	20.5
		65-74	22.1	19.1	25.1	14.3	20.1	22.2	19.9	18.1
		75-84	31.5	33.3	34.2	17.9	35.6	35.0	29.8	26.8
	85+	52.1	42.0	57.0	63.4	73.0	51.4	47.8	34.5	
	Female	<1	7.9	5.1	5.0	0.0	0.0	2.3	2.1	4.0
		1-4	6.7	5.8	3.8	3.7	2.4	5.2	8.0	5.2
		5-14	4.3	3.4	4.8	4.4	4.7	4.3	2.5	2.9
		15-24	18.6	16.4	16.9	17.5	20.5	18.2	21.7	15.3
		25-34	8.2	9.5	9.7	9.2	12.1	12.6	12.6	11.3
		35-44	8.9	9.9	12.3	11.7	11.8	12.0	11.4	12.7
		45-54	10.0	7.6	11.1	12.2	12.0	10.6	14.0	9.0
		55-64	10.8	12.5	13.7	11.4	11.3	11.3	14.4	9.5
65-74		15.1	10.6	13.2	12.8	17.0	13.8	8.4	11.1	
75-84		15.7	17.3	23.1	22.5	27.0	13.4	24.2	13.1	
85+	33.0	27.6	20.6	16.0	19.4	3.8	14.4	19.2		
Urban	Total	<1	6.1	5.9	5.7	4.2	1.3	1.3	2.4	3.4
		1-4	7.0	5.3	3.3	2.5	1.7	4.3	5.8	3.0
		5-14	5.1	4.6	3.4	4.9	4.5	4.2	3.1	3.4
		15-24	24.7	24.0	28.2	23.9	26.4	26.0	30.1	24.0
		25-34	16.7	19.0	16.2	14.3	16.2	20.0	21.0	16.4
		35-44	13.9	17.7	16.9	20.9	15.0	17.3	18.0	15.1
		45-54	17.9	12.4	19.3	15.7	16.4	18.6	21.9	15.0
		55-64	15.8	12.7	16.1	13.3	17.8	18.8	16.8	12.0
		65-74	15.1	13.2	16.7	11.1	15.7	16.9	13.6	12.6
		75-84	19.8	23.2	23.5	19.5	23.5	21.7	24.6	19.0
	85+	33.3	27.1	32.8	33.5	37.2	20.9	29.2	20.4	
	Male	<1	8.9	8.6	5.6	8.1	2.6	0.0	2.4	4.5
		1-4	6.8	5.9	3.6	2.8	2.0	3.9	5.9	2.9
		5-14	6.2	6.0	4.3	6.2	4.9	4.5	3.6	3.8
		15-24	33.5	32.3	39.5	31.8	35.2	35.2	37.9	33.9
		25-34	25.8	28.9	22.4	21.3	21.8	28.5	29.7	21.7
		35-44	21.9	27.8	23.3	30.9	18.8	23.2	26.4	20.5
		45-54	26.2	18.0	28.2	23.1	23.7	28.6	31.3	21.8
		55-64	24.2	14.0	22.6	19.2	24.6	29.3	21.2	15.8
		65-74	17.3	18.9	22.5	13.0	19.1	20.3	20.7	16.1
75-84		27.0	32.0	24.1	17.8	30.2	34.1	28.3	27.3	
85+	42.4	41.0	54.6	62.7	74.7	57.9	51.8	30.7		

**Table 2-4**  
**Age-Specific Mortality Rates for Motor Vehicle-Related Injuries by Urban/Rural Area\*,**  
**Gender, Age Group and Year, Arizona Residents, 2000-2007**

			2000	2001	2002	2003	2004	2005	2006	2007
	Female	<1	3.1	3.0	5.8	0.0	0.0	2.7	2.5	2.3
		1-4	7.2	4.6	3.0	2.2	1.4	4.8	5.6	3.0
		5-14	3.9	3.1	2.4	3.5	4.0	3.9	2.7	2.9
		15-24	15.1	14.9	15.7	15.3	16.8	15.9	21.8	13.2
		25-34	6.8	8.1	9.4	6.8	10.2	10.6	11.3	10.5
		35-44	5.6	7.3	10.3	10.5	11.0	11.1	8.9	9.5
		45-54	9.9	7.0	10.7	8.7	9.4	9.0	12.5	8.3
		55-64	8.2	11.6	10.2	7.9	11.5	9.2	12.8	8.4
		65-74	13.1	8.2	11.6	9.5	12.7	13.9	7.3	9.6
		75-84	14.6	16.7	23.0	20.7	18.5	12.4	21.9	12.5
85+	28.8	20.2	22.1	19.1	18.5	2.2	17.4	14.3		
Rural	Total	<1	16.9	16.5	0.0	7.9	7.7	0.0	0.0	13.9
		1-4	6.3	10.2	15.8	7.7	11.3	5.5	14.3	13.8
		5-14	6.5	7.1	10.3	12.1	8.5	6.4	2.1	7.0
		15-24	50.4	44.4	36.6	61.5	52.0	50.1	43.2	45.5
		25-34	36.2	43.5	39.1	44.0	39.6	41.4	46.6	37.9
		35-44	34.0	38.9	34.6	35.3	28.1	41.1	37.7	41.5
		45-54	21.1	26.6	36.6	39.9	36.1	39.7	40.4	26.5
		55-64	24.6	18.8	24.3	30.6	23.8	31.5	33.1	26.7
		65-74	30.7	18.7	26.6	22.4	28.6	21.1	14.7	20.6
		75-84	34.1	28.7	47.2	25.1	62.7	27.5	34.7	19.9
	85+	69.3	59.0	32.8	24.0	38.8	15.1	11.7	44.8	
	Male	<1	0.0	16.2	0.0	15.4	15.1	0.0	0.0	13.6
		1-4	8.2	8.0	23.3	3.8	14.9	3.6	7.1	10.2
		5-14	7.1	9.7	5.4	15.8	9.0	6.3	2.7	11.0
		15-24	63.0	63.3	49.0	92.8	65.2	68.3	63.9	64.6
		25-34	54.4	67.1	64.9	61.6	53.8	56.5	71.0	58.7
		35-44	42.2	54.5	46.4	53.1	40.4	66.5	49.7	51.5
		45-54	32.3	43.9	61.2	51.5	47.8	62.8	60.4	41.6
		55-64	29.0	21.7	21.1	37.0	37.6	44.6	46.3	40.4
		65-74	38.6	17.5	34.0	19.0	22.9	29.1	17.2	25.0
		75-84	49.9	38.8	75.3	18.4	57.6	38.8	35.5	24.8
	85+	95.8	46.6	68.0	66.3	64.4	20.9	31.2	49.6	
	Female	<1	34.5	16.9	0.0	0.0	0.0	0.0	0.0	14.2
		1-4	4.3	12.5	8.1	11.9	7.7	7.5	21.8	17.6
		5-14	5.9	4.4	15.5	8.3	8.0	6.5	1.4	2.9
		15-24	36.8	24.0	23.2	27.6	37.8	30.5	21.2	25.1
		25-34	17.0	18.7	12.0	25.5	24.6	25.6	21.2	16.4
		35-44	26.1	23.9	23.2	18.1	16.1	16.9	26.0	32.0
		45-54	10.4	10.1	13.1	28.7	24.8	17.9	21.5	12.4
		55-64	20.6	16.0	27.2	24.7	11.0	19.5	21.1	14.0
65-74		22.9	19.8	19.2	25.8	34.2	13.2	12.3	16.6	
75-84		20.8	20.3	23.6	30.7	67.0	18.1	34.0	15.6	
85+	54.3	66.1	12.8	0.0	24.3	11.8	0.0	41.6		

\*Urban = Maricopa, Pima, Pinal, and Yuma counties. The remaining counties comprise Arizona's rural areas.





**3.**  
**CHARACTERISTICS OF PERSONS FATALLY INJURED**  
**BY MOTOR VEHICLES, ARIZONA RESIDENTS,**  
**1993-2007**



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.

Both the Ninth (ICD-9) and the Tenth Revision (ICD-10) of the International Classification of Diseases permit the classification of external causes: environmental events, circumstances, and conditions as the cause of injury, poisoning, and other adverse effects. In ICD-9, the codes for external causes of mortality and morbidity constituted a classification supplementary to the 17 main chapters, indicating the nature of the condition. Similarly, the codes for external causes of mortality in ICD-10 are intended to be used in addition to a code from another chapter of the classification, which indicates the nature of the condition. However, only one code is used for the underlying cause of death and the preference is given to the external causes. For example, in an underlying death statistic a death resulting from a base skull fracture sustained in an automobile accident would be classified as a motor vehicle accident. As a result, underlying cause statistics provide information about deaths resulting from motor vehicle accidents but not on deaths involving skull fractures\*. In ICD-10, the codes S00 – T98 for the nature of injuries that may be stated as due to external causes are classified in Chapter XIX: "Injury poisoning and certain other consequences of external causes".

In the Ninth Revision of the International Classification of Diseases the following fourth digits were used with categories E810 – E825 to identify the injured person:

- .0 Driver of motor vehicle other than motorcycle
- .1 Passenger in motor vehicle other than motorcycle
- .2 Motorcyclist
- .3 Passenger on motorcycle
- .4 Occupant of streetcar
- .5 Rider of animal; occupant of animal-drawn vehicle
- .6 Pedal cyclist
- .7 Pedestrian
- .8 Other specified person (includes: occupant of vehicle other than above, person in railway train involved in accident, unauthorized rider of motor vehicle)
- .9 Unspecified person

In 1993-1997, there were 6,741 resident deaths in motor vehicle accidents and 76 specific four-character ICD-9 E-codes were used to describe the external cause of injury ranging from E8100 to E8259 (**Table 3-1a**; this table provides not only the actual frequency counts by year, but also the descriptions associated with the specific E-codes).

The Tenth Revision of the International Classification of Diseases is substantially more complex. 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. The simplicity of ICD-9 coding system used to identify the victim of a motor vehicle accident was replaced with a complicated structure of three-character categories and fourth-character subdivisions.

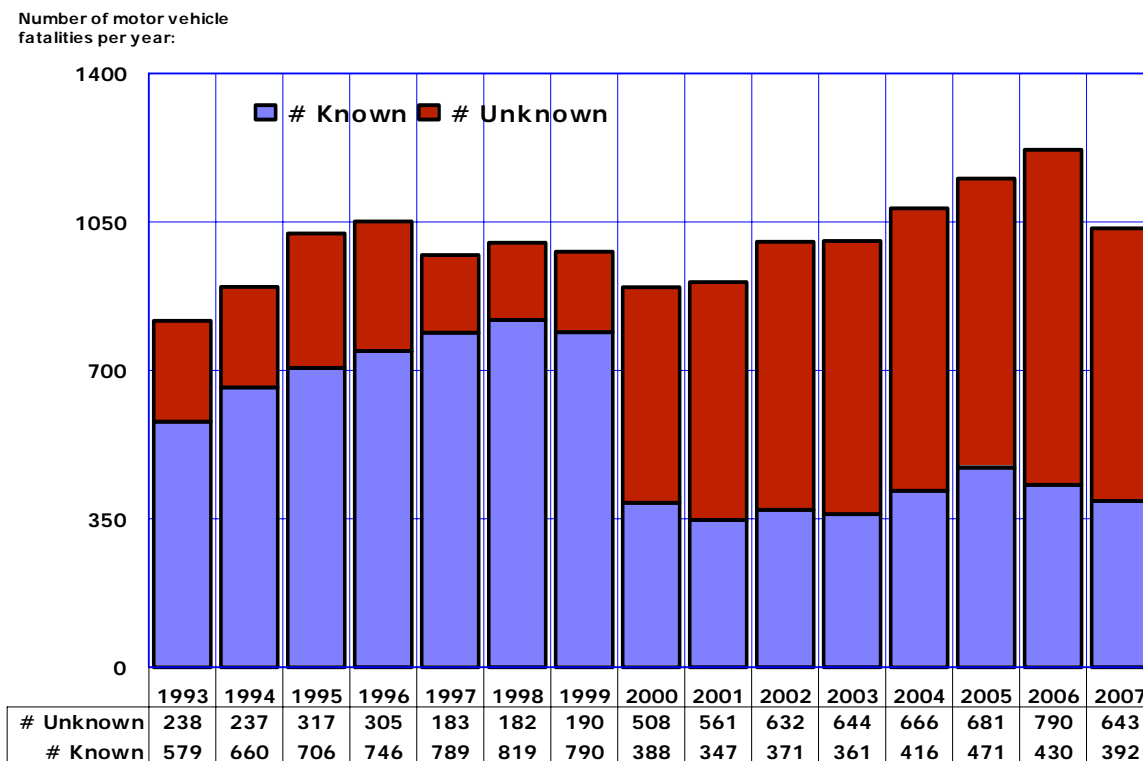
Injuries sustained by *pedestrians* are classified by ICD-10 codes V02-V04 and V090-V092. Two ranges of codes V12-V14 and V190-V196 are used to classify the injuries to *pedal cyclists*. The codes within the range of V20-V29 are used to classify the injuries of *motorcycle riders*. A rich variety of circumstances in which *occupants* of motor vehicles were injured in both traffic and nontraffic accidents is defined by the ICD-10 codes V30-V79, V803-V805, V810-V811, V820-V821, and V83-V86. Last but not least, the codes V870-V878, V880-V888, V890, and V892 apply to motor vehicle accidents where the *victim's mode of transport was unknown*.

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\* Multiple cause statistics would provide information on both.

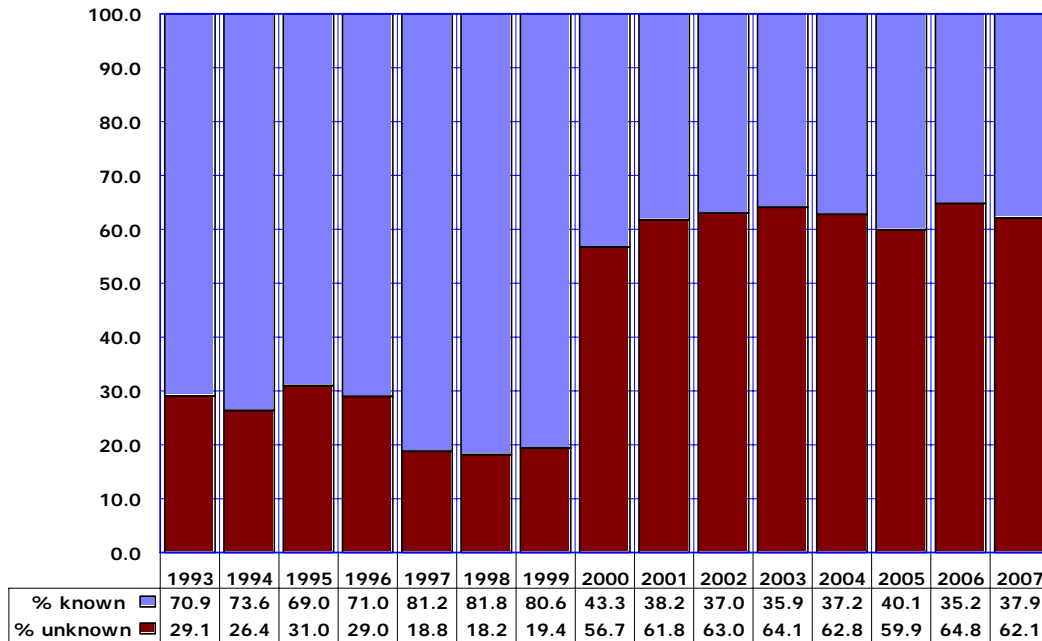
In 2000-2007, there were 8,264 resident deaths in motor vehicle accidents and 143 specific four-character ICD-10 V-codes were used to describe the external cause of injury ranging from V021 to V892 (**Table 3-1b**; this table also provides the actual frequency counts by year and the descriptions associated with the specific V-codes). Since the number of detailed categories used to describe the injuries in motor vehicle accidents almost doubled from 76 in 1993-1999 to 143 in 2000-2007 one could expect a substantial increase in the cognitive value of the epidemiology of accidental death. Unfortunately, the opposite happened, because beginning in 2000 the mode of transport has been unknown for the majority of the motor vehicle fatalities (**Figure 3-1**). In 2007, among the 1,035 motor vehicle-related deaths, the mode of transport was unknown for 643. Fortunately, the ICD-10 categories V87 and V88 exclude collisions involving pedal cyclists and pedestrians. However, we have lost the ability to properly identify other types of victims of motor vehicle accidents, such as drivers, persons on outside of vehicle, or persons injured while boarding or alighting.

**Figure 3-1**  
**Known and Unknown Type of Victims of Motor Vehicle Accidents by Year,**  
**Arizona Residents, 1993-2007**



The proportion of motor vehicle fatalities where victim type is unknown increased from a recent low of 18.2 percent in 1998 to 56.7 percent in 2000, and 64.8 percent in 2006 (**Figure 3-2**).

**Figure 3-2**  
**Percentage of Victims of Motor Vehicle Accidents whose Mode of Transport**  
**was Unknown, Arizona Residents, 1993-2007**



The reduction of trauma, death, and the associated social and economic costs stemming from accidents is approached most effectively by discovering and controlling their causes. From the epidemiologic perspective, accidents are not simple acts of fate, but rather ultimately predictable consequences of interaction between individual characteristics and environmental circumstances.\* It is not possible to design an effective prevention strategy without taking into consideration characteristics of victims of motor vehicle accidents. Air bags and seat belts are known to decrease the number of serious injuries and fatalities among the occupants of motor vehicles, but they do nothing for persons on outside of vehicles. Similarly, wearing a helmet may work well for a motorcycle rider but it's unlikely to help a pedestrian.

From 1993 to 2007, males accounted for 2.2 times more motor vehicle fatalities than did females (68.5 and 31.5 percent respectively. The percentages are based on data in **Table 3-2**). This male to female ratio fell to a ratio of 1.9:1 for occupant deaths (grouped together with persons of unknown victim status in **Table 3-2**), and rose to a ratio of 7.5:1 for motorcycle rider deaths (925 vs. 123), and a ratio of 10.7:1 for pedal cyclist deaths (321 vs. 30). The disproportionality of males relative to females was almost threefold among young adult (20-44 years, 2.8:1) but less than twofold among children and adolescent (19 years or younger, 1:8:1), and older adult (45 years and older, 1:8:1. The percentages are based on data in **Table 3-3**).

Among every 100 fatalities in 1993-2007, 46 were young adults, 36 were older adults, and 18 were children and adolescents. In other words, 64 percent of Arizonans fatally injured in a motor vehicle accident had not reached their 45<sup>th</sup> birthday. Young adults accounted for the majority of deaths to motorcycle riders (58.9 percent), but not deaths to pedestrians (39.9 percent) or pedal cyclist (39.0 percent). In fact, being a pedal cyclist (compared to a motorcycle rider or occupant of motor vehicle) was the least likely way in which a young adult was fatally injured (2 percent). In contrast, 28.8 percent of children 14 years or younger were pedestrians, and 5.6 percent were pedal cyclists when they were fatally injured in a vehicular collision (**Table 3-3**).

\* Joanne C. Gersten, O.M. Watterson, Fred Teitelbaum: *Accidental Deaths in Arizona*. Research Notes. Vol.2, No.2. Phoenix, Arizona Department of Health Services. August 1986. Pp. 1-2.

As shown in **Table 3-4**, American Indians fatally injured by motor vehicles from 1993 to 2007, were 27.2 times as likely to be pedestrians (24.5 percent) than motorcycle riders (0.9 percent), and 40.8 times more likely than pedal cyclists (0.6 percent). American Indians, comprising 5.3 percent of the State's population, accounted for 26 percent of fatally injured pedestrians but only 2.2 percent of fatally injured motorcycle riders. No different from the average for all groups, American Indian male residents of Arizona accounted for 2.2 times more motor vehicle fatalities than did American Indian females (1,737 vs. 793), but for 4 times as many pedestrian deaths as females (498 vs. 123, **Table 3-4**). Motorcycle fatalities were overwhelmingly (83.4 percent) a White-non-Hispanic phenomenon, while pedestrian fatalities were underrepresented among White non-Hispanics (43.6 percent). In 1993-2007, deaths to pedal cyclists were overrepresented among Blacks or African Americans (4.5 percent of all fatal injuries by motor vehicles, compared to a 2.3 percent average for all groups).

Compared to the average of 15.9 percent of all vehicular fatalities statewide, **pedestrians** were overrepresented as victims of motor vehicle accidents in Apache (25.4 percent), Gila (11.0 percent), Coconino (19.9 percent), and Navajo counties (19.1 percent. **Table 3-5**). These are four rural counties with significant American Indian populations. A timely response to the event is less likely in rural than in urban counties.

From 1993 to 2007, **motorcycle riders** accounted for 7 percent of all victims of motor vehicle accidents. The proportions of death to motorcycle riders were higher among the residents of Pima (9.7 percent), Cochise (8.9 percent), Yavapai (8.7 percent), Maricopa and Santa Cruz (7.9 percent) counties.

Among every 100 motor vehicle fatalities in 1993-2007, approximately 2 (2.3 percent) were **pedal cyclists**. Deaths to pedal cyclists were overrepresented among the residents of Yuma (4.1 percent), Maricopa (3.2 percent), and Pima (2.5 percent) counties.

It is important to note that in 1993-2007, approximately 7 percent of all resident deaths in motor vehicle accidents occurred out-of-State (1,050 out of 15,005).

Victims of motor vehicle accidents who were not classified as pedestrians, pedal cyclists, or motorcycle riders (both drivers and passengers) are shown as **other person** in Tables 3-2, 3-3, 3-4, and 3-5. This very heterogeneous group includes both drivers and non-driving occupants of motor vehicles except motorcycles, persons on outside of vehicle, persons injured while boarding or alighting, unspecified occupants of three-wheeled motor vehicles, unspecified occupants of pick-up trucks or vans, unspecified occupants of heavy transport vehicles, unspecified bus occupants, animal-riders or occupants of animal-drawn vehicles injured in collisions with motor vehicles, occupants of railway train or railway vehicle injured in collisions with motor vehicle accidents, occupants of streetcars, occupants of special vehicles mainly used on industrial premises, occupants of special vehicles mainly used in agriculture, occupants of special construction vehicles, and occupants of special all-terrain or other motor vehicles designed primarily for off-road use.

The Tenth Revision of the International Classification of Diseases evidently offers an impressive list of categories to classify the victims of motor vehicle-related injuries. For 2007, using the ICD-10 codes in Table 3-1b, we could identify 39 fatally injured drivers, and 58 non-driving occupants of motor vehicles. For comparison, the average annual number of driver deaths was 286/year in 1993-1999, while the average annual number of deaths of non-driving occupants of motor vehicles exceeded 190/year (based on data in Table 3-2). In 2000-2007, for 62 percent of resident deaths in motor vehicle accidents the mode of transport was unknown. Instead of providing misleading frequency counts for drivers and passengers of motor vehicles in Table 3-2, we consider this information to be not available (NA) for 2000-2007.

Table 3-1a  
 Resident Deaths in Motor Vehicle Accidents by Detailed Code for the Underlying Cause of Death as Classified in ICD-9  
 Arizona, 1993-1999

ICD-9 Code	Year of death									
	1993	1994	1995	1996	1997	1998	1999			
E8100	2	3	2	4	4	2	1			
E8101	1	0	1	1	2	0	2			
E8109	0	0	1	2	0	1	0			
E8110	1	0	1	0	0	0	0			
E8120	93	105	137	125	106	133	98			
E8121	53	63	77	71	70	76	42			
E8122	18	19	23	30	13	23	23			
E8123	5	3	1	2	2	0	0			
E8124	0	1	1	0	0	0	0			
E8126	0	0	0	2	0	0	0			
E8127	1	0	0	0	0	1	0			
E8128	0	0	0	2	2	0	1			
E8129	56	63	58	65	59	65	51			
E8130	0	1	0	3	1	0	0			
E8131	0	1	0	0	1	0	0			
E8136	17	20	29	24	33	19	16			
E8137	1	0	0	0	0	0	0			
E8138	0	1	0	0	0	3	0			
E8139	4	0	1	0	1	0	1			
E8142	0	0	0	0	1	0	0			
E8143	0	0	2	0	0	0	1			
E8146	0	1	0	0	2	1	7			
E8147	149	140	175	179	179	178	160			
E8149	1	0	0	0	0	0	0			
E8150	20	22	27	22	22	21	7			
E8151	14	9	12	9	8	10	7			
E8152	10	7	5	3	8	3	1			
E8153	0	1	0	1	1	1	3			
E8157	0	0	1	0	0	0	0			
E8159	8	8	9	10	9	11	4			
E8160	47	59	70	73	87	64	56			
E8161	42	33	36	62	61	46	34			
E8162	5	3	4	11	6	2	6			
E8163	0	0	0	1	0	1	1			
E8164	0	1	0	0	0	0	0			
E8168	0	0	0	0	0	1	0			
E8169	55	43	61	95	53	35	56			
E8171	0	1	0	0	0	0	0			
E8179	0	0	2	0	0	0	0			

Table 3-1a (continued)  
 Resident Deaths in Motor Vehicle Accidents by Detailed Code for the Underlying Cause of Death as Classified in ICD-9  
 Arizona, 1993-1999

ICD-9 Code	Year of death									
	1993	1994	1995	1996	1997	1998	1999			
E8180	3	3	0	1	4	6	6			
E8181	8	9	11	6	3	8	11			
E8182	1	0	0	1	0	0	1			
E8183	0	0	0	0	0	0	0			
E8187	1	0	0	0	0	0	0			
E8188	1	0	1	0	1	0	0			
E8189	11	8	12	16	5	9	7			
E8190	31	72	34	42	88	109	154			
E8191	32	58	37	46	58	86	110			
E8192	2	9	9	4	10	10	27			
E8193	0	0	1	1	3	1	1			
E8194	0	0	0	0	0	0	0			
E8196	0	0	0	0	1	0	0			
E8197	0	0	0	0	2	0	0			
E8198	1	0	1	0	0	2	4			
E8199	97	108	165	111	55	53	64			
E8208	0	0	0	0	1	0	0			
E8210	1	3	2	4	4	5	2			
E8211	0	0	0	1	0	0	1			
E8212	0	0	0	1	0	1	3			
E8217	0	1	0	2	0	0	0			
E8218	0	0	0	1	1	0	0			
E8219	1	2	3	4	0	4	5			
E8220	0	1	0	1	0	1	0			
E8221	1	0	0	0	0	0	0			
E8226	0	0	0	2	0	1	0			
E8227	10	7	4	2	1	2	1			
E8229	0	1	2	0	0	0	0			
E8230	1	0	0	0	0	0	0			
E8232	0	1	0	0	0	0	0			
E8249	1	3	0	0	0	2	0			
E8250	4	0	1	1	1	0	0			
E8251	1	0	1	3	1	0	0			
E8252	0	0	0	0	0	1	0			
E8255	0	0	0	0	0	1	0			
E8257	2	2	0	2	1	0	1			
E8259	4	1	3	2	1	2	2			
Total	817	897	1023	1051	972	1001	980			



**Table 3-1a (continued)**  
**Detailed Code Description for the Underlying Cause of Death as Classified in ICD-9 for Motor Vehicle Accidents**

**Motor Vehicle Traffic (E810-E819) and Non-Traffic (E820-E825) Accidents - for data table above**

For definitions of motor vehicle traffic accident, and related terms see definitions (e) to (k).

Excludes: accidents involving motor vehicle and aircraft (E840-E845).

The following fourth digits are for use with categories E810-E819 to identify the injured person.

- .0 Driver of motor vehicle other than motorcycle - See definition (1)
  - .1 Passenger in motor vehicle other than motorcycle - See definition (1)
  - .2 Motorcyclist - See definition (1)
  - .3 Passenger on motorcycle - See definition (1)
  - .4 Occupant of streetcar
  - .5 Rider of animal; occupant of animal-drawn vehicle
  - .6 Pedal cyclist - See definition (p)
  - .7 Pedestrian - See definition (r)
  - .8 Other specified person
  - .9 Unspecified person
- Includes: occupant of vehicle other than above person in railway train involved in accident unauthorized rider of motor vehicle

ICD-9 CODE	CODE DESCRIPTION
E8100	MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION WITH TRAIN INJURING DRIVER OF MOTOR VEHICLE OTHER THAN MOTORCYCLE
E8101	MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION WITH TRAIN INJURING PASSENGER IN MOTOR VEHICLE OTHER THAN MOTORCYCLE
E8109	MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION WITH TRAIN INJURING UNSPECIFIED PERSON
E8110	MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING RE-ENTRANT COLLISION WITH ANOTHER MOTOR VEHICLE INJURING DRIVER OF MOTOR VEHICLE OTHER THAN MOTORCYCLE
E8120	OTHER MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION WITH MOTOR VEHICLE INJURING DRIVER OF MOTOR VEHICLE OTHER THAN MOTORCYCLE
E8121	OTHER MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION WITH MOTOR VEHICLE INJURING PASSENGER IN MOTOR VEHICLE OTHER THAN MOTORCYCLE
E8122	OTHER MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION WITH MOTOR VEHICLE INJURING MOTORCYCLIST
E8123	OTHER MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION WITH MOTOR VEHICLE INJURING PASSENGER ON MOTORCYCLE
E8124	OTHER MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION WITH MOTOR VEHICLE INJURING OCCUPANT OF STREETCAR
E8126	OTHER MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION WITH MOTOR VEHICLE INJURING PEDAL CYCLIST
E8127	OTHER MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION WITH MOTOR VEHICLE INJURING PEDESTRIAN
E8128	OTHER MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION WITH MOTOR VEHICLE INJURING OTHER SPECIFIED PERSON
E8129	OTHER MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION WITH MOTOR VEHICLE INJURING UNSPECIFIED PERSON
E8130	MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION WITH OTHER VEHICLE INJURING DRIVER OF MOTOR VEHICLE OTHER THAN MOTORCYCLE
E8131	MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION WITH OTHER VEHICLE INJURING PASSENGER IN MOTOR VEHICLE OTHER THAN MOTORCYCLE
E8136	MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION WITH OTHER VEHICLE INJURING PEDAL CYCLIST
E8137	MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION WITH OTHER VEHICLE INJURING PEDESTRIAN
E8138	MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION WITH OTHER VEHICLE INJURING OTHER SPECIFIED PERSON
E8139	MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION WITH OTHER VEHICLE INJURING UNSPECIFIED PERSON
E8142	MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION WITH PEDESTRIAN INJURING UNSPECIFIED PERSON
E8143	MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION WITH PEDESTRIAN INJURING PASSENGER ON MOTORCYCLE
E8146	MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION WITH PEDESTRIAN INJURING PEDAL CYCLIST
E8147	MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION WITH PEDESTRIAN INJURING PEDESTRIAN
E8149	MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION WITH PEDESTRIAN INJURING UNSPECIFIED PERSON
E8150	OTHER MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION ON THE HIGHWAY INJURING DRIVER OF MOTOR VEHICLE OTHER THAN MOTORCYCLE
E8151	OTHER MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION ON THE HIGHWAY INJURING PASSENGER IN MOTOR VEHICLE OTHER THAN MOTORCYCLE
E8152	OTHER MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION ON THE HIGHWAY INJURING MOTORCYCLIST
E8153	OTHER MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION ON THE HIGHWAY INJURING PASSENGER ON MOTORCYCLE
E8157	OTHER MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION ON THE HIGHWAY INJURING PEDESTRIAN

**Table 3-1a (continued)**  
**Detailed Code Description for the Underlying Cause of Death as Classified in ICD-9 for Motor Vehicle Accidents**

ICD-9 CODE	CODE DESCRIPTION
E8159	OTHER MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING COLLISION ON THE HIGHWAY INJURING UNSPECIFIED PERSON
E8160	MOTOR VEHICLE TRAFFIC ACCIDENT DUE TO LOSS OF CONTROL, WITHOUT COLLISION ON THE HIGHWAY, INJURING DRIVER OF MOTOR VEHICLE OTHER THAN MOTORCYCLE
E8161	MOTOR VEHICLE TRAFFIC ACCIDENT DUE TO LOSS OF CONTROL, WITHOUT COLLISION ON THE HIGHWAY, INJURING PASSENGER IN MOTOR VEHICLE OTHER THAN MOTORCYCLE
E8162	MOTOR VEHICLE TRAFFIC ACCIDENT DUE TO LOSS OF CONTROL, WITHOUT COLLISION ON THE HIGHWAY, INJURING PASSENGER IN MOTOR VEHICLE OTHER THAN MOTORCYCLE
E8163	MOTOR VEHICLE TRAFFIC ACCIDENT DUE TO LOSS OF CONTROL, WITHOUT COLLISION ON THE HIGHWAY, INJURING PASSENGER ON MOTORCYCLE
E8164	MOTOR VEHICLE TRAFFIC ACCIDENT DUE TO LOSS OF CONTROL, WITHOUT COLLISION ON THE HIGHWAY, INJURING OCCUPANT OF STREETCAR
E8168	MOTOR VEHICLE TRAFFIC ACCIDENT DUE TO LOSS OF CONTROL, WITHOUT COLLISION ON THE HIGHWAY, INJURING OTHER SPECIFIED PERSON
E8169	MOTOR VEHICLE TRAFFIC ACCIDENT DUE TO LOSS OF CONTROL, WITHOUT COLLISION ON THE HIGHWAY, INJURING UNSPECIFIED PERSON
E8171	NONCOLLISION MOTOR VEHICLE TRAFFIC ACCIDENT WHILE BOARDING OR ALIGHTING INJURING PASSENGER IN MOTOR VEHICLE OTHER THAN MOTORCYCLE
E8179	NONCOLLISION MOTOR VEHICLE TRAFFIC ACCIDENT WHILE BOARDING OR ALIGHTING INJURING UNSPECIFIED PERSON
E8180	OTHER NONCOLLISION MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING PASSENGER IN MOTOR VEHICLE OTHER THAN MOTORCYCLE
E8181	OTHER NONCOLLISION MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING PASSENGER IN MOTOR VEHICLE OTHER THAN MOTORCYCLE
E8182	OTHER NONCOLLISION MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING PASSENGER ON MOTORCYCLE
E8183	OTHER NONCOLLISION MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING PASSENGER ON MOTORCYCLE
E8187	OTHER NONCOLLISION MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING PEDESTRIAN
E8188	OTHER NONCOLLISION MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING OTHER SPECIFIED PERSON
E8189	OTHER NONCOLLISION MOTOR VEHICLE TRAFFIC ACCIDENT INVOLVING UNSPECIFIED PERSON
E8190	MOTOR VEHICLE TRAFFIC ACCIDENT OF UNSPECIFIED NATURE INVOLVING DRIVER OF MOTOR VEHICLE OTHER THAN MOTORCYCLE
E8191	MOTOR VEHICLE TRAFFIC ACCIDENT OF UNSPECIFIED NATURE INVOLVING PASSENGER IN MOTOR VEHICLE OTHER THAN MOTORCYCLE
E8192	MOTOR VEHICLE TRAFFIC ACCIDENT OF UNSPECIFIED NATURE INVOLVING MOTORCYCLIST
E8193	MOTOR VEHICLE TRAFFIC ACCIDENT OF UNSPECIFIED NATURE INVOLVING PASSENGER ON MOTORCYCLE
E8194	MOTOR VEHICLE TRAFFIC ACCIDENT OF UNSPECIFIED NATURE INVOLVING OCCUPANT OF STREETCAR
E8196	MOTOR VEHICLE TRAFFIC ACCIDENT OF UNSPECIFIED NATURE INVOLVING PEDAL CYCLIST
E8197	MOTOR VEHICLE TRAFFIC ACCIDENT OF UNSPECIFIED NATURE INVOLVING PEDESTRIAN
E8198	MOTOR VEHICLE TRAFFIC ACCIDENT OF UNSPECIFIED NATURE INVOLVING OTHER SPECIFIED PERSON
E8199	MOTOR VEHICLE TRAFFIC ACCIDENT OF UNSPECIFIED NATURE INVOLVING UNSPECIFIED PERSON
E8208	NONTRAFFIC ACCIDENT INVOLVING MOTOR-DRIVEN SNOW VEHICLE INVOLVING OTHER SPECIFIED PERSON
E8210	NONTRAFFIC ACCIDENT INVOLVING OTHER OFF-ROAD MOTOR VEHICLE INVOLVING DRIVER OF MOTOR VEHICLE OTHER THAN MOTORCYCLE
E8211	NONTRAFFIC ACCIDENT INVOLVING OTHER OFF-ROAD MOTOR VEHICLE INVOLVING PASSENGER IN MOTOR VEHICLE OTHER THAN MOTORCYCLE
E8212	NONTRAFFIC ACCIDENT INVOLVING OTHER OFF-ROAD MOTOR VEHICLE INVOLVING MOTORCYCLIST
E8217	NONTRAFFIC ACCIDENT INVOLVING OTHER OFF-ROAD MOTOR VEHICLE INVOLVING PEDESTRIAN
E8218	NONTRAFFIC ACCIDENT INVOLVING OTHER OFF-ROAD MOTOR VEHICLE INVOLVING OTHER SPECIFIED PERSON
E8219	NONTRAFFIC ACCIDENT INVOLVING OTHER OFF-ROAD MOTOR VEHICLE INVOLVING UNSPECIFIED PERSON
E8220	OTHER MOTOR VEHICLE NONTRAFFIC ACCIDENT INVOLVING COLLISION WITH MOVING OBJECT INVOLVING DRIVER OF MOTOR VEHICLE OTHER THAN MOTORCYCLE
E8221	OTHER MOTOR VEHICLE NONTRAFFIC ACCIDENT INVOLVING COLLISION WITH MOVING OBJECT INVOLVING PASSENGER IN MOTOR VEHICLE OTHER THAN MOTORCYCLE
E8226	OTHER MOTOR VEHICLE NONTRAFFIC ACCIDENT INVOLVING COLLISION WITH MOVING OBJECT INVOLVING PEDAL CYCLIST
E8227	OTHER MOTOR VEHICLE NONTRAFFIC ACCIDENT INVOLVING COLLISION WITH MOVING OBJECT INVOLVING PEDESTRIAN
E8229	OTHER MOTOR VEHICLE NONTRAFFIC ACCIDENT INVOLVING COLLISION WITH MOVING OBJECT INVOLVING UNSPECIFIED PERSON
E8230	OTHER MOTOR VEHICLE NONTRAFFIC ACCIDENT INVOLVING COLLISION WITH STATIONARY OBJECT INVOLVING DRIVER OF MOTOR VEHICLE OTHER THAN MOTORCYCLE
E8232	OTHER MOTOR VEHICLE NONTRAFFIC ACCIDENT INVOLVING COLLISION WITH STATIONARY OBJECT INVOLVING MOTORCYCLIST
E8249	OTHER MOTOR VEHICLE NONTRAFFIC ACCIDENT WHILE BOARDING AND ALIGHTING INVOLVING UNSPECIFIED PERSON
E8250	OTHER MOTOR VEHICLE NONTRAFFIC ACCIDENT OF OTHER AND UNSPECIFIED NATURE INVOLVING DRIVER OF MOTOR VEHICLE OTHER THAN MOTORCYCLE
E8251	OTHER MOTOR VEHICLE NONTRAFFIC ACCIDENT OF OTHER AND UNSPECIFIED NATURE INVOLVING PASSENGER IN MOTOR VEHICLE OTHER THAN MOTORCYCLE
E8252	OTHER MOTOR VEHICLE NONTRAFFIC ACCIDENT OF OTHER AND UNSPECIFIED NATURE INVOLVING MOTORCYCLIST
E8255	OTHER MOTOR VEHICLE NONTRAFFIC ACCIDENT OF OTHER AND UNSPECIFIED NATURE INVOLVING RIDER OF ANIMAL; OCCUPANT OF ANIMAL-DRAWN VEHICLE
E8257	OTHER MOTOR VEHICLE NONTRAFFIC ACCIDENT OF OTHER AND UNSPECIFIED NATURE INVOLVING PEDESTRIAN
E8259	OTHER MOTOR VEHICLE NONTRAFFIC ACCIDENT OF OTHER AND UNSPECIFIED NATURE INVOLVING UNSPECIFIED PERSON

Table 3-1b  
 Resident Deaths in Motor Vehicle Accidents by Detailed Code for the Underlying Cause of Death as Classified in ICD-10  
 Arizona, 2000-2007

ICD-10 Code	Year of death													
	2000	2001	2002	2003	2004	2005	2006	2007						
V021	1	0	0	0	0	0	0	0	0	0	0	0	0	1
V030	1	4	5	2	3	1	2	3	1	2	2	2	5	
V031	48	52	48	29	27	38	27	27	38	27	27	26		
V039	0	4	1	1	0	0	0	0	0	0	0	0	0	
V040	0	0	0	0	1	2	1	0	2	0	0	0	0	
V041	3	3	6	4	3	2	3	3	2	3	3	1	1	
V049	0	2	0	0	0	0	0	0	0	0	0	0	0	
V090	4	2	4	3	7	9	7	9	9	9	9	9	9	
V092	65	75	83	85	102	130	102	128	130	128	113	113		
V129	0	1	0	0	0	0	0	0	0	0	0	0	0	
V130	0	0	0	0	0	0	0	0	0	0	1	0	0	
V131	0	1	0	0	0	0	0	0	0	0	0	0	0	
V132	0	0	0	0	0	0	0	0	0	0	0	0	1	
V134	3	4	0	2	1	8	1	3	8	3	3	0	0	
V135	0	1	0	0	0	0	0	0	0	0	0	0	0	
V139	10	9	5	5	3	7	3	8	7	8	8	4	4	
V149	0	1	0	0	1	2	1	2	2	1	0	1	1	
V190	0	1	0	0	0	0	0	0	0	0	0	0	0	
V192	0	0	0	0	1	0	1	0	0	0	0	0	0	
V194	1	2	0	0	5	14	5	9	14	9	9	3	3	
V195	0	0	0	0	1	0	1	0	0	0	0	0	0	
V196	6	6	3	7	9	8	9	9	8	9	9	9	9	
V204	0	0	0	0	1	0	1	0	0	0	0	0	0	
V209	1	0	0	0	0	0	0	0	0	0	0	0	0	
V224	2	0	0	1	0	0	0	1	0	0	1	2	2	
V225	0	0	0	0	0	0	0	0	0	0	1	0	0	
V229	0	0	0	0	1	0	1	0	0	0	0	0	0	
V230	0	0	0	0	0	0	0	0	0	0	0	1	1	
V234	7	10	7	11	4	8	4	10	8	10	10	2	2	
V235	1	0	1	0	0	0	0	0	0	0	0	0	0	
V239	5	4	4	6	2	0	2	2	0	2	2	1	1	
V244	0	0	0	0	0	1	0	0	1	0	0	0	0	
V254	0	0	0	0	0	0	0	0	0	0	1	0	0	
V255	0	0	0	0	0	0	0	1	0	0	1	0	0	
V272	0	0	0	0	0	0	0	0	0	0	0	1	1	
V274	2	1	1	2	3	10	3	3	10	3	3	1	1	
V275	1	0	0	0	1	0	1	0	0	0	0	0	0	
V279	1	0	1	0	1	0	1	0	0	0	0	0	0	
V280	0	1	0	1	1	0	1	0	1	0	0	0	0	
V281	1	0	0	0	0	0	0	0	0	0	0	0	0	
V284	2	2	2	6	1	6	1	6	6	6	6	5	5	

Table 3-1b (continued)  
 Resident Deaths in Motor Vehicle Accidents by Detailed Code for the Underlying Cause of Death as Classified in ICD-10  
 Arizona, 2000-2007

ICD-10 Code	Year of death										
	2000	2001	2002	2003	2004	2005	2006	2007			
V285	3	0	0	0	1	2	0	0	0	0	0
V289	0	1	0	5	0	0	1	0	1	0	1
V290	1	1	0	0	0	0	0	0	0	0	0
V293	0	2	1	1	0	0	4	0	0	0	8
V294	11	15	11	6	26	10	8	6	8	6	6
V295	1	1	2	1	1	1	0	0	0	0	0
V296	6	0	5	3	2	0	3	1	3	0	1
V299	26	25	45	33	44	76	73	74	73	74	74
V393	1	0	0	0	0	0	0	0	0	0	0
V405	0	0	0	0	0	0	0	0	0	0	1
V406	0	0	1	0	0	0	0	0	0	0	0
V429	0	0	0	0	1	0	0	0	0	0	0
V430	2	0	0	0	0	0	0	0	0	0	1
V431	0	0	0	0	0	0	0	0	0	0	1
V435	18	20	11	7	10	10	9	4	9	4	4
V436	17	11	7	1	8	8	1	8	1	8	8
V439	12	6	7	15	12	10	4	4	0	0	0
V445	2	0	0	0	0	1	0	1	1	0	0
V446	1	0	0	0	0	1	0	0	0	0	0
V449	0	2	0	1	0	0	0	0	0	0	0
V450	1	0	0	0	0	0	0	0	0	0	0
V455	0	0	0	0	0	0	0	0	0	0	0
V456	1	0	0	0	0	0	0	0	0	0	0
V459	0	0	0	3	0	0	0	0	0	0	0
V465	0	0	1	0	0	0	0	0	0	0	0
V466	0	0	0	1	0	0	0	0	0	0	0
V470	0	0	0	0	0	0	1	0	0	0	0
V475	2	3	4	3	4	0	1	2	1	2	2
V476	3	1	1	2	3	1	0	1	0	1	1
V479	1	1	0	5	2	2	0	0	0	0	3
V480	0	0	0	1	0	0	0	0	0	0	0
V484	0	0	1	0	0	0	0	0	0	0	0
V485	16	8	15	17	9	12	13	10	13	10	10
V486	11	14	5	9	10	6	8	10	8	10	10
V489	10	2	8	16	15	5	3	6	3	6	6
V49	0	0	0	0	1	0	0	0	0	0	0
V490	0	0	1	1	0	0	0	0	0	0	0
V491	0	0	0	1	0	0	0	0	0	0	0
V493	0	0	0	1	0	0	1	0	1	0	4
V494	4	3	0	2	5	0	3	5	0	3	5
V495	3	4	7	4	3	0	0	3	0	0	3

Table 3-1b (continued)  
 Resident Deaths in Motor Vehicle Accidents by Detailed Code for the Underlying Cause of Death as Classified in ICD-10  
 Arizona, 2000-2007

ICD-10 Code	Year of death									
	2000	2001	2002	2003	2004	2005	2006	2007		
V496	5	4	5	0	0	0	0	0	0	1
V498	1	0	0	0	0	0	0	0	0	0
V499	18	15	24	22	16	13	18	7		
V505	0	0	0	0	0	0	0	0	0	0
V535	5	0	0	2	1	4	2	0		
V536	0	0	2	1	1	0	0	0		
V539	0	0	0	0	1	0	0	0		
V545	0	0	0	2	0	1	0	0		
V546	0	0	1	1	1	0	0	0		
V549	0	1	0	0	0	0	0	0		
V556	0	1	0	0	0	0	0	0		
V559	0	0	0	1	0	0	0	0		
V575	0	0	0	2	0	1	0	0		
V579	0	0	0	0	0	0	0	0		
V581	3	0	0	1	0	0	0	0		
V583	0	0	0	1	0	0	0	0		
V585	3	1	2	4	4	4	3	1		
V586	2	0	3	0	1	3	6	3		
V589	2	5	2	0	4	0	1	1		
V593	0	0	0	0	0	0	0	0		
V594	1	0	1	1	1	0	0	0		
V595	4	0	0	2	1	0	0	0		
V596	0	1	0	0	0	0	0	0		
V599	5	5	6	0	0	4	3	2		
V635	0	0	1	0	0	0	0	0		
V639	0	0	0	1	0	0	0	0		
V645	1	0	0	1	0	0	0	0		
V682	1	0	0	0	0	0	0	0		
V685	2	0	1	2	1	0	0	0		
V689	0	0	0	0	0	1	0	0		
V694	0	1	0	0	0	0	0	0		
V698	1	0	0	0	0	0	0	0		
V699	0	1	1	0	1	0	0	0		
V793	0	0	0	0	1	0	0	0		
V796	1	0	0	0	0	0	0	0		
V798	0	0	0	0	0	0	1	0		
V811	0	1	0	0	0	0	0	0		
V839	0	0	0	1	0	0	0	0		
V840	0	0	1	0	0	2	0	0		
V845	0	0	0	0	0	1	0	0		
V849	0	0	0	0	0	0	1	1		

Table 3-1b (continued)  
 Resident Deaths in Motor Vehicle Accidents by Detailed Code for the Underlying Cause of Death as Classified in ICD-10  
 Arizona, 2000-2007

ICD-10 Code	Year of death									
	2000	2001	2002	2003	2004	2005	2006	2007		
V850	1	0	0	0	1	0	0	0	0	0
V855	0	0	1	0	0	0	0	0	0	0
V859	0	0	0	0	0	2	0	0	0	0
V860	5	0	0	3	5	5	7	4		
V861	0	0	0	0	0	1	1	1		
V863	3	1	3	1	3	2	2	2		
V865	4	2	3	3	8	6	8	15		
V866	0	1	0	0	0	1	1	3		
V869	2	4	11	5	7	10	14	11		
V870	0	2	1	2	4	7	5	5		
V871	1	1	1	3	5	12	4	2		
V872	1	1	2	6	1	3	2	6		
V874	1	2	1	0	1	2	0	0		
V875	0	0	1	0	0	0	0	0		
V876	1	0	0	1	0	0	0	0		
V877	85	105	100	115	113	136	132	45		
V878	2	3	2	2	0	0	1	0		
V887	0	0	1	0	0	0	1	1		
V890	1	2	1	9	13	4	13	24		
V892	416	445	522	506	529	517	632	560		
Total	896	908	1003	1005	1060	1137	1220	1035		

## Detailed Code Description for the Underlying Cause of Death as Classified in ICD-10 for Motor Vehicle Accidents

### Pedestrian injured in transport accident (V01-V09)

**Excludes:** collision of pedestrian (conveyance) with other pedestrian; (conveyance) (W51.-); with subsequent fall (W03.-)  
The following fourth-character subdivision are for use with categories V01-V09:

- .0 Nontraffic accident
- .1 Traffic accident
- .9 Unspecified whether traffic or nontraffic accident

ICD-10 CODE	CODE DESCRIPTION
V02	PEDESTRIAN INJURED IN COLLISION WITH TWO- OR THREE-WHEELED MOTOR VEHICLE
V03	PEDESTRIAN INJURED IN COLLISION WITH CAR, PICK-UP TRUCK OR VAN
V04	PEDESTRIAN INJURED IN COLLISION WITH HEAVY TRANSPORT VEHICLE OR BUS
V09	PEDESTRIAN INJURED IN OTHER AND UNSPECIFIED TRANSPORT ACCIDENTS (INCLUDES: PEDESTRIAN INJURED BY SPECIAL VEHICLE)
V09.2	PEDESTRIAN INJURED IN TRAFFIC ACCIDENT INVOLVING OTHER AND UNSPECIFIED MOTOR VEHICLES

### Pedal cyclist injured in transport accident (V10-V19)

The following fourth-character subdivisions are for use with categories V10-V18:

- .0 Driver injured in nontraffic accident
- .1 Passenger injured in nontraffic accident
- .2 Unspecified pedal cyclist injured in nontraffic accident
- .3 Person injured while boarding or alighting
- .4 Driver injured in traffic accident
- .5 Passenger injured in traffic accident
- .9 Unspecified pedal cyclist injured in traffic accident

ICD-10 CODE	CODE DESCRIPTION
V12	PEDAL CYCLIST INJURED IN COLLISION WITH TWO- OR THREE-WHEELED MOTOR VEHICLE
V13	PEDAL CYCLIST INJURED IN COLLISION WITH CAR, PICK-UP TRUCK OR VAN
V14	PEDAL CYCLIST INJURED IN COLLISION WITH HEAVY TRANSPORT VEHICLE OR BUS
V19	PEDAL CYCLIST INJURED IN OTHER AND UNSPECIFIED TRANSPORT ACCIDENTS
V19.6	UNSPECIFIED PEDAL CYCLIST INJURED IN COLLISION WITH OTHER AND UNSPECIFIED MOTOR VEHICLES IN TRAFFIC ACCIDENT (PEDAL CYCLE COLLISION NOS (TRAFFIC))

### Motorcycle rider injured in transport accident (V20-V29)

**Includes:** moped, motorcycle with sidecar, motorized bicycle, motor scooter

**Excludes:** three-wheeled motor vehicle (V30-V39)

The following fourth-character subdivisions are for use with categories V20-V28:

- .0 Driver injured in nontraffic accident
- .1 Passenger injured in nontraffic accident
- .2 Unspecified motorcycle rider injured in nontraffic accident
- .3 Person injured while boarding or alighting
- .4 Driver injured in traffic accident
- .5 Passenger injured in traffic accident
- .9 Unspecified motorcycle rider injured in traffic accident

ICD-10 CODE	CODE DESCRIPTION
V20	MOTORCYCLE RIDER INJURED IN COLLISION WITH PEDESTRIAN OR ANIMAL (EXCLUDES: COLLISION WITH ANIMAL-DRAWN VEHICLE OR ANIMAL BEING RIDDEN (V26.-))
V22	MOTORCYCLE RIDER INJURED IN COLLISION WITH TWO- OR THREE-WHEELED MOTOR VEHICLE
V23	MOTORCYCLE RIDER INJURED IN COLLISION WITH CAR, PICK-UP TRUCK OR VAN
V24	MOTORCYCLE RIDER INJURED IN COLLISION WITH HEAVY TRANSPORT VEHICLE OR BUS

**Motorcycle rider injured in transport accident (V20-V29) (continued)**

ICD-10 CODE	CODE DESCRIPTION
V25	MOTORCYCLE RIDER INJURED IN COLLISION WITH RAILWAY TRAIN OR RAILWAY VEHICLE
V27	MOTORCYCLE RIDER INJURED IN COLLISION WITH FIXED OR STATIONARY OBJECT
V28	MOTORCYCLE RIDER INJURED IN NONCOLLISION TRANSPORT ACCIDENT (INCLUDES: FALL OR THROWN FROM MOTORCYCLE (WITHOUT ANTECEDENT COLLISION), OVERTURNING, NOS, WITHOUT COLLISION)
V29	MOTORCYCLE RIDER INJURED IN OTHER AND UNSPECIFIED TRANSPORT ACCIDENTS
V29.6	UNSPECIFIED MOTORCYCLE RIDER INJURED IN COLLISION WITH OTHER AND UNSPECIFIED MOTOR VEHICLES IN TRAFFIC ACCIDENT (MOTORCYCLE COLLISION NOS (TRAFFIC))

**Occupant of three-wheeled motor vehicle injured in transport accident (V30-V39)**

**Includes:** motorized tricycle

**Excludes:** motorcycle with sidecar (V20-V29), vehicle designed primarily for off-road use (V86.-)

The following fourth-character subdivisions are for use with categories V30-V38:

- .0 Driver injured in nontraffic accident
- .1 Passenger injured in nontraffic accident
- .2 Person on outside of vehicle injured in nontraffic accident
- .3 Unspecified occupant of three-wheeled motor vehicle injured in nontraffic accident
- .4 Person injured while boarding or alighting
- .5 Driver injured in traffic accident
- .6 Passenger injured in traffic accident
- .7 Person on outside of vehicle injured in traffic accident
- .9 Unspecified occupant of three-wheeled motor vehicle injured in traffic accident

ICD-10 CODE	CODE DESCRIPTION
V39	OCCUPANT OF THREE-WHEELED MOTOR VEHICLE INJURED IN NONCOLLISION TRANSPORT ACCIDENT (INCLUDES: FALL OR THROWN FROM THREE-WHEELED MOTOR VEHICLE OVERTURNING: NOS, WITHOUT COLLISION)

**Car occupant injured in transport accident (V40-V49)**

**Includes:** minibus

The following fourth-character subdivisions are for use with categories V40-V48:

- .0 Driver injured in nontraffic accident
- .1 Passenger injured in nontraffic accident
- .2 Person on outside of vehicle injured in nontraffic accident
- .3 Unspecified car occupant injured in nontraffic accident
- .4 Person injured while boarding or alighting
- .5 Driver injured in traffic accident
- .6 Passenger injured in traffic accident
- .7 Person on outside of vehicle injured in traffic accident
- .9 Unspecified car occupant injured in traffic accident

ICD-10 CODE	CODE DESCRIPTION
V40	CAR OCCUPANT INJURED IN COLLISION WITH PEDESTRIAN OR ANIMAL (EXCLUDES: COLLISION WITH ANIMAL-DRAWN VEHICLE OR ANIMAL BEING RIDDEN (V46.-))
V42	CAR OCCUPANT INJURED IN COLLISION WITH TWO- OR THREE-WHEELED MOTOR VEHICLE
V43	CAR OCCUPANT INJURED IN COLLISION WITH CAR, PICK-UP TRUCK OR VAN
V44	CAR OCCUPANT INJURED IN COLLISION WITH HEAVY TRANSPORT VEHICLE OR BUS
V45	CAR OCCUPANT INJURED IN COLLISION WITH RAILWAY TRAIN OR RAILWAY VEHICLE
V46	CAR OCCUPANT INJURED IN COLLISION WITH OTHER NONMOTOR VEHICLE (INCLUDES: COLLISION WITH ANIMAL-DRAWN VEHICLE, ANIMAL BEING RIDDEN, STREETCAR)
V47	CAR OCCUPANT INJURED IN COLLISION WITH FIXED OR STATIONARY OBJECT
V48	CAR OCCUPANT INJURED IN NONCOLLISION TRANSPORT ACCIDENT (INCLUDES: OVERTURNING: NOS, WITHOUT COLLISION)
V49	CAR OCCUPANT INJURED IN OTHER AND UNSPECIFIED TRANSPORT ACCIDENTS
V49.8	CAR OCCUPANT (ANY) INJURED IN OTHER SPECIFIED TRANSPORT ACCIDENTS (TRAPPED BY DOOR OR OTHER PART CAR)



**Occupant of pick-up truck or van injured in transport accident (V50-V59)**

**Excludes:** heavy transport vehicle (V60-V69)

The following fourth-character subdivisions are for use with categories V50-V58:

- .0 Driver injured in nontraffic accident
- .1 Passenger injured in nontraffic accident
- .2 Person on outside of vehicle injured in nontraffic accident
- .3 Unspecified occupant of pick-up truck or van injured in nontraffic accident
- .4 Person injured while boarding or alighting
- .5 Driver injured in traffic accident
- .6 Passenger injured in traffic accident
- .7 Person on outside of vehicle injured in traffic accident
- .9 Unspecified occupant of pick-up truck or van injured in traffic accident

ICD-10 CODE	CODE DESCRIPTION
V50	OCCUPANT OF PICK-UP TRUCK OR VAN INJURED IN COLLISION WITH PEDESTRIAN OR ANIMAL (EXCLUDES: COLLISION WITH ANIMAL-DRAWN VEHICLE OR ANIMAL BEING RIDDEN (V56.-))
V53	OCCUPANT OF PICK-UP TRUCK OR VAN INJURED IN COLLISION WITH CAR, PICK-UP TRUCK OR VAN
V54	OCCUPANT OF PICK-UP TRUCK OR VAN INJURED IN COLLISION WITH HEAVY TRANSPORT VEHICLE OR BUS
V55	OCCUPANT OF PICK-UP TRUCK OR VAN INJURED IN COLLISION WITH RAILWAY TRAIN OR RAILWAY VEHICLE
V57	OCCUPANT OF PICK-UP TRUCK OR VAN INJURED IN COLLISION WITH FIXED OR STATIONARY OBJECT
V58	OCCUPANT OF PICK-UP TRUCK OR VAN INJURED IN NONCOLLISION TRANSPORT ACCIDENT (INCLUDES: OVERTURNING: NOS, WITHOUT COLLISION)
V59	OCCUPANT OF PICK-UP TRUCK OR VAN INJURED IN OTHER AND UNSPECIFIED TRANSPORT ACCIDENTS

**Occupant of heavy transport vehicle injured in transport accident (V60-V69)**

The following fourth-character subdivisions are for use with categories V60-V68:

- .0 Driver injured in nontraffic accident
- .1 Passenger injured in nontraffic accident
- .2 Person on outside of vehicle injured in nontraffic accident
- .3 Unspecified occupant of heavy transport vehicle injured in nontraffic accident
- .4 Person injured while boarding or alighting
- .5 Driver injured in traffic accident
- .6 Passenger injured in traffic accident
- .7 Person on outside of vehicle injured in traffic accident
- .9 Unspecified occupant of heavy transport vehicle injured in traffic accident

ICD-10 CODE	CODE DESCRIPTION
V63	OCCUPANT OF HEAVY TRANSPORT VEHICLE INJURED IN COLLISION WITH CAR, PICK-UP TRUCK OR VAN
V64	OCCUPANT OF HEAVY TRANSPORT VEHICLE INJURED IN COLLISION WITH HEAVY TRANSPORT VEHICLE OR BUS
V68	OCCUPANT OF HEAVY TRANSPORT VEHICLE INJURED IN NONCOLLISION TRANSPORT ACCIDENT (INCLUDES: OVERTURNING: NOS, WITHOUT COLLISION)
V69	OCCUPANT OF HEAVY TRANSPORT VEHICLE INJURED IN OTHER AND UNSPECIFIED TRANSPORT ACCIDENTS
V69.8	OCCUPANT (ANY) OF HEAVY TRANSPORT VEHICLE INJURED IN OTHER SPECIFIED TRANSPORT ACCIDENTS (TRAPPED BY DOOR OR OTHER PART OF HEAVY TRANSPORT VEHICLE)

**Bus occupant injured in transport accident (V70-V79)**

**Excludes: minibus (V40-V49)**

The following fourth-character subdivisions are for use with categories V70-V78:

- .0 Driver injured in nontraffic accident
- .1 Passenger injured in nontraffic accident
- .2 Person on outside of vehicle injured in nontraffic accident
- .3 Unspecified bus occupant injured in nontraffic accident
- .4 Person injured while boarding or alighting
- .5 Driver injured in traffic accident
- .6 Passenger injured in traffic accident

**Bus occupant injured in transport accident (V70-V79) (continued)**

**Excludes: minibus (V40-V49)**

The following fourth-character subdivisions are for use with categories V70-V78:

- .7 Person on outside of vehicle injured in traffic accident
- .9 Unspecified bus occupant injured in traffic accident

ICD-10 CODE	CODE DESCRIPTION
V79.8	BUS OCCUPANT (ANY) INJURED IN OTHER SPECIFIED TRANSPORT ACCIDENTS (TRAPPED BY DOOR OR OTHER PART OF BUS)

**Other land transport accidents (V80-V89)**

ICD-10 CODE	CODE DESCRIPTION
V81.1	OCCUPANT OF RAILWAY TRAIN OR RAILWAY VEHICLE INJURED IN COLLISION WITH MOTOR VEHICLE IN TRAFFIC ACCIDENT
V83.9	UNSPECIFIED OCCUPANT OF SPECIAL INDUSTRIAL VEHICLE INJURED IN NONTRAFFIC ACCIDENT (SPECIAL-INDUSTRIAL VEHICLE ACCIDENT NOS)
V84.0	DRIVER OF SPECIAL AGRICULTURAL VEHICLE INJURED IN TRAFFIC ACCIDENT
V84.5	DRIVER OF SPECIAL AGRICULTURAL VEHICLE INJURED IN NONTRAFFIC ACCIDENT
V84.9	UNSPECIFIED OCCUPANT OF SPECIAL AGRICULTURAL VEHICLE INJURED IN NONTRAFFIC ACCIDENT (SPECIAL-AGRICULTURAL VEHICLE ACCIDENT NOS)
V85.0	DRIVER OF SPECIAL CONSTRUCTION VEHICLE INJURED IN TRAFFIC ACCIDENT
V85.5	DRIVER OF SPECIAL CONSTRUCTION VEHICLE INJURED IN NONTRAFFIC ACCIDENT
V85.9	UNSPECIFIED OCCUPANT OF SPECIAL CONSTRUCTION VEHICLE INJURED IN NONTRAFFIC ACCIDENT (SPECIAL-CONSTRUCTION-VEHICLE ACCIDENT NOS)
V86.0	DRIVER OF ALL-TERRAIN OR OTHER OFF-ROAD MOTOR VEHICLE INJURED IN TRAFFIC ACCIDENT
V86.1	PASSENGER OF ALL-TERRAIN OR OTHER OFF-ROAD MOTOR VEHICLE INJURED IN TRAFFIC ACCIDENT
V86.3	UNSPECIFIED OCCUPANT OF ALL-TERRAIN OR OTHER OFF-ROAD MOTOR VEHICLE INJURED IN TRAFFIC ACCIDENT
V86.5	DRIVER OF ALL-TERRAIN OR OTHER OFF-ROAD MOTOR VEHICLE INJURED IN NONTRAFFIC ACCIDENT
V86.6	PASSENGER OF ALL-TERRAIN OR OTHER OFF-ROAD MOTOR VEHICLE INJURED IN NONTRAFFIC ACCIDENT
V86.9	UNSPECIFIED OCCUPANT OF ALL-TERRAIN OR OTHER OFF-ROAD MOTOR VEHICLE INJURED IN NONTRAFFIC ACCIDENT (ALL-TERRAIN MOTOR VEHICLE ACCIDENT NOS, OFF-ROAD MOTOR VEHICLE ACCIDENT NOS)
V87.0	PERSON INJURED IN COLLISION BETWEEN CAR AND TWO- OR THREE-WHEELED MOTOR VEHICLE (TRAFFIC)
V87.1	PERSON INJURED IN COLLISION BETWEEN OTHER MOTOR VEHICLE AND TWO- OR THREE-WHEELED MOTOR VEHICLE (TRAFFIC)
V87.2	PERSON INJURED IN COLLISION BETWEEN CAR AND PICK-UP TRUCK OR VAN (TRAFFIC)
V87.4	PERSON INJURED IN COLLISION BETWEEN CAR AND HEAVY TRANSPORT VEHICLE (TRAFFIC)
V87.5	PERSON INJURED IN COLLISION BETWEEN CAR AND HEAVY TRANSPORT VEHICLE AND BUS (TRAFFIC)
V87.7	PERSON INJURED IN COLLISION BETWEEN OTHER SPECIFIED MOTOR VEHICLES (TRAFFIC)
V87.8	PERSON INJURED IN OTHER SPECIFIED NONCOLLISION TRANSPORT ACCIDENTS INVOLVING MOTOR VEHICLE (TRAFFIC)
V88.7	PERSON INJURED IN COLLISION BETWEEN OTHER SPECIFIED MOTOR VEHICLES, NONTRAFFIC
V89.0	PERSON INJURED IN UNSPECIFIED MOTOR-VEHICLE ACCIDENT, NONTRAFFIC (MOTOR-VEHICLE ACCIDENT NOS, NONTRAFFIC)
V89.2	PERSON INJURED IN UNSPECIFIED MOTOR-VEHICLE ACCIDENT, TRAFFIC (MOTOR-VEHICLE ACCIDENT (MVA) NOS) (ROAD (TRAFFIC) ACCIDENT (RTA) NOS)

**Table 3-2  
Number of Deaths from Motor Vehicle-Related Injuries by Person Injured, Gender and Year  
Arizona Residents, 1993-2007**

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
<b>TOTAL</b>															
Total	817	897	1,023	1,051	972	1,001	980	896	908	1,003	1,005	1,060	1,137	1,220	1,035
Male	553	624	698	729	666	664	680	617	638	684	689	693	801	831	710
Female	264	273	325	322	306	337	300	279	270	319	316	367	336	389	325
<b>Motorcyclist</b>															
Total	41	43	45	55	44	43	68	71	61	81	76	89	113	115	103
Male	36	38	41	47	40	40	60	62	54	75	68	72	101	99	92
Female	5	5	4	8	4	3	8	9	7	6	8	17	12	16	11
<b>Pedestrian</b>															
Total	164	150	180	185	183	181	162	122	142	147	124	143	182	169	155
Male	120	110	134	127	134	129	131	97	101	103	88	99	141	123	103
Female	44	40	46	58	49	52	31	25	41	44	36	44	41	46	52
<b>Pedal cyclist</b>															
Total	17	21	29	28	36	21	23	20	26	8	14	21	39	30	18
Male	15	19	24	25	34	19	22	18	25	8	12	18	36	29	17
Female	2	2	5	3	2	2	1	2	1	0	2	3	3	1	1
<b>Other person (incl. drivers and passengers of motor vehicles other than motorcycles)</b>															
Total	595	683	769	783	709	756	727	683	679	767	791	807	810	918	766
Male	382	457	499	530	458	476	467	440	458	498	521	504	527	591	503
Female	213	226	270	253	251	280	260	243	221	269	270	303	283	327	263

Note: Beginning in 2000, the data are classified by the Tenth Revision of the International Classification of Diseases (ICD-10), replacing the Ninth Revision (ICD-9) used in Arizona during 1979-1999. The comparability ratio for motor vehicle accidents is 0.85, a decrease by 15 percent due to ICD-10. Since the implementation of ICD-10 in Arizona it is no longer possible to distinguish the deaths of drivers (M.V. driver) from passengers (M.V. passenger) of motor vehicles because the "victim's mode of transport" is unknown for the absolute majority of motor vehicle-related deaths (62.1 percent in 2007, or 643 out of 1,035 motor vehicle-related deaths). For comparison, M.V. drivers accounted for approximately 30 percent of all motor vehicle-related fatalities in 1993-1999 (see below).

<b>M.V. driver</b>															
Total	203	269	274	276	317	341	324	NA	NA	NA	NA	NA	NA	NA	NA
Male	131	198	198	200	230	229	217	NA	NA	NA	NA	NA	NA	NA	NA
Female	72	71	76	76	87	112	107	NA	NA	NA	NA	NA	NA	NA	NA
<b>M.V. passenger</b>															
Total	152	174	175	199	204	226	207	NA	NA	NA	NA	NA	NA	NA	NA
Male	82	98	90	115	95	121	109	NA	NA	NA	NA	NA	NA	NA	NA
Female	70	76	85	84	109	105	98	NA	NA	NA	NA	NA	NA	NA	NA
<b>Other</b>															
Total	240	240	320	308	188	189	196	683	679	767	791	807	810	918	766
Male	169	161	211	215	133	126	141	440	458	498	521	504	527	591	503
Female	71	79	109	93	55	63	55	243	221	269	270	303	283	327	263

**Table 3-3  
Types of Victims of Motor Vehicle Accidents:  
Percent Distribution by Age Group and Gender, Arizona Residents, 1993-2007**

	<15		15-19		20-44		45-64		65+		Unknown		Total	
	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %
<b>Male</b>														
Motorcycle rider	12	2.0%	66	6.0%	543	10.6%	279	13.0%	25	1.9%	0	0.0%	925	9.0%
Pedestrian	174	29.4%	85	7.7%	739	14.5%	475	22.2%	243	18.8%	24	68.6%	1,740	16.9%
Pedal cyclist	49	8.3%	23	2.1%	127	2.5%	85	4.0%	37	2.9%	0	0.0%	321	3.1%
Other person	356	60.2%	927	84.2%	3,704	72.4%	1,305	60.9%	988	76.4%	11	31.4%	7,291	70.9%
<b>Total</b>	591	100.0%	1,101	100.0%	5,113	100.0%	2,144	100.0%	1,293	100.0%	35	100.0%	10,277	100.0%
<b>Female</b>														
Motorcycle rider	2	0.5%	9	1.7%	74	4.1%	33	3.5%	5	0.5%	0	0.0%	123	2.6%
Pedestrian	119	27.9%	36	6.8%	214	11.8%	136	14.5%	143	14.2%	1	50.0%	649	13.7%
Pedal cyclist	8	1.9%	4	0.8%	11	0.6%	6	0.6%	1	0.1%	0	0.0%	30	0.6%
Other person	298	69.8%	483	90.8%	1,522	83.6%	764	81.4%	858	85.2%	1	50.0%	3,926	83.0%
<b>Total</b>	427	100.0%	532	100.0%	1,821	100.0%	939	100.0%	1,007	100.0%	2	100.0%	4,728	100.0%
<b>Total</b>														
Motorcycle rider	14	1.4%	75	4.6%	617	8.9%	312	10.1%	30	1.3%	0	0.0%	1,048	7.0%
Pedestrian	293	28.8%	121	7.4%	953	13.7%	611	19.8%	386	16.8%	25	67.6%	2,389	15.9%
Pedal cyclist	57	5.6%	27	1.7%	138	2.0%	91	3.0%	38	1.7%	0	0.0%	351	2.3%
Other person	654	64.2%	1,410	86.3%	5,226	75.4%	2,069	67.1%	1,846	80.3%	12	32.4%	11,217	74.8%
<b>Total</b>	1,018	100.0%	1,633	100.0%	6,934	100.0%	3,083	100.0%	2,300	100.0%	37	100.0%	15,005	100.0%

**Table 3-4  
Types of Victims of Motor Vehicle Accidents:  
Percent Distribution by Race/Ethnicity and Gender, Arizona Residents, 1993-2007**

	White non-Hispanic		Hispanic or Latino		Black or African American		American Indian or Alaska Native		Asian or Pacific Islander		Other/Unknown		Total		
	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	
<b>Male</b>	Motorcycle rider	769	14.0%	100	3.8%	29	9.0%	19	1.1%	7	7.9%	1	3.1%	925	9.0%
	Pedestrian	720	13.1%	444	17.0%	59	18.2%	498	28.7%	7	7.9%	12	37.5%	1,740	16.9%
	Pedal cyclist	207	3.8%	76	2.9%	18	5.6%	13	0.7%	7	7.9%	0	0.0%	321	3.1%
	Other person	3,785	69.1%	1,994	76.3%	218	67.3%	1,207	69.5%	68	76.4%	19	59.4%	7,291	70.9%
	<b>Total</b>	5,481	100.0%	2,614	100.0%	324	100.0%	1,737	100.0%	89	100.0%	32	100.0%	10,277	100.0%
<b>Female</b>	Motorcycle rider	105	3.9%	10	1.0%	3	2.5%	4	0.5%	0	0.0%	1	12.5%	123	2.6%
	Pedestrian	321	11.8%	162	16.0%	24	20.0%	123	15.5%	17	23.9%	2	25.0%	649	13.7%
	Pedal cyclist	19	0.7%	7	0.7%	2	1.7%	2	0.3%	0	0.0%	0	0.0%	30	0.6%
	Other person	2,278	83.7%	834	82.3%	91	75.8%	664	83.7%	54	76.1%	5	62.5%	3,926	83.0%
	<b>Total</b>	2,723	100.0%	1,013	100.0%	120	100.0%	793	100.0%	71	100.0%	8	100.0%	4,728	100.0%
<b>Total</b>	Motorcycle rider	874	10.7%	110	3.0%	32	7.2%	23	0.9%	7	4.4%	2	5.0%	1,048	7.0%
	Pedestrian	1,041	12.7%	606	16.7%	83	18.7%	621	24.5%	24	15.0%	14	35.0%	2,389	15.9%
	Pedal cyclist	226	2.8%	83	2.3%	20	4.5%	15	0.6%	7	4.4%	0	0.0%	351	2.3%
	Other person	6,063	73.9%	2,828	78.0%	309	69.6%	1,871	74.0%	122	76.3%	24	60.0%	11,217	74.8%
	<b>Total</b>	8,204	100.0%	3,627	100.0%	444	100.0%	2,530	100.0%	160	100.0%	40	100.0%	15,005	100.0%

Table 3-5  
Types of Victims of Motor Vehicle Accidents:  
Percent Distribution by County of Residence and Gender, Arizona Residents, 1993-2007

	Male						Female						Total									
	Motorcycle rider	Pedestrian	Pedal cyclist	Other person	Total		Motorcycle rider	Pedestrian	Pedal cyclist	Other person	Total		Motorcycle rider	Pedestrian	Pedal cyclist	Other person	Total					
	Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count	Row %				
<b>Apache</b>	8	1.7%	137	29.1%	1	0.2%	324	68.9%	470	100.0%	2	36	0	172	210	10	173	1	496	680	100.0%	
<b>Cochise</b>	31	12.3%	24	9.5%	5	2.0%	193	76.3%	253	100.0%	3	11	0	117	131	34	35	5	310	384	100.0%	
<b>Coconino</b>	14	3.4%	95	23.4%	5	1.2%	292	71.9%	406	100.0%	4	21	2	149	176	18	116	7	441	582	100.0%	
<b>Gila</b>	12	6.5%	22	12.0%	0	0.0%	150	81.5%	184	100.0%	3	6	0	61	70	15	28	0	211	254	100.0%	
<b>Graham</b>	2	1.8%	22	19.3%	2	1.8%	88	77.2%	114	100.0%	2	10	1	32	45	4	32	3	120	159	100.0%	
<b>Greenlee</b>	0	0.0%	1	11.1%	0	0.0%	8	88.9%	9	100.0%	0	1	0	7	8	0	2	0	15	17	100.0%	
<b>Maricopa</b>	513	10.2%	862	17.1%	215	4.3%	3,461	68.5%	5,051	100.0%	60	348	18	1,808	2,234	573	1,210	233	5,269	7,285	100.0%	
<b>Mohave</b>	29	7.8%	53	14.2%	6	1.6%	284	76.3%	372	100.0%	2	16	0	157	175	31	69	6	441	547	100.0%	
<b>Navajo</b>	10	1.9%	121	23.0%	3	0.6%	393	74.6%	527	100.0%	3	24	0	205	232	13	145	3	598	759	100.0%	
<b>Pima</b>	173	13.1%	240	18.1%	46	3.5%	864	65.3%	1,323	100.0%	25	115	5	567	712	198	355	51	1,431	2,035	100.0%	
<b>Pinal</b>	47	8.3%	61	10.8%	9	1.6%	450	79.4%	567	100.0%	5	23	1	243	272	52	84	10	693	839	100.0%	
<b>Santa Cruz</b>	6	9.0%	6	9.0%	0	0.0%	55	82.1%	67	100.0%	1	2	0	19	22	7	8	0	74	89	100.0%	
<b>Yavapai</b>	42	11.0%	28	7.3%	8	2.1%	303	79.5%	381	100.0%	9	11	0	188	208	51	39	8	491	589	100.0%	
<b>Yuma</b>	15	5.7%	36	13.8%	14	5.4%	196	75.1%	261	100.0%	1	13	1	89	104	16	49	15	285	365	100.0%	
<b>La Paz</b>	5	6.1%	8	9.8%	1	1.2%	68	82.9%	82	100.0%	1	3	0	35	39	6	11	1	103	121	100.0%	
<b>Unknown</b>	18	8.6%	24	11.4%	6	2.9%	162	77.1%	210	100.0%	2	9	2	77	90	20	33	8	239	300	100.0%	
<b>Total</b>	925	9.0%	1,740	16.9%	321	3.1%	7,291	70.9%	10,277	100.0%	123	649	30	3,926	4,728	1,048	2,389	351	11,217	15,005	100.0%	

**4.  
EMERGENCY ROOM VISITS AND INPATIENT  
DISCHARGES WITH MOTOR VEHICLE-  
RELATED INJURY DIAGNOSIS BY  
TYPE OF INJURED PERSON,  
ARIZONA RESIDENTS,  
2005-2007**



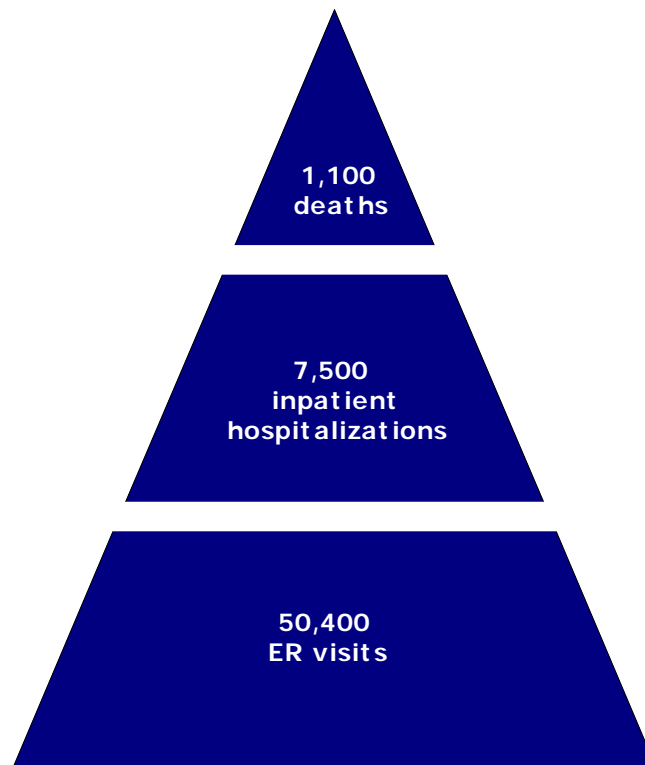


From January 1, 2005 to December 31, 2007, 151,196 Arizona residents were treated in the emergency rooms (ER) because of motor vehicle-related injuries (**Table 4-2**); additionally, 22,608 persons were admitted as inpatients to non-federal, short-stay hospitals (**Table 4-1**). The fact that not all hospitals are included in the Hospital Discharge Database (HDD) has a distorting effect on the reliability of these counts. It particularly affects the American Indian victims of motor vehicle accidents who may be utilizing the facilities of the Indian Health Service. American Indian residents of Arizona account for approximately 5.3 percent of the State's population. In 1993-2007 they disproportionately comprised 16.9 percent of vehicular fatalities but only 5.6 percent of inpatient hospitalizations with the vehicular-related injury diagnosis in non-federal hospitals (based on HDD data for 2005-2007).

In addition, and unlike the data on resident deaths, the Hospital Discharge database only includes information about the encounters occurring in Arizona. There is no inter-state exchange of HDD records, therefore, there is no available information about Arizonans who were injured in motor vehicle accidents outside the State and who were treated in out-of-State emergency rooms or hospitalized as inpatients in out-of-State facilities. In contrast, the database of resident deaths captures both in-State and out-of-State events.

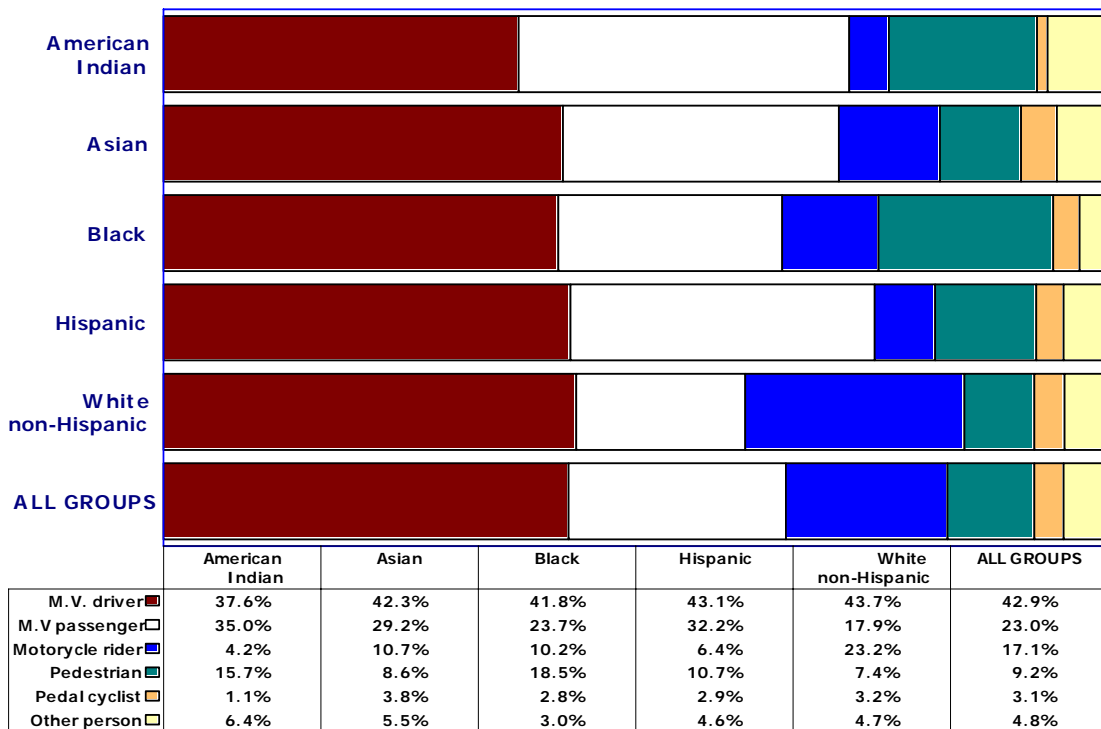
In 2005-2007 on average, there were 1,100 deaths in motor vehicle accidents per year (**Figure 4-1**). For every fatality there were almost 7 times as many inpatient hospitalizations with motor vehicle-related injury diagnosis (7,500/year). The average annual number of 50,400 Arizonans who were admitted to emergency rooms because of motor vehicle-related injuries was, interestingly, almost 7 times greater than the number of inpatient admissions.

**Figure 4-1**  
**Average Annual Number of Deaths, Inpatient Hospitalizations and Emergency Room Visits with Motor Vehicle-Related Injury Diagnosis, Arizona Residents, 2005-2007**



Among the 22,608 Arizonans who were admitted in 2005-2007 as inpatients because of motor vehicle-related injuries, drivers were most prevalent at 42.9 percent, followed by occupants at 23.0 percent, riders of motorcycles at 17.1 percent, pedestrians at 9.2 percent, and pedal cyclists at 3.1 percent (**Table 4-1**). Pedestrian admissions clearly were overrepresented among Blacks or African Americans (18.5 percent or 2 times the average for all groups), and American Indians (15.7 percent, **Figure 4-2**). Inpatient admissions of motorcycle riders were overwhelmingly a White non-Hispanic phenomenon: 84.7 percent of all hospitalized riders of motorcycles were White non-Hispanic, while this race/ethnic group accounted for 62.4 percent of all inpatient hospitalizations with motor vehicle-related injury diagnosis. In contrast, American Indians comprising 5.6 percent of the inpatient admissions accounted for only 1.4 percent hospitalized motorcycle riders, while pedestrian and occupant inpatient admissions were underrepresented among White non-Hispanics.

**Figure 4-2**  
**Percent Distribution of Inpatient Discharges with Motor Vehicle-Related Injury Diagnosis by Type of Injured Person and Race/Ethnicity, Arizona Residents, 2005-2007**



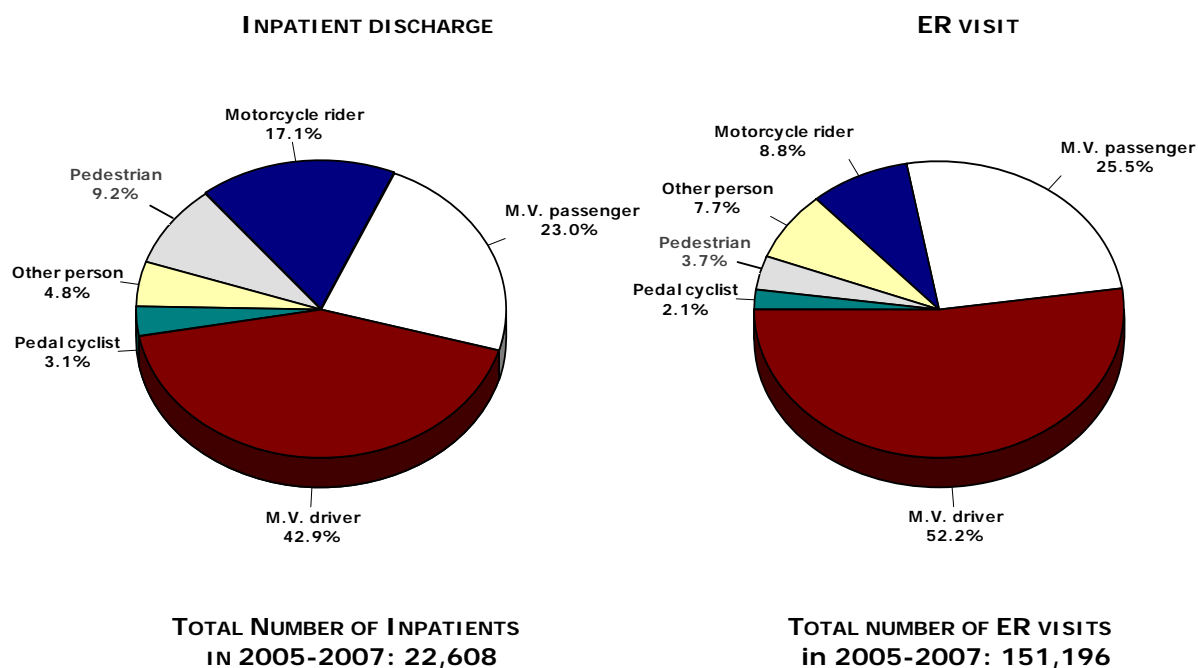
The distribution of ER patients differed considerably from the distribution of inpatients by type of victim (**Table 4-2, Figure 4-3**). Drivers of motor vehicles other than motorcycles comprised 42.9 percent of inpatient discharges but 52.2 of ER visits. Injured pedestrians were 2.5 times more prevalent among the inpatients (9.2 percent), than among the victims of motor vehicle accidents who were treated in emergency rooms (3.7 percent). Similar differences were seen for motorcycle riders (17.1 percent vs. 8.8 percent), and pedal cyclists (3.1 percent vs. 2.1 percent).

With the exception of children aged 14 years or younger, drivers were the most prevalent type of victim treated in the emergency room or admitted as inpatients among adolescents 15-19 years, young adults 20-44 years, middle-aged adults 45-64 years, and elderly aged 65 years and older (**Table 4-2**).

In contrast, and more likely than any other age group, children under 15 years of age who were hospitalized for motor vehicle-related injuries, sustained these injuries as non-driving occupants of motor vehicles, pedestrians, or pedal cyclists.

Among Arizona residents who, in 2005-2007, were treated in emergency rooms because of vehicle-related injuries, the number of females and males was essentially identical (75,405 vs. 75,781, **Table 4-3**). In contrast, males outnumbered females by a ratio of 1.8:1 among the inpatient discharges with motor vehicle-related diagnosis (14,568 vs. 8,037).

**Figure 4-3**  
**Percent Distribution by Type of Injured Person of Inpatient Discharges and**  
**Emergency Room Visits with Motor Vehicle-Related Injury Diagnosis,**  
**Arizona Residents, 2005-2007**



Among both the inpatient discharges and ER visits, females were more likely than males to be treated for injuries sustained as drivers or non-driving occupants of motor vehicles (**Table 4-3**). In contrast, males accounted for 89.5 percent of all inpatient discharges of injured motorcycle riders. Among females who were treated in the ER because of motor vehicle-related injury, 2.4 percent were motorcycle riders compared to 15.2 percent among males. Compared to injured females, injured males also were more likely to sustain injuries as pedal cyclists (3.2 percent of injured males treated in the ER vs. 0.9 percent of injured females) or pedestrians (4.4 percent vs. 3.0 percent).

Similar pattern of gender-specific differences was seen among the inpatient discharges. Almost one in four males who were admitted as inpatients with motor vehicle-related injury diagnosis was a motorcycle rider (23.7 percent, **Table 4-3**), compared to 5.0 percent of females. In contrast, non-driving occupants of motor vehicles comprised 33.9 percent of females who were hospitalized because of vehicle-related injuries, twice the proportion of hospitalized males (16.9 percent).

**Table 4-1  
Frequency Counts and Percent Distribution of Inpatient Discharges with Motor Vehicle-Related Injury Diagnosis by  
Type of Injured Person and Race/Ethnicity, Arizona Residents, 2005-2007**

		Race/ethnicity							Total
		American Indian or Alaska Native	Asian or Pacific Islander	Black or African American	Hispanic or Latino	White non-Hispanic	Other	Refused	
<b>M.V. driver</b>	Count	478	123	329	2,400	6,158	88	123	9,699
	Col %	37.6%	42.3%	41.8%	43.1%	43.7%	37.1%	34.9%	42.9%
<b>M.V. passenger</b>	Count	444	85	187	1,794	2,518	69	99	5,196
	Col %	35.0%	29.2%	23.7%	32.2%	17.9%	29.1%	28.1%	23.0%
<b>Motorcycle rider</b>	Count	53	31	80	356	3,268	24	45	3,857
	Col %	4.2%	10.7%	10.2%	6.4%	23.2%	10.1%	12.8%	17.1%
<b>Pedestrian</b>	Count	200	25	146	594	1,037	31	47	2,080
	Col %	15.7%	8.6%	18.5%	10.7%	7.4%	13.1%	13.4%	9.2%
<b>Pedal cyclist</b>	Count	14	11	22	163	458	9	17	694
	Col %	1.1%	3.8%	2.8%	2.9%	3.2%	3.8%	4.8%	3.1%
<b>Other person</b>	Count	81	16	24	257	667	16	21	1,082
	Col %	6.4%	5.5%	3.0%	4.6%	4.7%	6.8%	6.0%	4.8%
<b>Total</b>	Count	1,270	291	788	5,564	14,106	237	352	22,608
	Col %	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

**Table 4-2  
Frequency Counts and Percent Distribution of Emergency Room Visits and Inpatient Discharges with Motor Vehicle-Related Injury Diagnosis by Type of Injured Person and Age Group, Arizona Residents, 2005-2007**

		Children <15 years	Adolescents 15-19 years	Young adults 20-44 years	Middle-aged adults 45-64 years	Elderly 65+	Unknown	Total	
<b>Inpatient discharge</b>	M.V. driver	Count	197	1,221	4,916	2,170	1,191	4	9,699
		Col %	9.2%	41.2%	48.1%	44.3%	50.7%	33.3%	42.9%
	M.V. passenger	Count	1,212	996	1,747	672	567	2	5,196
		Col %	56.3%	33.6%	17.1%	13.7%	24.2%	16.7%	23.0%
	Motorcycle rider	Count	152	386	2,093	1,094	132		3,857
		Col %	7.1%	13.0%	20.5%	22.3%	5.6%		17.1%
	Pedestrian	Count	386	177	760	538	214	5	2,080
		Col %	17.9%	6.0%	7.4%	11.0%	9.1%	41.7%	9.2%
	Pedal cyclist	Count	129	64	263	189	49		694
		Col %	6.0%	2.2%	2.6%	3.9%	2.1%		3.1%
Other person	Count	77	123	448	239	194	1	1,082	
	Col %	3.6%	4.1%	4.4%	4.9%	8.3%	8.3%	4.8%	
	Count	2,153	2,967	10,227	4,902	2,347	12	22,608	
	Col %	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
<b>Emergency room visit</b>	M.V. driver	Count	1,480	10,612	45,470	16,571	4,833	6	78,972
		Col %	9.1%	45.8%	59.7%	61.0%	56.8%	54.5%	52.2%
	M.V. passenger	Count	10,358	7,768	13,661	4,641	2,145		38,573
		Col %	63.9%	33.5%	17.9%	17.1%	25.2%		25.5%
	Motorcycle rider	Count	1,381	2,113	7,550	2,110	205	2	13,361
		Col %	8.5%	9.1%	9.9%	7.8%	2.4%	18.2%	8.8%
	Pedestrian	Count	1,058	769	2,254	1,121	359	3	5,564
		Col %	6.5%	3.3%	3.0%	4.1%	4.2%	27.3%	3.7%
	Pedal cyclist	Count	646	451	1,330	598	83		3,108
		Col %	4.0%	1.9%	1.7%	2.2%	1.0%		2.1%
Other person	Count	1,275	1,456	5,854	2,145	888		11,618	
	Col %	7.9%	6.3%	7.7%	7.9%	10.4%		7.7%	
	Count	16,198	23,169	76,119	27,186	8,513	11	151,196	
	Col %	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

**Table 4-3  
Frequency Counts and Percent Distribution of Emergency Room Visits and Inpatient Discharges with Motor  
Vehicle-Related Injury Diagnosis by Type of Injured Person and Gender, Arizona Residents, 2005-2007**

		Female		Male		Total*
<b>Inpatient discharge</b>	M.V. driver	Count	3,676	6,023	9,699	
		Col %	45.7%	41.3%	42.9%	
	M.V. passenger	Count	2,728	2,468	5,196	
		Col %	33.9%	16.9%	23.0%	
	Motorcycle rider	Count	404	3,452	3,857	
		Col %	5.0%	23.7%	17.1%	
	Pedestrian	Count	701	1,377	2,080	
		Col %	8.7%	9.5%	9.2%	
	Pedal cyclist	Count	117	577	694	
		Col %	1.5%	4.0%	3.1%	
<b>Emergency room visit</b>	Other person	Count	411	671	1,082	
		Col %	5.1%	4.6%	4.8%	
	Total	Count	8,037	14,568	22,605	
		Col %	100.0%	100.0%	100.0%	
	M.V. driver	Count	41,570	37,397	78,967	
		Col %	55.1%	49.3%	52.2%	
	M.V. passenger	Count	23,478	15,091	38,569	
		Col %	31.1%	19.9%	25.5%	
	Motorcycle rider	Count	1,839	11,522	13,361	
		Col %	2.4%	15.2%	8.8%	
<b>Total</b>	Pedestrian	Count	2,260	3,304	5,564	
		Col %	3.0%	4.4%	3.7%	
	Pedal cyclist	Count	659	2,449	3,108	
		Col %	0.9%	3.2%	2.1%	
	Other person	Count	5,599	6,018	11,617	
		Col %	7.4%	7.9%	7.7%	
	Total	Count	75,405	75,781	151,186	
		Col %	100.0%	100.0%	100.0%	

\*Includes unknown gender.

**5.**  
**TYPES OF INJURIES AND TYPES OF INJURED PERSONS  
AMONG EMERGENCY ROOM VISITS AND INPATIENT  
DISCHARGES WITH MOTOR VEHICLE-RELATED  
INJURY DIAGNOSIS, ARIZONA RESIDENTS,  
2005-2007**

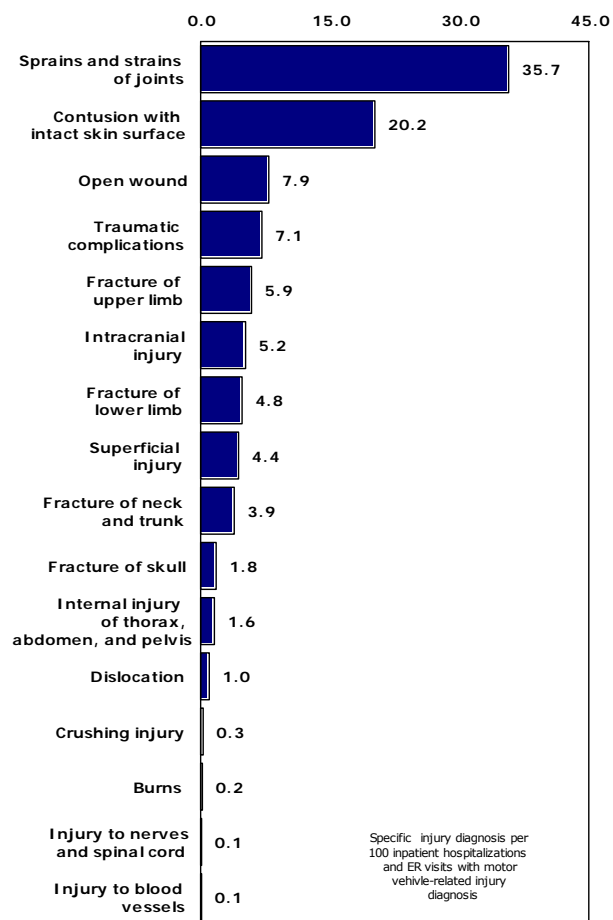




The intent of Section 5 of our report is to identify the prevalence of specific injuries, as well as to identify the differences in prevalence by type of victim of vehicular events. The following 16 diagnostic categories of ICD-9-CM (Clinical Modification) equivalent to patient’s primary diagnosis are used in Table 5-1 – Table 5-5: *fracture of skull* (ICD-9-CM codes 800-804), *fracture of neck and trunk* (805-809), *fracture of upper limb* (810-819), *fracture of lower limb* (820-829), *dislocation* (830-839), *intracranial injury* (excluding skull fracture, 850-854), *sprains and strains of joints and adjacent muscles* (840-848), *internal injury of chest, abdomen, and pelvis* (860-869), *open wound* (870-897), *injury to blood vessels* (900-904), *superficial injury* (910-919), *contusion with intact skin surface* (920-924), *crushing injury* (925-929), *burns* (940-949), *injury to nerves and spinal cord* (950-957), and *certain traumatic complications and unspecified injuries* (958-959).

**Figure 5-1** is based on the data in **Table 5-1** which combine the first-listed diagnoses from 151,196 emergency room encounters and 22,608 inpatient admissions in 2005-2007. Five ICD-9-CM diagnostic categories captured 76.8 percent of the 173,804 cases. From highest to lowest frequency, these categories were *sprains and strains of joints and adjacent muscles* (35.7 percent), *contusion with intact skin surface* (20.2 percent), *open wound* (7.9 percent), *traumatic complications and unspecified injuries* (7.1 percent), and *fracture of upper limb* (5.9 percent).

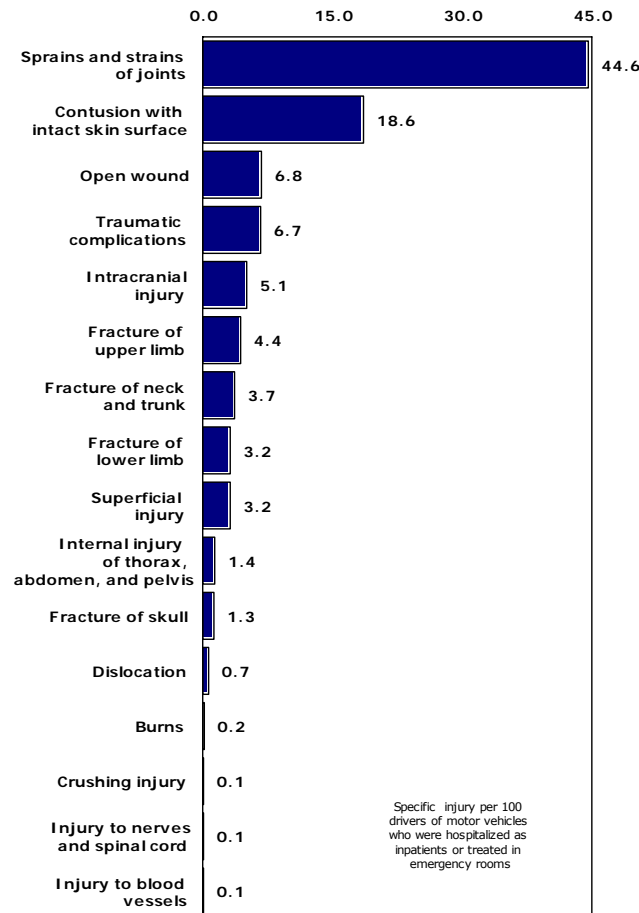
**Figure 5-1**  
**Prevalence of Specific Injuries among Inpatient Hospitalizations and Emergency Room Visits with Motor Vehicle-Related Injury Diagnosis, Arizona Residents, 2005-2007**



Compared to other types of victims in **Table 5-1**, the highest prevalence of *sprains and strains of joints and adjacent muscles* (44.6 percent) was among the injured **drivers of motor vehicles (Figure 5-2)**. The frequency of *contusion with intact skin surface* (18.6 percent), *open wound* (6.8 percent), and *traumatic complication* (6.7 percent) was lower among drivers of motor vehicles than among all victim types combined (**Figure 5-1**). In contrast, *intracranial injury* (5.1 percent) replaced *fracture of upper limb* as the fifth most prevalent type of injury among drivers of motor vehicles.

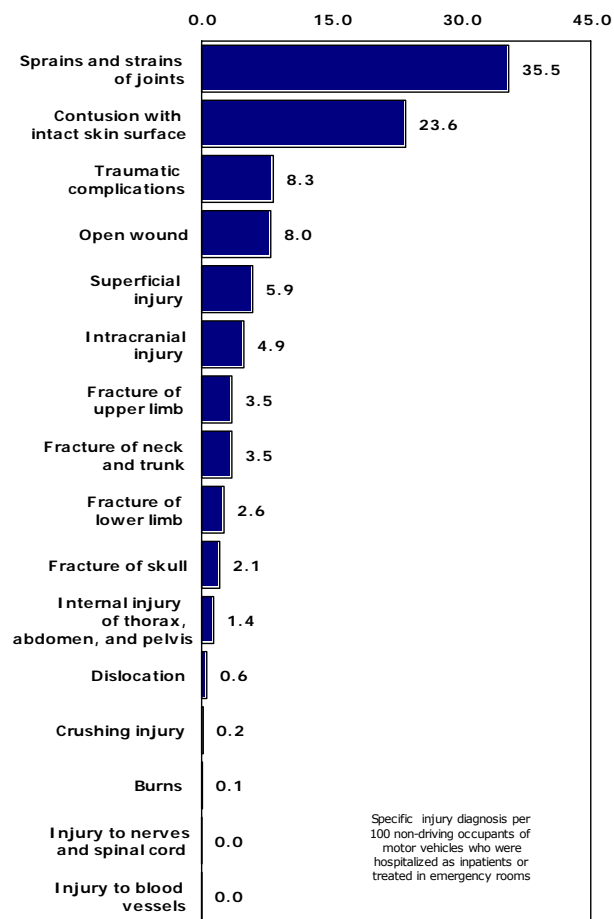
Drivers of motor vehicles had a 69.8 percent lower risk of *fracture of skull* than pedestrians (1.3 percent vs. 4.3 percent, **Table 5-1**). Interestingly, the risk of *injury to nerves and spinal cord* was identical for drivers of motor vehicles, motorcycle riders, pedestrians, and pedal cyclists (0.1 percent).

**Figure 5-2**  
**Prevalence of Specific Injuries among Drivers of Motor Vehicles who were Hospitalized as Inpatients or Treated in Emergency Rooms with Motor Vehicle-Related Injury Diagnosis, Arizona Residents, 2005-2007**



Following sprains and strains of joints and adjacent muscles (35.5 percent), contusion with intact skin surface (23.6), *traumatic complications* were the 3<sup>rd</sup> most frequent injury among non-driving occupants of motor vehicles (Figure 5-3). In fact, non-driving occupants of motor vehicles had higher risk of *traumatic complications* than any other type of victim (Table 5-1). Occupants of motor vehicles had a 61.5 percent higher risk of *skull fracture* (2.1 percent) than drivers (1.3 percent). The risk of *crushing injury* was 2 times as high among occupants (0.2 percent) than it was among drivers of motor vehicles (0.1 percent). Only 21 out of 43,769 non-driving occupants of motor vehicles sustained injury to nerves and spinal cord for a prevalence rate of 0.05 percent (Table 5-1).

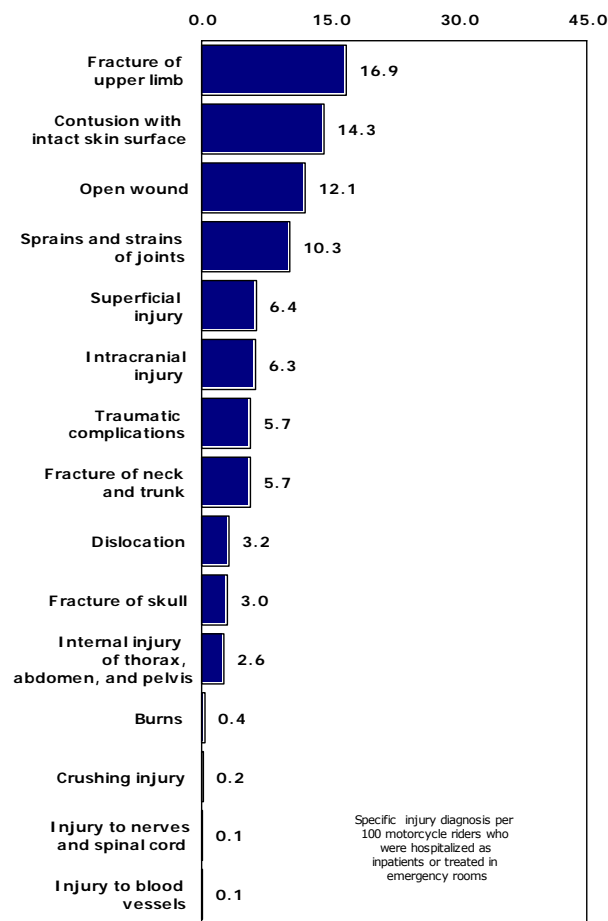
**Figure 5-3**  
**Prevalence of Specific Injuries among Non-Driving Occupants of Motor Vehicles who were Hospitalized as Inpatients or Treated in Emergency Rooms with Motor Vehicle-Related Injury Diagnosis, Arizona Residents, 2005-2007**



The pattern of injuries sustained by **motorcycle riders** was quite different from those of driving or non-driving occupants of motor vehicles. Five ICD-9-CM diagnostic categories comprised 60 percent of injuries to motorcycle riders. From highest to lowest frequency, these categories were *fracture of upper limb* (16.9 percent), *contusion with intact skin surface* (14.3 percent), *open wound* (12.1 percent), *sprains and strains of joints and adjacent muscles* (10.3 percent), and *superficial injury* (6.4 percent). Compared to drivers of motor vehicles, motorcycle riders had a 2.3 times higher risk of skull fracture (1.3 vs. 3.0 percent), and a higher risk than any other type of victim to have *fracture of neck and trunk* (5.7 percent, **Table 5-1, Figure 5-4**). Compared to non-driving occupant of motor vehicles, motorcycle riders had a 4 times higher risk of *burns*.

In 2005-2007, motorcycle riders comprised 9.9 percent of patients with motor vehicle-related injury diagnosis (17,218 out of 173,804), but accounted for 16.2 percent of hospital deaths with motor vehicle-related injury diagnosis (135 out of 834).

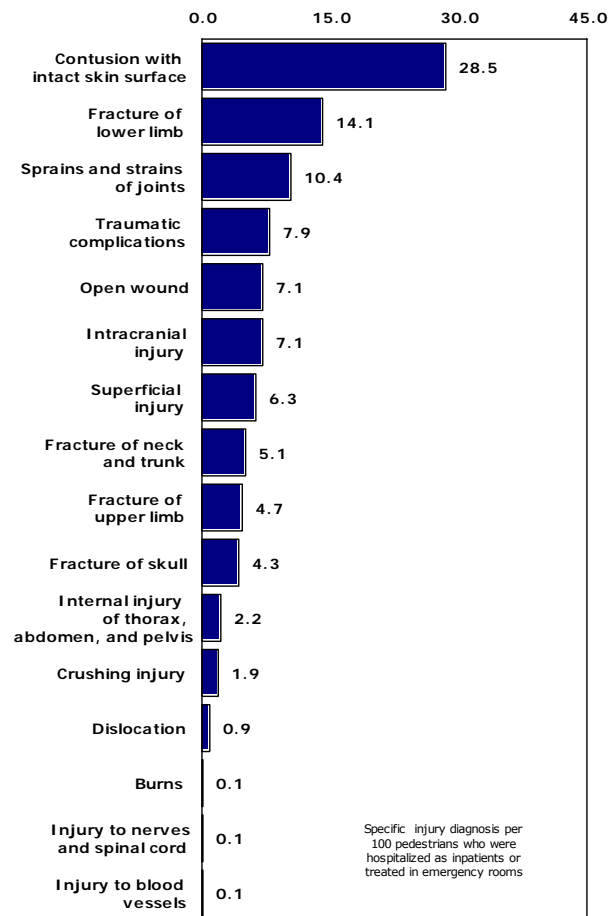
**Figure 5-4**  
**Prevalence of Specific Injuries among Motorcycle Riders who were Hospitalized as Inpatients or Treated in Emergency Rooms with Motor Vehicle-Related Injury Diagnosis, Arizona Residents, 2005-2007**



**Pedestrians** had a 41 percent higher risk of contusion with intact skin surface than any other type of victim (28.5 percent; **Figure 5-5, Figure 5-1**). Moreover, pedestrians clearly had the highest risk to suffer a serious injury, i.e. *skull fracture* (4.3 percent), *fracture of neck and trunk* (5.1 percent), *fracture of lower limb* (14.1 percent), *intracranial injury* (7.1 percent), or *crushing injury* (1.9 percent or 19 times higher risk than drivers of motor vehicles).

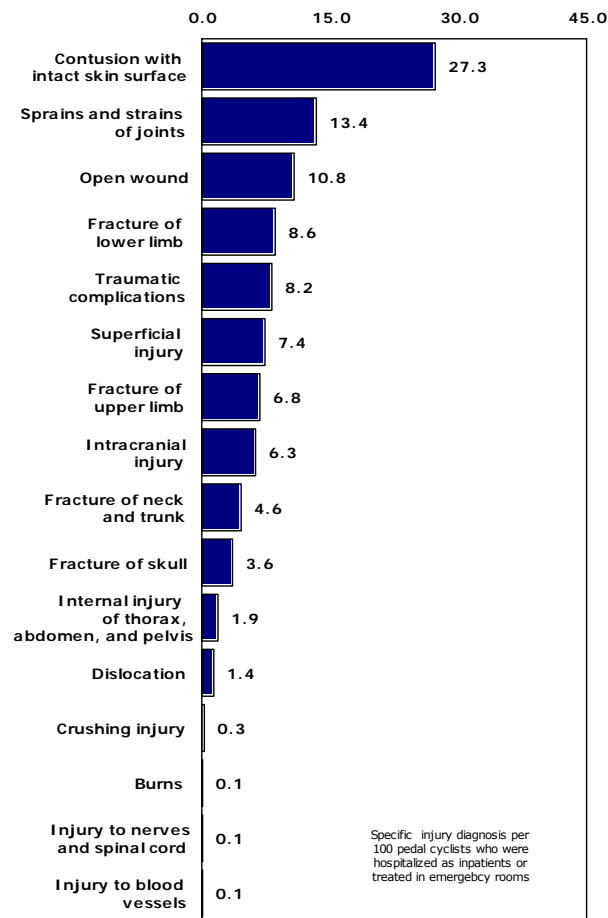
In 2005-2007, pedestrians comprised 4.4 percent of patients with motor vehicle-related injury diagnosis (7,644 out of 173,804), but accounted for 20.5 percent of hospital deaths with motor vehicle-related injury diagnosis (171 out of 834; see Section 6 “Probability of Various Outcomes for Inpatient Discharges and Emergency Room Visits with Motor Vehicle-Related Injury Diagnosis by Type of Injury and type of Injured Person, Arizona residents 2005-2007”).

**Figure 5-5**  
**Prevalence of Specific Injuries among Pedestrians who were Hospitalized as Inpatients or Treated in Emergency Rooms with Motor Vehicle-Related Injury Diagnosis, Arizona Residents, 2005-2007**



In 2005-2007, **pedal cyclists** who comprised 2.2 percent of patients (3,802 out of 173,804, **Table 5-1**) disproportionately accounted for 3.6 percent of hospital deaths with motor vehicle-related injury diagnosis (30 out of 834). Three ICD-9-CM categories captured more than half (51.5 percent) of injuries to pedal cyclists: *contusion with intact skin surface* (27.3 percent), *sprains and strains of joints and adjacent muscles* (13.4 percent), and *open wound* (10.8 percent, **Figure 5-6**). Only motorcycle riders had a higher risk of laceration or penetration of a body part or organ (*open wound*) than pedal cyclists (**Table 5-1**). In contrast, pedal cyclists had a 20 percent higher risk of *skull fracture* than motorcycle riders (3.6 vs. 3.0 percent). Moreover, pedal cyclists had a 3 times higher risk of crushing injury than drivers of motor vehicles (0.3 vs. 0.1 percent).

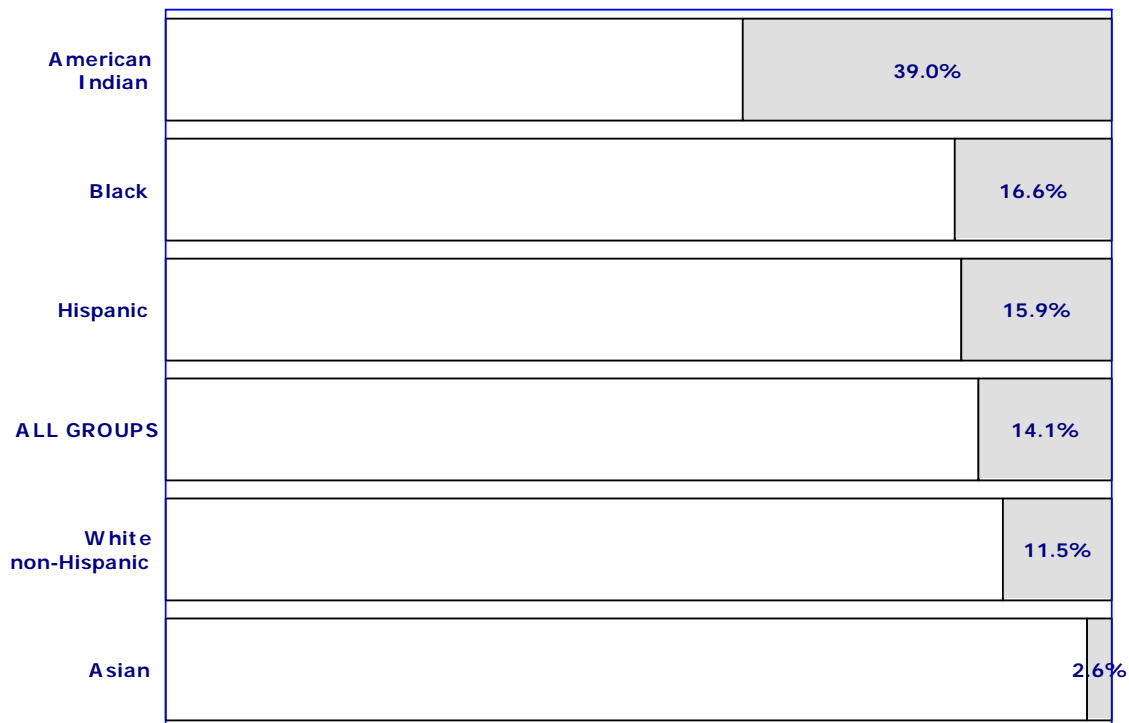
**Figure 5-6**  
**Prevalence of Specific Injuries among Pedal Cyclists who were Hospitalized as Inpatients or Treated in Emergency Rooms with Motor Vehicle-Related Injury Diagnosis, Arizona Residents, 2005-2007**



In 2005-2007, up to nine diagnoses were coded for each hospital discharge. In order to identify the specific injuries in motor vehicle accidents we used the primary diagnosis, or the first one listed on the discharge summary of the medical record. However, we also looked for **any mention of alcohol use/abuse** among the inpatients with motor vehicle-related injury diagnosis. Detailed description of ICD-9-CM codes used to identify alcohol misuse/abuse is available at <http://www.azdhs.gov/plan/hip/for/alcohol/index.htm> . We were unable to determine whether any of the diagnoses mentioning alcohol misuse/abuse was present on admission (this new data element becomes available beginning with the 2008 HDD). We are not claiming that the presence of a diagnostic code related to alcohol abuse signifies that the patient with motor vehicle-related injury was intoxicated at the time of the accident. However, we do think that this additional information about co-morbidity is of heuristic value: it may aid our understanding why certain population subgroups have higher incidence of motor vehicle accidents and fatalities.

Thirty-nine percent of American Indian inpatients with motor vehicle-related injury diagnosis also had alcohol misuse/abuse diagnosis (or diagnoses, since the discharge record may include more than one diagnosis of specific to alcohol abuse, such as alcohol dependence syndrome and excessive blood level of alcohol), the highest ratio among the race/ethnic groups (**Figure 5-7, Table 5-5**). The rank order from highest to lowest ratio in **Figure 5-7** resembles the order of age-adjusted mortality rates for motor vehicle-related injuries, with American Indians having the highest mortality rate and Asians the lowest rate among race/ethnic groups (**Table 1-1**).

**Figure 5-7**  
**Any Mention of Alcohol Use/Abuse\* by Race/Ethnicity among Inpatient Discharges with Motor Vehicle-Related Injury Diagnosis, Arizona Residents, 2005-2007**



\*Any mention of alcohol use/abuse per 100 inpatient discharges with motor vehicle-related injury diagnosis.

**Table 5-1  
Inpatient Hospitalizations and Emergency Room Visits with Motor Vehicle-Related Injury Diagnosis by  
Type of Injured Person and Diagnostic Category, Arizona Residents, 2005-2007**

	M.V. driver		M.V. passenger		Motorcycle rider		Pedestrian		Pedal cyclist		Other person		Total	
	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %
Fracture of skull	1,128	1.3	913	2.1	514	3.0	328	4.3	136	3.6	191	1.5	3,210	1.8
Fracture of neck and trunk	3,268	3.7	1,521	3.5	983	5.7	390	5.1	174	4.6	507	4.0	6,843	3.9
Fracture of upper limb	3,935	4.4	1,545	3.5	2,910	16.9	362	4.7	259	6.8	1,178	9.3	10,189	5.9
Fracture of lower limb	2,822	3.2	1,130	2.6	2,235	13.0	1,078	14.1	328	8.6	705	5.6	8,298	4.8
Dislocation	643	0.7	246	0.6	548	3.2	70	0.9	54	1.4	175	1.4	1,736	1.0
Sprains and strains of joints and adjacent muscles	39,506	44.6	15,536	35.5	1,781	10.3	796	10.4	508	13.4	3,959	31.2	62,086	35.7
Intracranial injury, excluding those with skull fracture	4,563	5.1	2,160	4.9	1,084	6.3	540	7.1	240	6.3	474	3.7	9,061	5.2
Internal injury of thorax, abdomen, and pelvis	1,245	1.4	632	1.4	447	2.6	165	2.2	72	1.9	136	1.1	2,697	1.6
Open wound	6,013	6.8	3,506	8.0	2,078	12.1	543	7.1	409	10.8	1,233	9.7	13,782	7.9
Injury to blood vessels	52	0.1	20	0.0	18	0.1	7	0.1	5	0.1	10	0.1	112	0.1
Contusion with intact skin surface	16,466	18.6	10,318	23.6	2,466	14.3	2,176	28.5	1,037	27.3	2,644	20.8	35,107	20.2
Crushing injury	77	0.1	79	0.2	43	0.2	148	1.9	10	0.3	182	1.4	539	0.3
Burns	183	0.2	45	0.1	73	0.4	7	0.1	5	0.1	71	0.6	384	0.2
Injury to nerves and spinal cord	79	0.1	21	0.0	14	0.1	11	0.1	2	0.1	8	0.1	135	0.1
Superficial injury	2,831	3.2	2,561	5.9	1,109	6.4	482	6.3	282	7.4	446	3.5	7,711	4.4
Traumatic complications and unspecified injuries	5,945	6.7	3,647	8.3	987	5.7	601	7.9	313	8.2	829	6.5	12,322	7.1
<b>Total</b>	<b>88,671</b>	<b>100.0</b>	<b>43,769</b>	<b>100.0</b>	<b>17,218</b>	<b>100.0</b>	<b>7,644</b>	<b>100.0</b>	<b>3,802</b>	<b>100.0</b>	<b>12,700</b>	<b>100.0</b>	<b>173,804</b>	<b>100.0</b>



**Table 5-2  
Emergency Room Visits with Motor Vehicle-Related Injury Diagnosis by Type of Injured Person and Diagnostic Category,  
Arizona Residents, 2005-2007**

	M.V. driver		M.V. passenger		Motorcycle rider		Pedestrian		Pedal cyclist		Other person		Total	
	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %
Fracture of skull	415	0.5	326	0.8	138	1.0	71	1.3	41	1.3	90	0.8	1,081	0.7
Fracture of neck and trunk	1,425	1.8	570	1.5	460	3.4	104	1.9	63	2.0	304	2.6	2,926	1.9
Fracture of upper limb	3,051	3.9	1,136	2.9	2,327	17.4	233	4.2	206	6.6	1,043	9.0	7,996	5.3
Fracture of lower limb	1,146	1.5	441	1.1	1,070	8.0	448	8.1	149	4.8	425	3.7	3,679	2.4
Dislocation	529	0.7	188	0.5	499	3.7	53	1.0	46	1.5	161	1.4	1,476	1.0
Sprains and strains of joints and adjacent muscles	39,344	49.8	15,465	40.1	1,755	13.1	778	14.0	504	16.2	3,949	34.0	61,795	40.9
Intracranial injury, excl. those with skull fracture	2,724	3.4	1,208	3.1	630	4.7	199	3.6	116	3.7	325	2.8	5,202	3.4
Internal injury of thorax, abdomen, and pelvis	223	0.3	80	0.2	97	0.7	24	0.4	12	0.4	43	0.4	479	0.3
Open wound	5,428	6.9	3,082	8.0	1,870	14.0	424	7.6	375	12.1	1,173	10.1	12,352	8.2
Injury to blood vessels	6	0.0	1	0.0	1	0.0	1	0.0	0	0.0	2	0.0	11	0.0
Contusion with intact skin surface	16,139	20.4	10,101	26.2	2,427	18.2	2,144	38.5	1,016	32.7	2,625	22.6	34,452	22.8
Crushing injury	48	0.1	55	0.1	19	0.1	119	2.1	9	0.3	167	1.4	417	0.3
Burns	161	0.2	36	0.1	62	0.5	4	0.1	2	0.1	57	0.5	322	0.2
Injury to nerves and spinal cord	27	0.0	3	0.0	3	0.0	6	0.1	1	0.0	5	0.0	45	0.0
Superficial injury	2,773	3.5	2,489	6.5	1,079	8.1	452	8.1	276	8.9	439	3.8	7,508	5.0
Traumatic complications and unspecified injuries	5,505	7.0	3,382	8.8	927	6.9	516	9.3	296	9.5	803	6.9	11,429	7.6
<b>Total</b>	<b>78,972</b>	<b>100.0</b>	<b>38,573</b>	<b>100.0</b>	<b>13,361</b>	<b>100.0</b>	<b>5,564</b>	<b>100.0</b>	<b>3,108</b>	<b>100.0</b>	<b>11,618</b>	<b>100.0</b>	<b>151,196</b>	<b>100.0</b>

**Table 5-3  
Inpatient Hospitalizations with Motor Vehicle-Related Injury Diagnosis by Type of Injured Person, Gender and Diagnostic Category, Arizona Residents, 2005-2007**

	M.V. driver		M.V. passenger		Motorcycle rider		Pedestrian		Pedal cyclist		Other person		Total	
	F	M	F	M	F	M	F	M	F	M	F	M	F	M
Fracture of skull	186	527	267	320	43	333	66	191	11	84	31	70	604	1,525
Fracture of neck and trunk	753	1,090	577	374	54	468	144	142	17	94	94	109	1,639	2,277
Fracture of upper limb	383	501	228	181	61	522	51	78	12	41	60	75	795	1,398
Fracture of lower limb	679	997	391	298	115	1,050	204	425	25	154	134	146	1,548	3,070
Dislocation	45	69	25	33	0	49	1	16	1	7	3	11	75	185
Sprains and strains of joints and adjacent muscles	80	82	41	30	2	24	7	11	0	4	2	8	132	159
Intracranial injury, excluding those with skull fracture	647	1,192	487	465	47	407	110	230	24	100	42	107	1,357	2,501
Internal injury of thorax, abdomen, and pelvis	351	671	268	284	34	316	47	94	8	52	36	57	744	1,474
Open wound	186	399	181	243	32	176	28	91	7	27	22	38	456	974
Injury to blood vessels	15	31	8	11	3	14	1	5	1	4	4	4	32	69
Contusion with intact skin surface	179	148	131	86	7	32	15	17	6	15	4	15	342	313
Crushing injury	9	20	12	12	1	23	12	17	0	1	0	15	34	88
Burns	3	19	6	3	2	9	1	2	0	3	1	13	13	49
Injury to nerves and spinal cord	17	35	10	8	1	10	0	5	0	1	0	3	28	62
Superficial injury	23	35	30	42	4	26	11	19	0	6	0	7	68	135
Traumatic complications and unspecified injuries	164	276	136	129	3	57	29	56	6	11	7	19	345	548
<b>Total</b>	<b>3,676</b>	<b>6,023</b>	<b>2,728</b>	<b>2,468</b>	<b>404</b>	<b>3,452</b>	<b>701</b>	<b>1,377</b>	<b>117</b>	<b>577</b>	<b>411</b>	<b>671</b>	<b>8,037</b>	<b>14,568</b>

**Table 5-4  
Emergency Room Visits with Motor Vehicle-Related Injury Diagnosis by Type of Injured Person, Gender and  
Diagnostic Category, Arizona Residents, 2005-2007**

	M.V. driver		M.V. passenger		Motorcycle rider		Pedestrian		Pedal cyclist		Other person		Total	
	F	M	F	M	F	M	F	M	F	M	F	M	F	M
Fracture of skull	162	253	170	155	23	115	20	51	8	33	23	67	406	674
Fracture of neck and trunk	508	916	329	241	47	413	32	72	15	48	123	181	1,054	1,871
Fracture of upper limb	1,178	1,872	642	494	253	2,074	87	146	32	174	396	647	2,588	5,407
Fracture of lower limb	514	632	283	158	108	962	147	301	28	121	168	257	1,248	2,431
Dislocation	132	397	98	90	28	471	13	40	2	44	38	123	311	1,165
Sprains and strains of joints and adjacent muscles	23,323	16,020	10,326	5,137	288	1,467	355	423	102	402	2,243	1,705	36,637	25,154
Intracranial injury, excluding those with skull fracture	1,100	1,624	620	588	98	532	74	125	24	92	127	198	2,043	3,159
Internal injury of thorax, abdomen, and pelvis	61	162	41	39	12	85	7	17	2	10	14	29	137	342
Open wound	1,724	3,704	1,411	1,671	251	1,619	126	298	71	304	440	733	4,023	8,329
Injury to blood vessels	2	4	0	1	0	1	0	1	0	0	0	2	2	9
Contusion with intact skin surface	8,858	7,281	6,330	3,771	405	2,022	962	1,182	239	777	1,347	1,278	18,141	16,311
Crushing injury	16	32	29	26	4	15	58	61	3	6	87	80	197	220
Burns	94	67	19	17	17	45	0	4	1	1	22	35	153	169
Injury to nerves and spinal cord	12	15	2	1	1	2	2	4	0	1	2	3	19	26
Superficial injury	1,194	1,577	1,253	1,235	164	915	161	291	65	211	187	252	3,024	4,481
Traumatic complications and unspecified injuries	2,675	2,830	1,922	1,460	140	787	221	295	68	228	377	426	5,403	6,026
<b>Total</b>	<b>41,570</b>	<b>37,397</b>	<b>23,478</b>	<b>15,091</b>	<b>1,839</b>	<b>11,522</b>	<b>2,260</b>	<b>3,304</b>	<b>659</b>	<b>2,449</b>	<b>5,599</b>	<b>6,018</b>	<b>75,405</b>	<b>75,781</b>

**Table 5-5**  
**Any Mention of Alcohol Use/Abuse among Inpatient Discharges with Motor Vehicle-Related Injury Diagnosis**  
**by Race/Ethnicity and Year, Arizona Residents, 2005-2007**

	2005	2006	2007
<b>American Indian or Alaska Native</b>	456	445	369
Any mention of alcohol use/abuse	153	168	144
%	<b>33.6</b>	<b>37.8</b>	<b>39.0</b>
<b>Asian or Pacific Islander</b>	106	108	77
Any mention of alcohol use/abuse	9	6	2
%	<b>8.5</b>	<b>5.6</b>	<b>2.6</b>
<b>Black or African American</b>	252	259	277
Any mention of alcohol use/abuse	30	28	46
%	<b>11.9</b>	<b>10.8</b>	<b>16.6</b>
<b>Hispanic or Latino</b>	2,048	1,858	1,658
Any mention of alcohol use/abuse	250	263	263
%	<b>12.2</b>	<b>14.2</b>	<b>15.9</b>
<b>White non-Hispanic</b>	4,945	4,588	4,573
Any mention of alcohol use/abuse	438	508	528
%	<b>8.9</b>	<b>11.1</b>	<b>11.5</b>
<b>Total, all groups*</b>	8,036	7,450	7,122
Any mention of alcohol use/abuse	912	1,004	1,005
%	<b>11.3</b>	<b>13.5</b>	<b>14.1</b>

\*Includes other race.

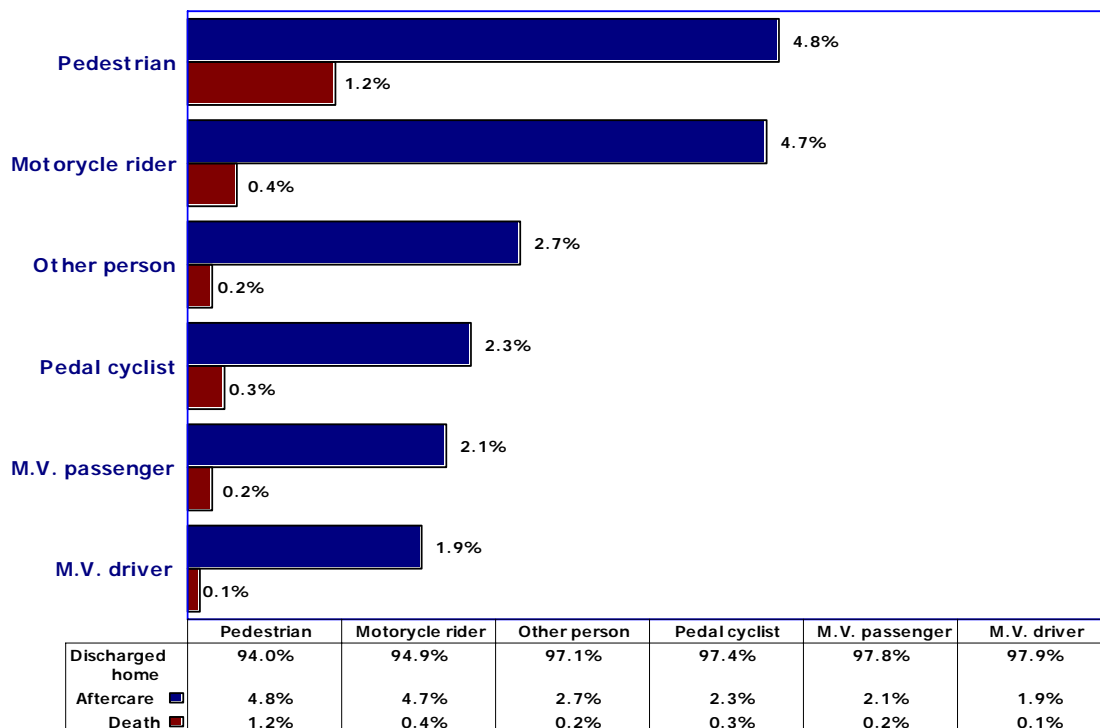
**6.**  
**PROBABILITY OF VARIOUS OUTCOMES**  
**FOR INPATIENT DISCHARGES AND EMERGENCY ROOM**  
**VISITS WITH MOTOR VEHICLE-RELATED INJURY**  
**DIAGNOSIS BY TYPE OF INJURY AND**  
**TYPE OF INJURED PERSON,**  
**ARIZONA RESIDENTS,**  
**2005-2007**



The distribution of injured persons by type of victim differed considerably from the victim distribution of fatalities. In 2005-2007, among those who were treated in emergency rooms (ER) drivers were most prevalent at 52.2 percent, followed by occupants at 25.5 percent, motorcycle riders at 8.8 percent, pedestrians at 3.7 percent, and pedal cyclists at 2.1 percent (the percentages are based on data in **Table 6-1**).

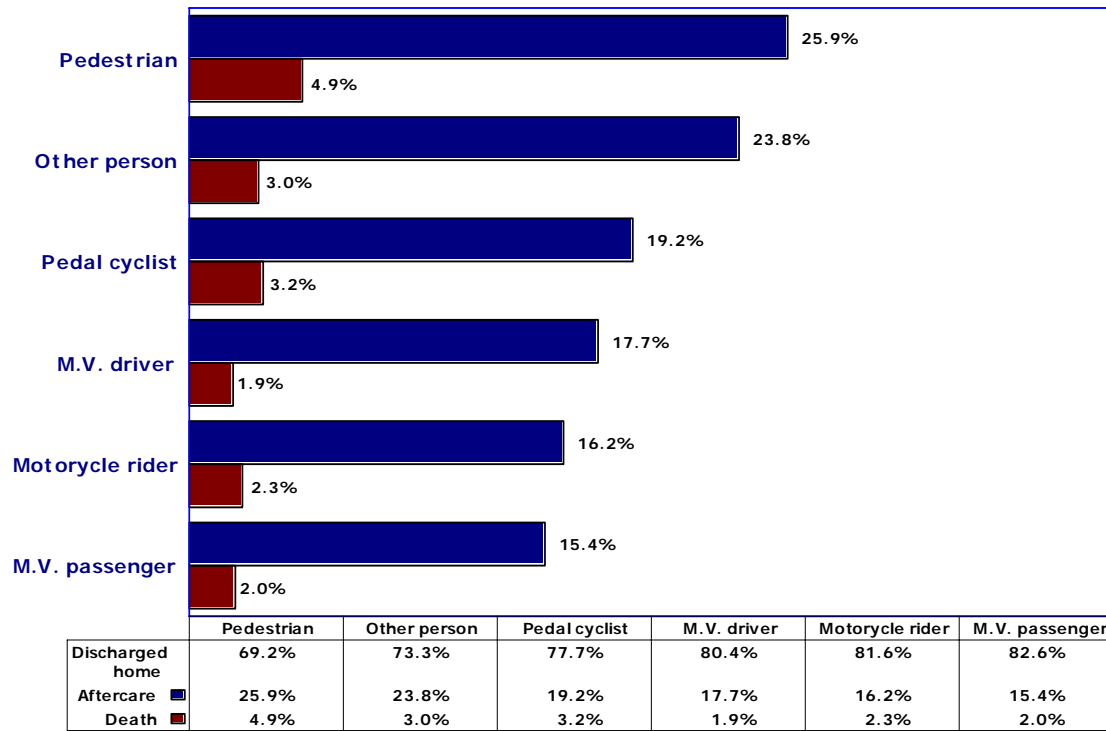
Three hundred of the ER injury patients died during the visit for a case-fatality rate of 0.2 percent. Pedestrians' case fatality rate was the highest (1.2 percent), followed by motorcycle riders (0.4 percent), and pedal cyclists (0.3 percent, **Figure 6-1**). Pedestrians (4.8 percent) and motorcycle riders (4.7 percent) were also more likely to be discharged from the emergency room to other care facilities, referred to as aftercare. Aftercare includes short term care, skilled nursing home, intermediate care, or rehabilitative care. Overall, 97.4 percent of injured ER patients were discharged home.

**Figure 6-1**  
**Probability of Various Outcomes by Type of Injured Person among Emergency Room Visits with Motor Vehicle-Related Injury Diagnosis, Arizona Residents, 2005-2007**



The ER data include only those who were not admitted as inpatients. Among the 22,608 Arizonans who survived long enough to become inpatients, 534 died during their hospital stay for a case fatality of 2.4 percent. Again, pedestrians' case fatality rate was the highest (4.9 percent), followed by pedal cyclists (3.2 percent, **Table 6-1**, **Figure 6-2**). Pedestrians also were more likely than any other victim category to require aftercare (25.9 percent). Compared to 97.4 of persons treated in emergency rooms, those admitted to inpatient treatment were considerably less likely to be discharged home (79.7 percent).

**Figure 6-2**  
**Probability of Various Outcomes by Type of Injured Person among Inpatient Discharges with Motor Vehicle-Related Injury Diagnosis, Arizona Residents, 2005-2007**



**Table 6-2** compares the probability of death, as well as the likelihood of extended morbidity, as indexed by aftercare, for the 15 diagnostic categories. The specific bodily trauma of each injured ER patient or hospital inpatient was equivalent to his/her primary diagnosis as stated in ICD-9-CM codes.

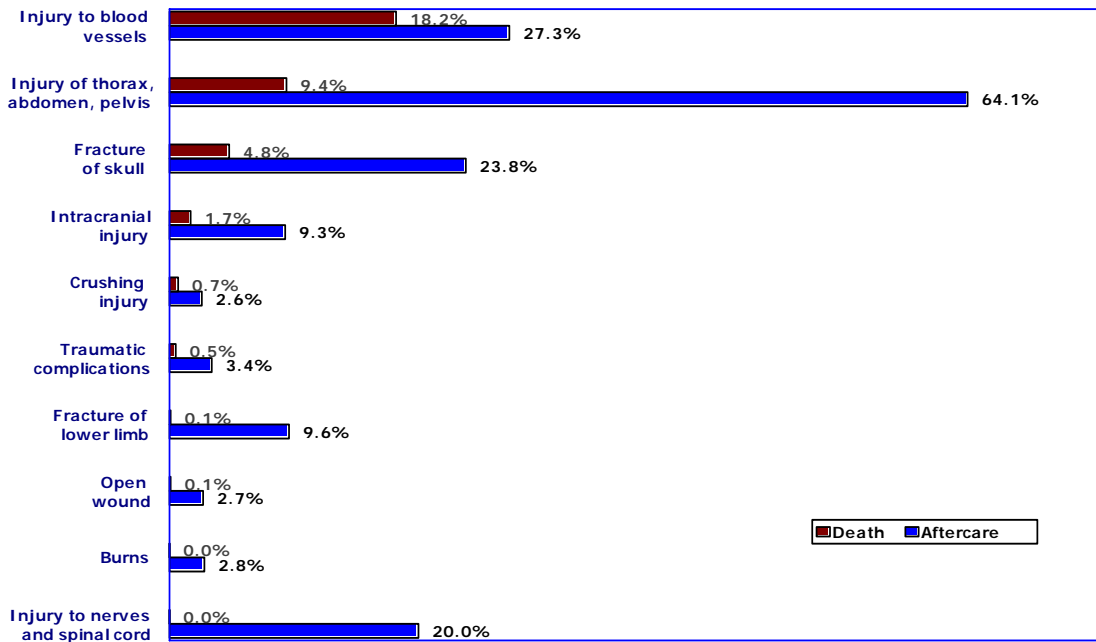
Six diagnostic categories captured 89.6 percent of the ER cases. From the highest to lowest frequency, these categories were sprains and strains of joints and adjacent muscles (40.9 percent), contusion with intact skin surface (22.8 percent), open wound (8.2 percent), traumatic complications and unspecified injuries (7.6 percent), fracture of upper limb (5.3 percent), and superficial injury (5.0 percent).

In 2005-2007, injury to blood vessels (18.2 percent of ER patients died), injury to thorax, abdomen or pelvis (9.4 percent), fracture of skull (4.8 percent), and intracranial injury (1.7 percent) had the highest probabilities of death (**Figure 6-3**). Among ER patients with injury to thorax/abdomen/pelvis who survived the scene of the motor vehicle accident, transport to emergency room, and emergency room treatment, 64.1 percent required aftercare.

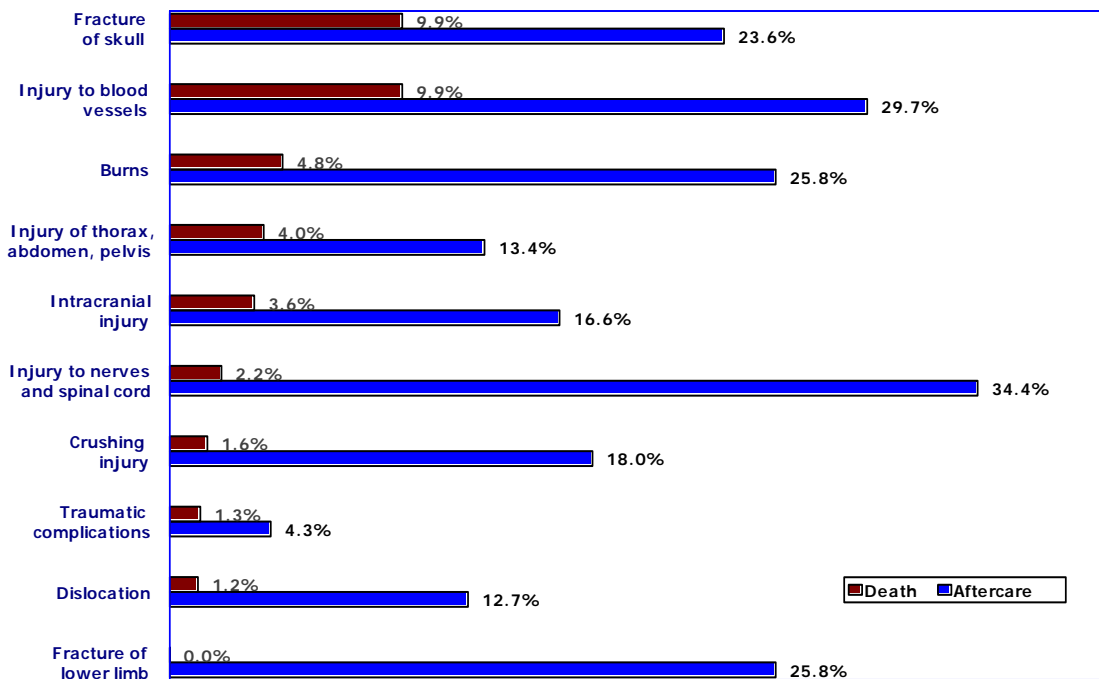
The top six diagnostic categories that accounted for 72.8 percent of the inpatient cases in 2005-2007 were as follows: fracture of lower limb (20.4 percent), intracranial injury (excluding those with skull fracture, 17.1 percent), internal injury of thorax/abdomen/pelvis (9.8 percent), fracture of upper limb (9.7 percent), fracture of skull (9.4 percent), and open wound (6.3 percent). Fracture of skull and injury to blood vessels had the highest probability of death (9.9 percent) for inpatients. Inpatients with injury to nerves and spinal cord (34.4 percent) followed by injury to blood vessels (29.7 percent) were most likely to be discharged to aftercare.



**Figure 6-3**  
**Probability of Death or Aftercare for Selected Diagnostic Categories among Emergency Room Visits with Motor Vehicle-Related Injury Diagnosis, Arizona Residents, 2005-2007**



**Figure 6-4**  
**Probability of Death or Aftercare for Selected Diagnostic Categories among Inpatient Discharges with Motor Vehicle-Related Injury Diagnosis, Arizona Residents, 2005-2007**



**Table 6-1  
 Inpatient Discharges and Emergency Room Visits with Motor Vehicle-Related Injury Diagnosis and  
 Probability of Various Outcomes by Type of Injured Person, Arizona Residents, 2005-2007**

	Outcomes										Total	
	Discharged home		Aftercare in a different facility		Death							
	Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count	Row %
<b>Inpatient discharge</b>	M.V. driver	7,800	80.4%	1,714	17.7%	185	1.9%	9,699	100.0%			
	M.V. passenger	4,292	82.6%	798	15.4%	106	2.0%	5,196	100.0%			
	Motorcycle rider	3,146	81.6%	624	16.2%	87	2.3%	3,857	100.0%			
	Pedestrian	1,439	69.2%	539	25.9%	102	4.9%	2,080	100.0%			
	Pedal cyclist	539	77.7%	133	19.2%	22	3.2%	694	100.0%			
	Other person	793	73.3%	257	23.8%	32	3.0%	1,082	100.0%			
	<b>Total</b>	<b>18,009</b>	<b>79.7%</b>	<b>4,065</b>	<b>18.0%</b>	<b>534</b>	<b>2.4%</b>	<b>22,608</b>	<b>100.0%</b>			
<b>Emergency room visit</b>	M.V. driver	77,347	97.9%	1,533	1.9%	92	0.1%	78,972	100.0%			
	M.V. passenger	37,717	97.8%	794	2.1%	62	0.2%	38,573	100.0%			
	Motorcycle rider	12,682	94.9%	631	4.7%	48	0.4%	13,361	100.0%			
	Pedestrian	5,228	94.0%	267	4.8%	69	1.2%	5,564	100.0%			
	Pedal cyclist	3,027	97.4%	73	2.3%	8	0.3%	3,108	100.0%			
	Other person	11,278	97.1%	319	2.7%	21	0.2%	11,618	100.0%			
	<b>Total</b>	<b>147,279</b>	<b>97.4%</b>	<b>3,617</b>	<b>2.4%</b>	<b>300</b>	<b>0.2%</b>	<b>151,196</b>	<b>100.0%</b>			

**Table 6-2  
Inpatient Discharges and Emergency Room Visits with Motor Vehicle-Related Injury Diagnosis by  
Probability of Various Outcomes for Each Diagnostic Category, Arizona Residents, 2005-2007**

			Outcomes			Total
			Discharged home	Aftercare in a different facility	Death	
Inpatient discharge	Fracture of skull	Count	1,416	503	210	2,129
		Row %	66.5%	23.6%	9.9%	100.0%
	Fracture of upper limb	Count	1,962	226	5	2,193
		Row %	89.5%	10.3%	0.2%	100.0%
	Fracture of lower limb	Count	3,419	1,192	8	4,619
		Row %	74.0%	25.8%	0.0	100.0%
	Dislocation	Count	224	33	3	260
		Row %	86.2%	12.7%	1.2%	100.0%
	Sprains and strains of joints and adjacent muscles	Count	283	8	0	291
		Row %	97.3%	2.7%	0.0%	100.0%
	Intracranial injury, excluding those with skull fracture	Count	3,081	639	139	3,859
		Row %	79.8%	16.6%	3.6%	100.0%
	Internal injury of thorax, abdomen, and pelvis	Count	1,831	298	89.0	2,218
		Row %	82.6%	13.4%	4.0%	100.0%
	Open wound	Count	1,336	94	0.0	1,430
		Row %	93.4%	6.6%	0.0%	100.0%
	Injury to blood vessels	Count	61	30	10	101
		Row %	60.4%	29.7%	9.9%	100.0%
	Superficial injury	Count	197	6	0	203
		Row %	97.0%	3.0%	0.0%	100.0%
Contusion with intact skin surface	Count	631	24	0	655	
	Row %	96.3%	3.7%	0.0%	100.0%	
Crushing injury	Count	98	22	2	122	
	Row %	80.3%	18.0%	1.6%	100.0%	
Burns	Count	43	16	3	62	
	Row %	69.4%	25.8%	4.8%	100.0%	
Injury to nerves and spinal cord	Count	57	31	2	90	
	Row %	63.3%	34.4%	2.2%	100.0%	
Traumatic complications and unspecified injuries	Count	843	38	12	893	
	Row %	94.4%	4.3%	1.3%	100.0%	
Total	Count	18,009	4,065	534	22,608	
	Row %	79.7%	18.9%	2.4%	100.0%	
Emergency room visit	Fracture of skull	Count	772	257	52	1,081
		Row %	71.4%	23.8%	4.8%	100.0%
	Fracture of upper limb	Count	7,692	301	3	7,996
		Row %	96.2%	3.8%	0.0%	100.0%
	Fracture of lower limb	Count	3,322	354	3	3,679
		Row %	90.3%	9.6%	0.1%	100.0%
	Dislocation	Count	1,437	38	1	1,476
		Row %	97.4%	2.6%	0.1%	100.0%
	Sprains and strains of joints and adjacent muscles	Count	61,658	136	1	61,795
		Row %	99.8%	0.2%	0.0%	100.0%
	Intracranial injury, excl. those with skull fracture	Count	4,632	482	88	5,202
		Row %	89.0%	9.3%	1.7%	100.0%
	Internal injury of thorax, abdomen, and pelvis	Count	127	307	45	479
		Row %	26.5%	64.1%	9.4%	100.0%
	Open wound	Count	12,010	329	13	12,352
		Row %	97.2%	2.7%	0.1%	100.0%
	Injury to blood vessels	Count	6	3	2	11
		Row %	54.5%	27.3%	18.2%	100.0%
	Superficial injury	Count	7,421	84	3	7,508
		Row %	98.8%	1.1%	0.0%	100.0%
Contusion with intact skin surface	Count	34,215	233	4	34,452	
	Row %	99.3%	0.7%	0.0%	100.0%	
Crushing injury	Count	403	11	3	417	
	Row %	96.6%	2.6%	0.7%	100.0%	
Burns	Count	313	9	0	322	
	Row %	97.2%	2.8%	0.0%	100.0%	
Injury to nerves and spinal cord	Count	36	9	0	45	
	Row %	80.0%	20.0%	0.0%	100.0%	
Traumatic complications and unspecified injuries	Count	10,976	391	62	11,429	
	Row %	96.0%	3.4%	0.5%	100.0%	
Total	Count	147,279	3,617	300	151,196	
	Row %	97.4%	2.4%	0.2%	100.0%	



**7.**  
**HOSPITAL CHARGES INCURRED BY PATIENTS WITH**  
**MOTOR VEHICLE-RELATED INJURY DIAGNOSIS BY**  
**TYPE OF INJURED PERSON AND TYPE OF INJURY,**  
**ARIZONA RESIDENTS,**  
**2005-2007**



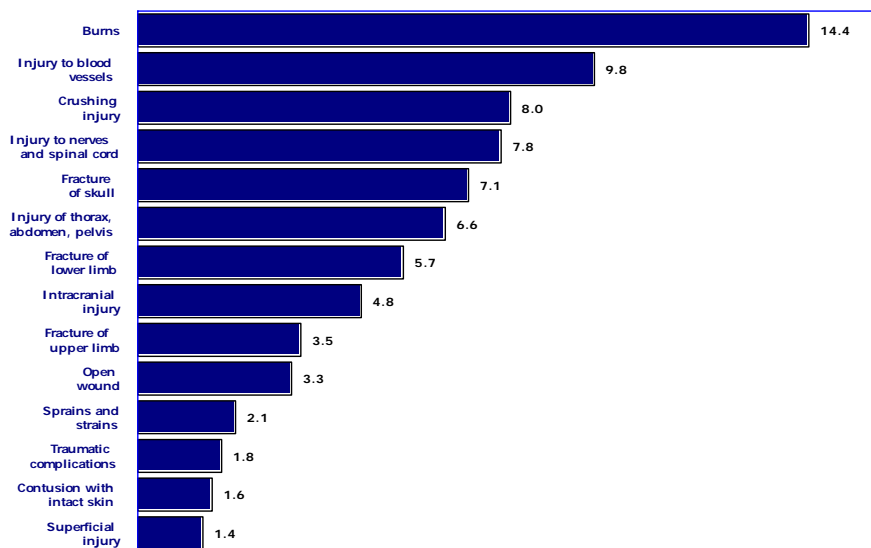
In 2005-2007, the average length of hospital stay for Arizona inpatients was 4.4 days. The percent of patients hospitalized for 3 days or less increased to 62.3 percent, with only 13.2 percent of inpatients staying 8 days or more.

The average length of stay for inpatients with motor vehicle-related injury diagnosis was 18.2 percent longer at 5.2 days (**Table 7-1**). Average lengths of stay in the hospital varied by the five major victim types. Pedestrians, followed by motorcycle riders had the highest average length of stay (6.8 days and 5.4 days, respectively). Non-driving occupants of motor vehicles had the shortest average stay (4.6 days).

Fifty-eight percent of patients with motor vehicle-related injury diagnosis were hospitalized for 3 days or less. Twenty-three percent were hospitalized for 4-7 days with 19 percent of inpatients staying 8 days or more. Hospital stays ranged from 1 to 123 days for drivers, 1 to 118 days for pedestrians, and 1 to 57 days for pedal cyclists.

Trauma- or injury-specific average lengths of stay (**Figure 7-1**) varied from a low of 1.4 days for inpatients with superficial injury diagnosis to a high of 14.4 days for inpatients who suffered burns. Drivers of motor vehicles in this injury group experienced the longest average length of stay of 22.1 days (**Table 7-1**).

**Figure 7-1**  
**Average Length of Stay for Inpatients with Motor Vehicle-Related Injury Diagnosis**  
**by Type of Injury, Arizona Residents, 2005-2007**

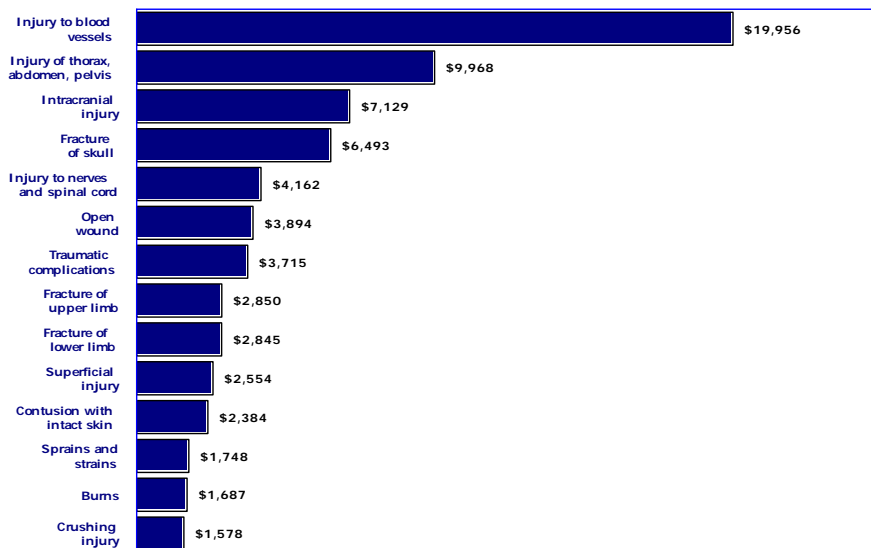


In 2007 alone, total charges incurred by ER patients with motor vehicle-related injury diagnosis exceeded \$150 million (\$156,230,596). The 3-year total charges for 2005-2007 exceeded \$400 million (\$403,741,858). The

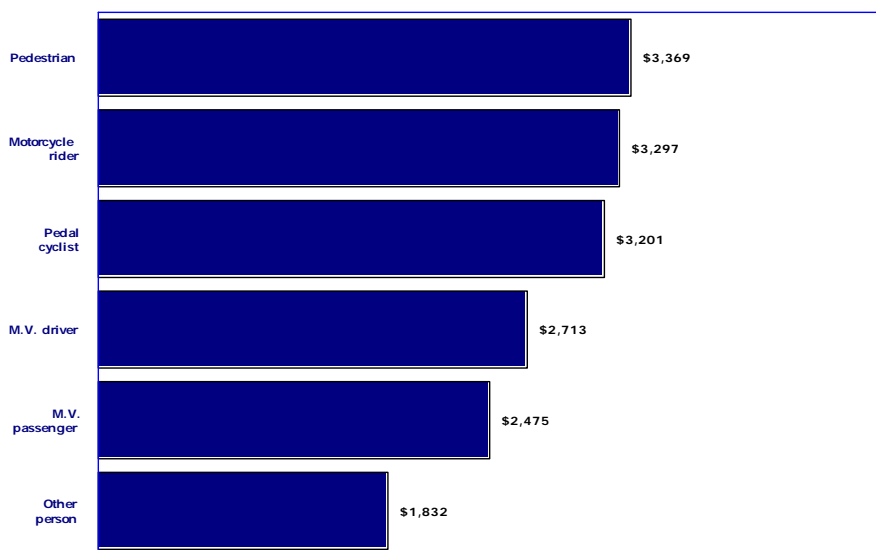
average charges shown in **Table 7-2** and **Table 7-3** were computed using the hospital discharge data for 2005-2007.

In 2005-2007, the average bill for 151,196 ER patients with motor vehicle-related injury diagnosis was \$2,670 (**Table 7-2**). Patients who had injury to blood vessels had the highest average ER charges (\$19,956, **Figure 7-2**). Pedestrians, followed by motorcycle riders, and pedal cyclists had the highest average ER charges (\$3,369, \$3,297, and \$3,201, respectively; **Figure 7-3**).

**Figure 7-2**  
**Average Charges Incurred by Emergency Room Patients with Motor Vehicle-Related Injury Diagnosis by Type of Injury, Arizona Residents, 2005-2007**



**Figure 7-3**  
**Average Charges Incurred by Emergency Room Patients with Motor Vehicle-Related Injury Diagnosis by Type of Injured Person, Arizona Residents, 2005-2007**

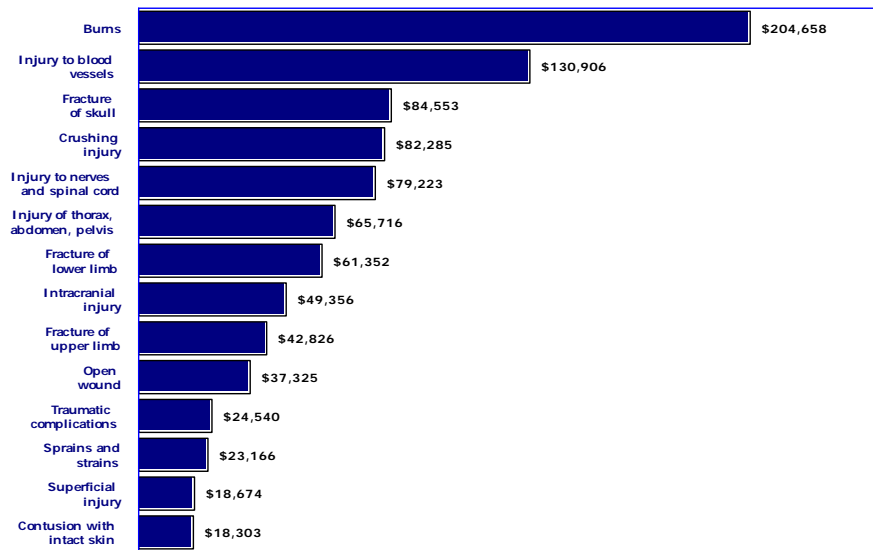




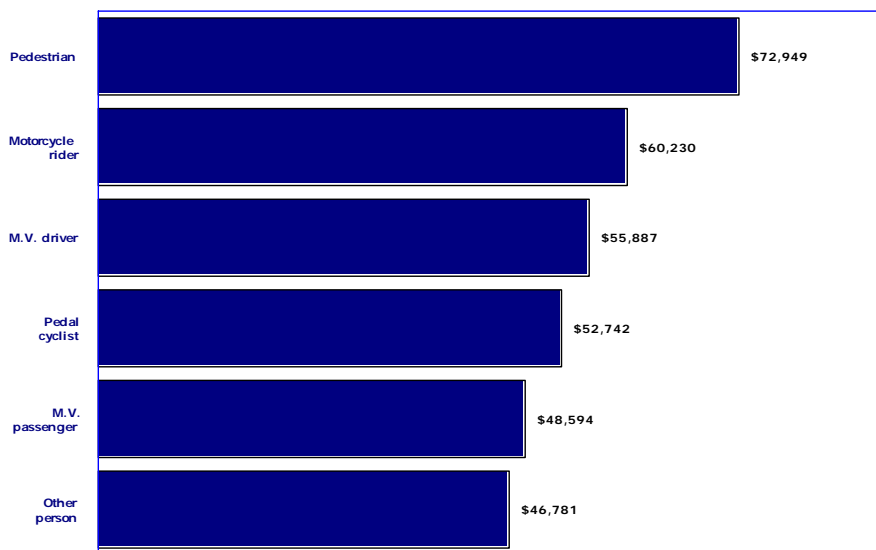
In 2007, the total hospital bill for the 22,608 injured inpatients was more than \$450 million (\$452,433,771). The total charges for 2005-2007 exceeded one billion dollars (\$1,265,746,679). The average charges shown in **Table 7-2** and **Table 7-3** were computed using the hospital discharge data for 2005-2007.

In 2005-2007, the average bill for the hospital inpatients with motor vehicle-related injury diagnosis was \$55,989 (**Table 7-3**). Inpatients who had burns had the highest average inpatients charges (\$204,658, **Figure 7-4**). Pedestrians, followed by motorcycle riders, had the highest average hospital charges (\$72,949 and \$60,230, respectively; **Figure 7-5**).

**Figure 7-4**  
Average Charges Incurred by Hospital Inpatients with Motor Vehicle-Related Injury Diagnosis by Type of Injury, Arizona Residents, 2005-2007



**Figure 7-5**  
Average Charges Incurred by Hospital Inpatients with Motor Vehicle-Related Injury Diagnosis by Type of Injured Person, Arizona Residents, 2005-2007



**Table 7-1  
Average Length of Stay for Inpatient Discharges with Motor Vehicle-Related Injury Diagnosis by  
Type of Injured Person and Diagnostic Category, Arizona Residents, 2005-2007**

	Total	M.V. driver	M.V. passenger	Motorcycle rider	Pedestrian	Pedal cyclist	Other person
Fracture of skull	7.1	6.4	5.9	8.3	9.8	6.2	8.6
Fracture of upper limb	3.5	3.6	3.6	3.3	4.5	3.7	3.0
Fracture of lower limb	5.7	5.7	5.4	5.5	7.1	4.8	5.4
Dislocation	4.1	3.8	4.6	2.9	8.5	4.8	3.7
Sprains and strains of joints and adjacent muscles	2.1	2.1	1.8	2.2	3.1	1.5	1.5
Intracranial injury, excluding those with skull fracture	4.8	4.3	4.3	5.8	5.8	5.2	8.1
Internal injury of thorax, abdomen, and pelvis	6.6	6.8	6.2	6.0	6.9	6.8	8.0
Open wound	3.3	2.8	2.4	4.8	5.6	3.8	4.4
Injury to blood vessels	9.8	10.8	9.1	7.8	9.3	7.4	12.0
Superficial injury	1.4	1.1	1.1	1.3	2.7	1.2	1.4
Contusion with intact skin surface	1.6	1.6	1.5	1.5	1.2	1.8	3.0
Crushing injury	8.0	7.2	7.7	9.5	7.5	2.0	9.1
Burns	14.4	22.1	10.4	6.9	8.3	15.0	11.7
Injury to nerves and spinal cord	7.8	6.4	12.6	8.7	3.8	4.0	9.7
Traumatic complications and unspecified injuries	1.8	1.8	1.6	2.0	2.6	1.3	2.1
<b>Total</b>	<b>5.2</b>	<b>4.9</b>	<b>4.6</b>	<b>5.4</b>	<b>6.8</b>	<b>5.1</b>	<b>6.3</b>

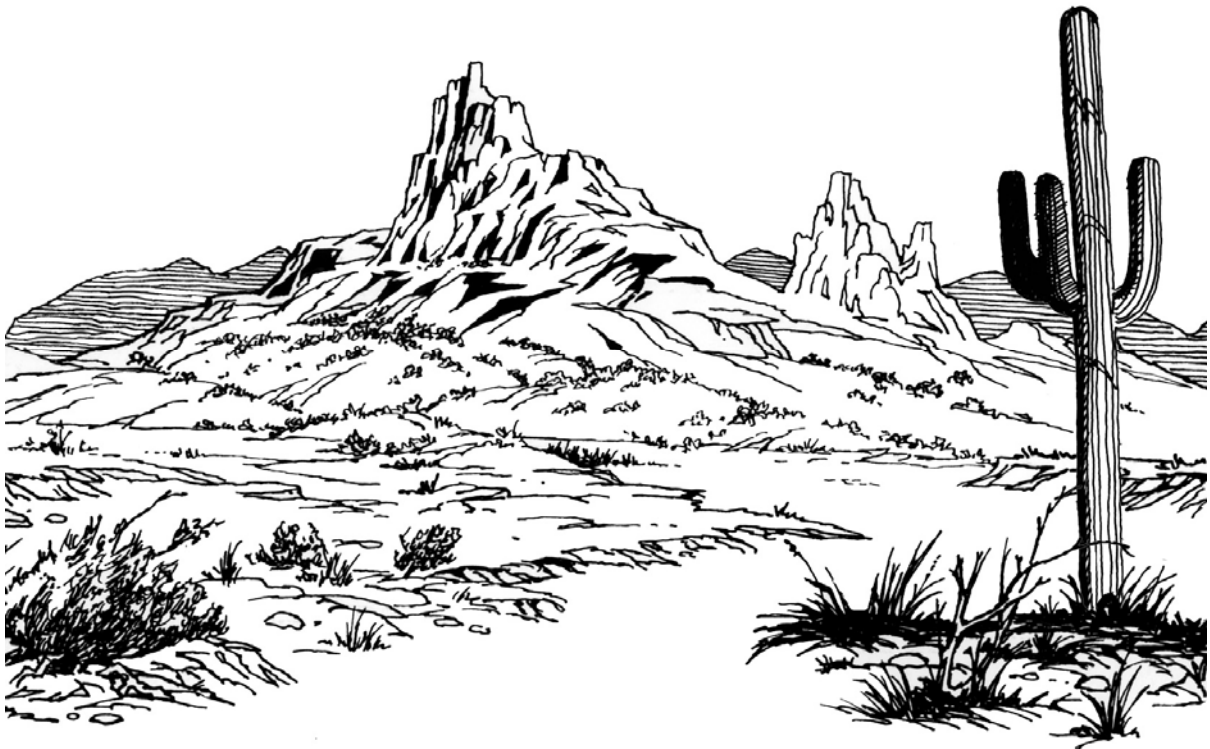
**Table 7-2  
Average Charges Incurred by Emergency Room Patients with Motor Vehicle-Related Injury Diagnosis by  
Type of Injured Person and Diagnostic Category, Arizona Residents, 2005-2007**

	Total	M.V. driver	M.V. passenger	Motorcycle rider	Pedestrian	Pedal cyclist	Other person
Fracture of skull	\$6,493	\$6,404	\$5,521	\$7,811	\$10,194	\$7,474	\$5,037
Fracture of upper limb	\$2,850	\$3,012	\$3,151	\$2,919	\$3,640	\$3,041	\$1,677
Fracture of lower limb	\$2,845	\$3,143	\$3,363	\$2,700	\$2,873	\$3,197	\$1,712
Dislocation	\$2,951	\$3,307	\$3,400	\$2,546	\$3,520	\$3,736	\$2,101
Sprains and strains of joints and adjacent muscles	\$1,748	\$1,799	\$1,642	\$2,120	\$2,203	\$2,233	\$1,331
Intracranial injury, excluding those with skull fracture	\$7,129	\$7,262	\$6,958	\$7,003	\$9,901	\$7,291	\$5,141
Internal injury of thorax, abdomen, and pelvis	\$9,968	\$9,697	\$11,283	\$9,263	\$11,919	\$8,691	\$9,785
Open wound	\$3,894	\$4,264	\$3,948	\$3,577	\$5,031	\$4,353	\$1,993
Injury to blood vessels	\$19,956	\$23,725	\$30,817	\$29,326	\$6,429	NA	\$5,295
Superficial injury	\$2,554	\$2,716	\$2,180	\$2,922	\$3,571	\$2,718	\$1,602
Contusion with intact skin surface	\$2,384	\$2,639	\$2,106	\$2,708	\$2,346	\$2,390	\$1,618
Crushing injury	\$1,578	\$2,949	\$1,079	\$2,261	\$1,646	\$1,190	\$1,244
Burns	\$1,687	\$1,568	\$1,522	\$1,613	\$4,734	\$22,416	\$1,265
Injury to nerves and spinal cord	\$4,162	\$5,079	\$6,794	\$4,307	\$1,674	\$1,337	\$1,097
Traumatic complications and unspecified injuries	\$3,715	\$4,048	\$3,273	\$4,192	\$3,986	\$3,825	\$2,537
<b>Total, all injuries</b>	<b>\$2,670</b>	<b>\$2,713</b>	<b>\$2,475</b>	<b>\$3,297</b>	<b>\$3,369</b>	<b>\$3,201</b>	<b>\$1,832</b>

**Table 7-3  
Average Charges Incurred by Inpatients with Motor Vehicle-Related Injury Diagnosis by  
Type of Injured Person and Diagnostic Category, Arizona Residents, 2005-2007**

	Total	M.V. driver	M.V. passenger	Motorcycle rider	Pedestrian	Pedal cyclist	Other person
Fracture of skull	\$84,553	\$84,303	\$67,248	\$99,359	\$108,464	\$71,214	\$83,484
Fracture of upper limb	\$42,826	\$45,634	\$41,304	\$41,217	\$51,044	\$42,520	\$28,272
Fracture of lower limb	\$61,352	\$62,690	\$56,784	\$62,520	\$73,291	\$49,100	\$40,696
Dislocation	\$48,992	\$49,055	\$48,735	\$34,150	\$103,743	\$35,199	\$42,886
Sprains and strains of joints and adjacent muscles	\$23,166	\$23,145	\$20,500	\$26,914	\$28,171	\$25,096	\$22,904
Intracranial injury, excluding those with skull fracture	\$49,356	\$46,291	\$44,848	\$57,643	\$69,041	\$48,591	\$46,320
Internal injury of thorax, abdomen, and pelvis	\$65,716	\$70,745	\$58,783	\$54,486	\$83,368	\$63,128	\$68,779
Open wound	\$37,325	\$34,255	\$28,642	\$56,360	\$54,819	\$42,171	\$25,196
Injury to blood vessels	\$130,906	\$168,322	\$114,531	\$108,714	\$95,940	\$74,956	\$63,002
Superficial injury	\$18,674	\$18,914	\$17,143	\$17,327	\$24,680	\$13,300	\$17,076
Contusion with intact skin surface	\$18,303	\$18,702	\$18,544	\$15,507	\$17,116	\$16,608	\$18,306
Crushing injury	\$82,285	\$78,126	\$76,612	\$106,419	\$93,330	\$13,773	\$44,004
Burns	\$204,658	\$418,990	\$59,507	\$69,745	\$89,832	\$89,233	\$116,502
Injury to nerves and spinal cord	\$79,223	\$71,038	\$109,653	\$94,382	\$35,551	\$58,099	\$62,751
Traumatic complications and unspecified injuries	\$24,540	\$25,345	\$21,791	\$24,647	\$29,937	\$21,155	\$23,239
<b>Total, all injuries</b>	<b>\$55,989</b>	<b>\$55,887</b>	<b>\$48,594</b>	<b>\$60,230</b>	<b>\$72,949</b>	<b>\$52,742</b>	<b>\$46,781</b>

Our Web site at <http://www.azdhs.gov/plan> provides instantaneous access to a wide range of statistical information about health status of Arizonans. The *Arizona Health Status and Vital Statistics* annual report examines trends in natality, mortality, and morbidity towards established health objectives. Additional reports and studies include *Differences in the Health Status Among Race/Ethnic Groups*, *Advance Vital Statistics by County of Residence*, *Mortality from Alzheimer's Disease*, *Injury Mortality among Arizona Residents* (accidents, suicides, homicides, legal intervention, firearm-related fatalities, drug-related deaths, drowning deaths, falls among Arizonans 65 years or older), hospital inpatient and emergency room statistics for *mental disorders, asthma, diabetes, influenza and pneumonia* and *substance abuse*, *Community Vital Statistics*, *Teenage Pregnancy*, *Selected Characteristics of Newborns and Mothers Giving Birth by Census Tract* in Maricopa County, Pima County and South Phoenix Area, *Health Status Profile of American Indians in Arizona*, *Deaths from Exposure to Excessive Natural Heat Occurring in Arizona*, *Obesity in Arizona: Prevalence, Hospital Care Utilization, Mortality, and Marital Status and Health*.



**Health Status and Vital Statistics Section  
Bureau of Public Health Statistics  
ARIZONA DEPARTMENT OF HEALTH SERVICES**