

Poisonings among Arizona Residents, 2011



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Executive Summary

Poisoning was the leading cause of injury-related mortality among Arizona residents in 2011; among injury deaths of all manners, 1,144 (25 percent) were attributable to poisoning. Males aged 45 through 54 years had the highest rate of poisoning-related deaths with 38.3 deaths per 100,000 residents. Poisoning mortality rates were highest among American Indians (24.6 deaths per 100,000 residents) and non-Hispanic Whites (21.8 deaths per 100,000 residents). Seventy-seven percent of the poisoning-related deaths in 2011 were due to unintentional injuries (n=880); 16 percent were due to suicide (n=187); and seven percent were of an undetermined manner of death (n=77). The poisons most commonly specified on death certificates in 2011 were alcohol (16 percent, n=186), Oxycodone or Hydrocodone (15 percent, n=175), and heroin (10 percent, n=120). Among counties with at least 20 poisoning-related deaths in 2011, Navajo County had the highest fatality rate (35.1 deaths per 100,000 residents).

In 2011, there were 6,930 non-fatal inpatient hospitalizations due to poisonings. Adult females had the highest rates of non-fatal poisoning-related inpatient hospitalizations. Females 45 through 54 years of age had a rate of 167.7 cases per 100,000 residents, and females 35 through 44 years of age had a rate of 163.6 cases per 100,000 residents. African-American residents had the highest age-adjusted poisoning-related rate of non-fatal inpatient hospitalizations in 2011 (135.0 per 100,000) followed very closely by white, non-Hispanic Arizona residents (134.7 cases per 100,000 residents). Unintentional poisoning accounted for 47 percent of non-fatal inpatient hospitalizations (n=3,280), and self-inflicted poisonings comprised an additional 44 percent (n=3,076). Hospital charges for non-fatal poisoning-related inpatient hospitalizations totaled more than \$127 million in 2011, and Arizona residents spent a total of 13,822 days hospitalized for these injuries. Gila County had the highest age-adjusted rate of inpatient hospitalizations due to non-fatal poisonings (156.0 hospitalizations per 100,000 residents).

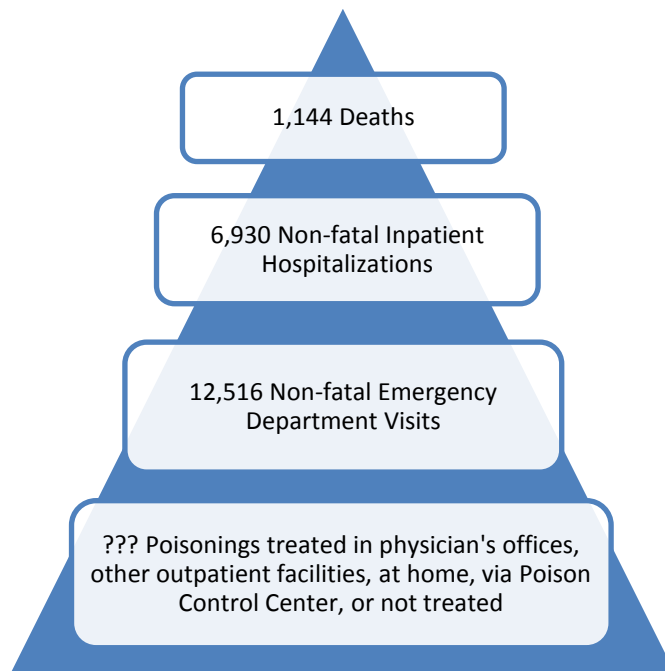
In 2011, there were 12,516 non-fatal poisoning-related emergency department visits among Arizona residents. The highest age-specific rates of non-fatal poisoning-related emergency department visits for both males and females were among children younger than five years of age (412.5 visits per 100,000 residents and 396.5 per 100,000 residents, respectively). Fifty-two percent of the non-fatal poisoning-related emergency department visits were the result of unintentional poisonings (n=6,464), and 34 percent of the visits resulted from self-inflicted injuries (n=4,299).

The data presented in this report show that poisoning is a public health problem that impacts the lives of thousands of Arizona residents each year. These injuries can occur throughout the life span, and like so many injuries, poisonings are predictable and preventable. Understanding the circumstances of poisonings is an important step towards educating and empowering communities and implementing prevention strategies.

Overview of Poisonings among Arizona Residents

Fatalities and injuries resulting from poisonings are significant problems in Arizona. Beginning in 2007, poisoning-related deaths surpassed motor-vehicle crashes as the leading injury-related cause of death among Arizonans.¹ As this report shows, the burden of poisoning-related injuries has increased in recent years, accounting for a greater percentage of injury-related morbidity and mortality. Figure 1 presents an overview of the number of poisoning-related events by outcome and illustrates the limitations of currently available data sources and the inability to enumerate the true number of poisonings.

Figure 1. Poisoning Outcomes Pyramid, Arizona 2011



This report presents a comprehensive picture of poisoning-related injuries among Arizona residents in 2011, as well as poisoning trends during the five years since 2007. To help better understand the data, information about poison control centers are also presented. For additional information about data sources and methods used, please refer to the Methodology section of this report. ***To learn about preventing poisonings, please refer to the Prevention Tips and Resources section of this report.***

¹ Please refer to the Methodology Section for a description of the types of poisonings included in this report; these numbers may not match other publications.

Poison Control Centers Serving Arizona

Poison Control Centers (PCCs) are widely considered to be a cost-effective tool for reducing healthcare costs resulting from poisoning events. It has been estimated that for every dollar invested in a PCC, seven dollars of medical care can be avoided.² Because of the clear benefit to citizens, the state of Arizona has mandated the existence of a PCC since 1980. Per Arizona Revised Statutes 36-1161 through 36-1163, the Arizona Department of Health Services is responsible for establishing a poison and drug information system consisting of two poison control centers. While the poison control centers are charged with serving as a resource for poison identification and treatment, it is also tasked with educating the public about poisoning prevention.

As of October 2011, two of the nation's 57 nationally recognized PCCs were located in Arizona. The Arizona Poison and Drug Information Center (APDIC) is affiliated with the University of Arizona College of Pharmacy located in Tucson. The Banner Good Samaritan Poison & Drug Information Center (BGSPDIC) is located in Phoenix. The BGSPDIC serves Maricopa County, including the metropolitan Phoenix area. The APDIC serves the remainder of the state. While the BGSPDIC serves a smaller geographic area, it covers about 60 percent of the state's residents.

Similar to other nationally recognized PCCs, both Arizona centers are accessed by calling the National Poison Control Center toll-free telephone number: 1-800-222-1222. Calls to this number are routed to the appropriate PCC based on geography. Because calls are routed based on the telephone number from which the call is placed, individuals with an Arizona telephone area code will speak to either BGSPDIC or APDIC, even if they are calling from outside Arizona. Individuals are encouraged to call PCCs with any concerns, whether or not an incident has occurred. While providing information and medical advice about poisonings, both of Arizona's centers provide additional services to residents, including drug information and identification, medical consultation with clinicians, and poisoning prevention education and outreach.

In 2011, the APDIC documented 24,183 calls for human exposures to toxins and poisons, out of 51,332 total calls (47 percent). Twenty-one of these cases resulted in death and 33 percent (n=7,932) of the calls were managed in a healthcare facility.

In 2011, the BGSPDIC documented 48,002 calls for human exposures to toxins and poisons, out of more than 98,578 total calls (43 percent). Twenty-four percent of the calls for poison exposures were managed in a healthcare facility, and 73 percent of calls were managed at home.

The availability of a 24-hour poison control center allows many people who may have sought emergency care to be treated in their own homes, resulting in financial savings for themselves and the healthcare facilities they may have otherwise visited. BGSPDIC estimates that 29,000 callers may have sought medical treatment at an emergency department in 2010 if they had not been able to consult with the poison control center and care for themselves at home.³

A survey of patients who called a PCC found that 79 percent of the patients surveyed would have used the local emergency medical services in the absence of a poison control hotline, at an estimated cost of more than five times the operating costs of the PCC.⁴

² Miller TR, Lestina DC. Costs of poisoning in the United States and savings from poison control centers: A benefit-cost analysis. *Ann Emerg Med* February 1997; 29:239-245.

³ Banner Good Samaritan Poison & Drug Information Center 2010 Summary, accessed Oct. 23rd, 2012 at www.bannerhealth.com/Locations/Arizona/Banner+Good+Samaritan+Poison+and+Drug+Information+Center/About+Us/By+the+Numbers.htm

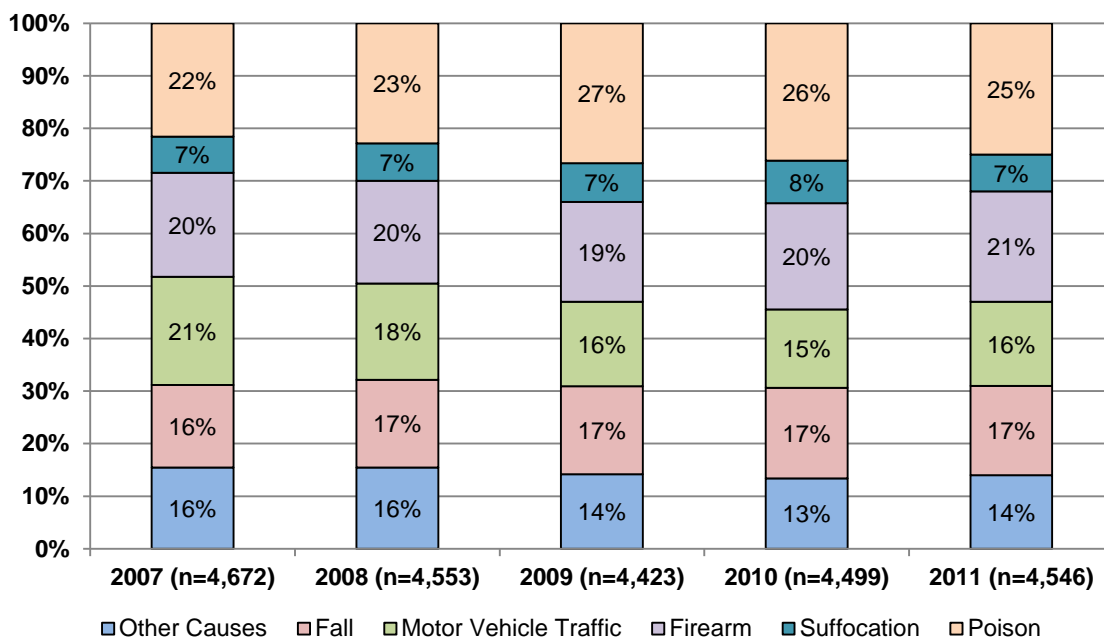
⁴ Kearney TE, Olson KR, Bero LA, Heard SE, Blanc PD. Health Care Cost Effects of Public Use of a Regional Poison Control Center. *West J Med* 1995; 162:499-504.

Five-Year Trends in Poisonings among Arizona Residents, 2007-2011

Mortality

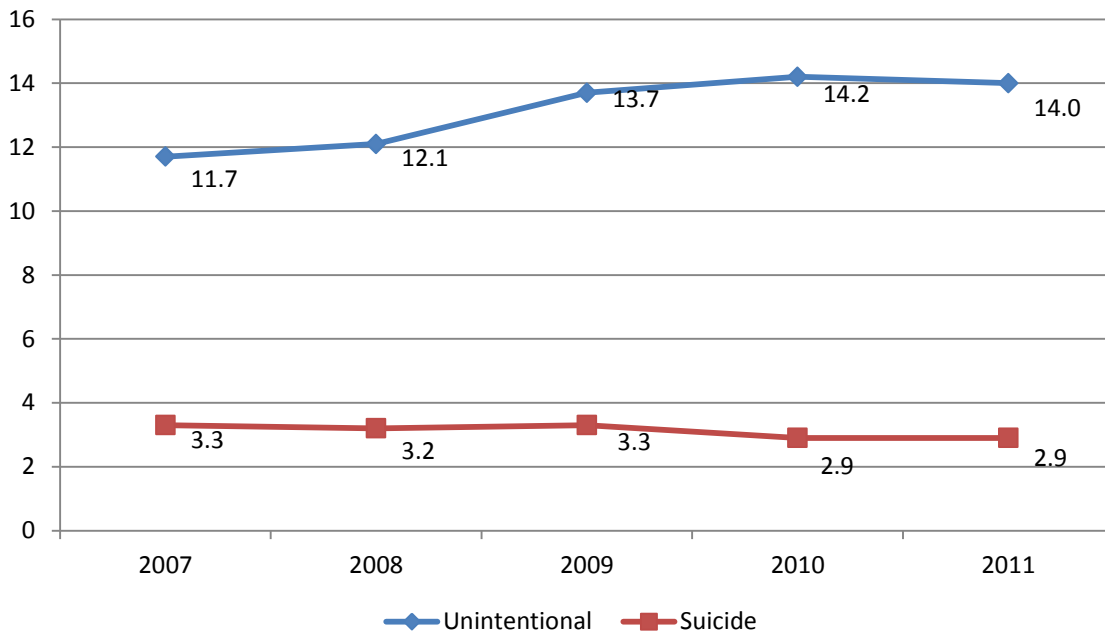
While injuries account for approximately 10 percent of deaths among Arizonans each year, the types of injury have changed over time. Since 2007, the proportion of poisoning-related deaths has increased from 22 percent of all injury-related deaths (n=1,028) to 25 percent of injury-related deaths in 2011 (n=1,144). Over this five-year period, the number of injury-related deaths has decreased slightly, and the increase in poisoning-related deaths was offset by substantial decreases in motor vehicle traffic fatalities. Figure 1 shows the distribution of injury-related deaths by mechanism of injury over the five year period from 2007 through 2011.

**Figure 1. Proportion of Injury-Related Fatalities by Mechanism of Injury
Arizona, 2007-2011**



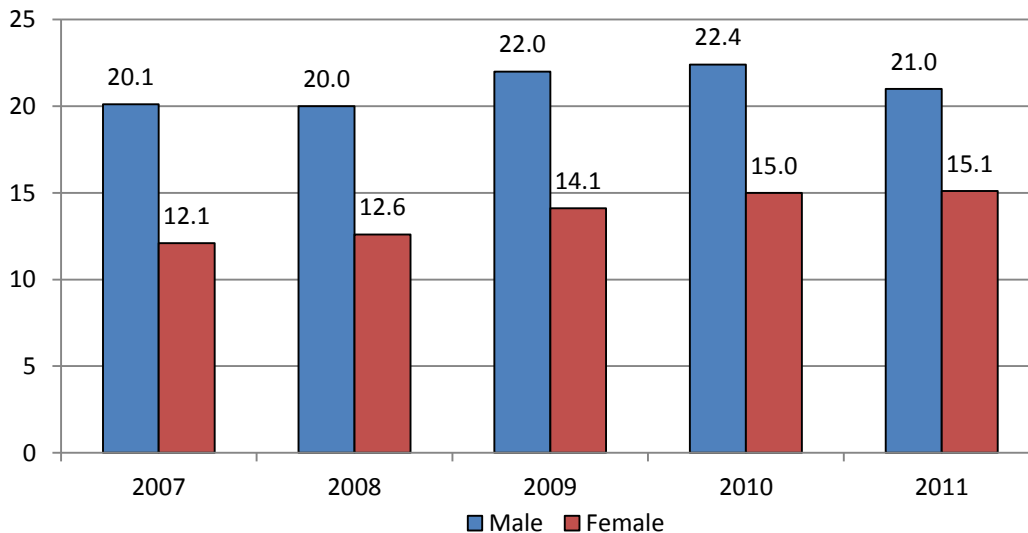
Between 2007 and 2011, the age-adjusted poisoning-related mortality rate increased 12 percent for Arizona residents. This overall increase is almost entirely attributable to the rate of unintentional poisoning deaths, which has increased by 20 percent since 2007. Suicide-related poisonings have remained somewhat stable over time, and in fact have decreased by 12 percent since 2007. Figure 2 shows the age-adjusted poisoning-related mortality rates by manner of death for Arizona residents from 2007 to 2011.

Figure 2. Age-Adjusted Poisoning-Related Mortality Rates per 100,000 Residents by Intent, Arizona 2007-2011



Between 2007 and 2011, the age-adjusted poisoning-related mortality rates increased for both males and females, though the rates for males were consistently higher than those for females. Figure 3 shows the age-adjusted poisoning-related mortality rates by sex for Arizona residents from 2007 to 2011.

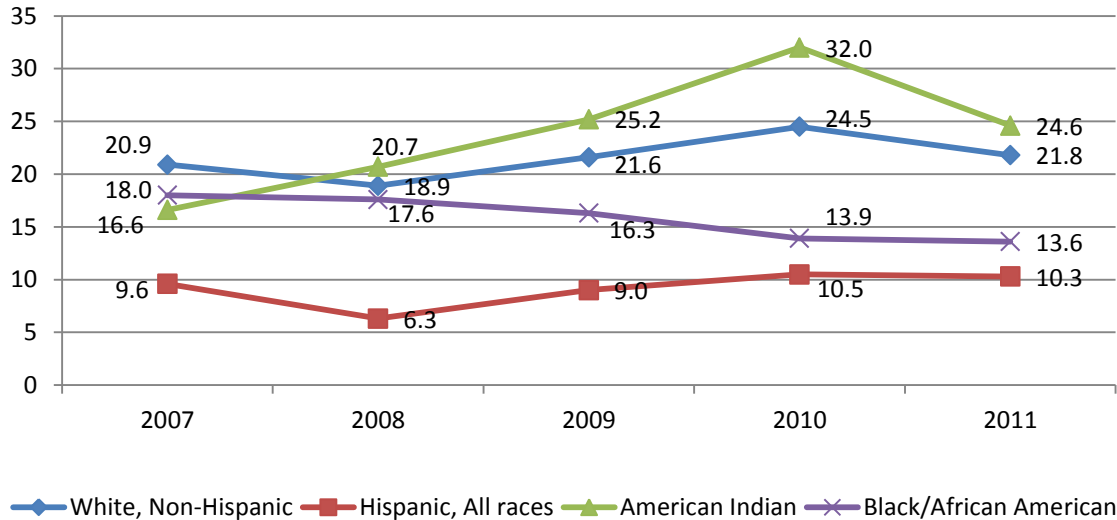
Figure 3. Age-Adjusted Poisoning-Related Mortality Rates per 100,000 Residents by Sex, Arizona 2007-2011



While rates increased among American Indians by 48 percent over the 5-year period, the 2011 rate (24.6 per 100,000) nevertheless represents a 23 percent decrease from 2010, when the mortality rate for this group was at its highest. Conversely, poisoning-related fatality rates among African American Arizonans decreased 24 percent. Figure 4 shows the age-adjusted poisoning-related mortality rates by race/ethnicity for Arizona residents from 2007 to 2011. Due to small numbers, age-adjusted poisoning-related fatality rates have not

been presented for Asian residents. Age-adjusted mortality rates could not be calculated for the 29 poisoning-related deaths among Arizonans of other or unknown race/ethnicities because a denominator could not be characterized.

Figure 4. Age-Adjusted Poison-Related Mortality Rates per 100,000 Residents by Race/Ethnicity, Arizona 2007-2011



Source: WISQARS for 2007-2010 rates, Arizona Vital Statistics for 2011

While the trend is not supported in all counties, the age-adjusted rate of poisoning-related fatalities in Arizona increased between 2007 and 2011. Table 1 shows the age-adjusted fatality rate per 100,000 residents for poisoning-related deaths by county of residence from 2007 to 2011. Ten of the state’s 15 counties had at least one year in which there were fewer than 20 deaths, making those counties’ rates unstable over time.

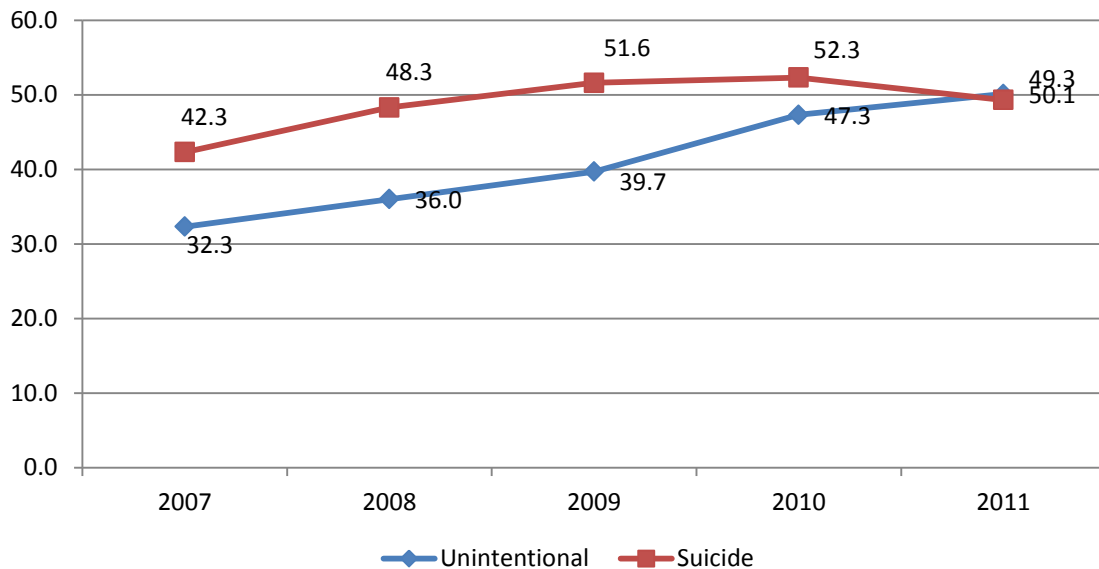
Table 1. Age-Adjusted Fatality Rate per 100,000 Residents for Poisoning-Related Deaths by County of Residence, Arizona 2007-2011					
	2007	2008	2009	2010	2011
Apache*	24.4	23.2	23.1	28.8	23.3
Cochise*	16.8	13.0	17.3	16.6	9.4
Coconino*	9.7	18.6	18.4	18.6	21.0
Gila*	18.6	18.0	27.1	21.2	25.4
Graham*	22.0	14.7	16.5	17.5	19.9
Greenlee*	20.7	10.1	50.1	11.4	16.2
La Paz*	8.2	20.0	25.2	58.4	14.0
Maricopa	16.2	16.0	16.7	16.6	16.7
Mohave	13.7	21.3	31.1	32.0	28.3
Navajo*	16.7	16.5	26.0	25.8	35.1
Pima	17.2	17.7	20.8	22.6	20.7
Pinal	15.5	13.6	13.4	16.3	13.0
Santa Cruz*	4.9	6.7	18.5	7.7	5.5
Yavapai	18.3	20.5	21.1	27.8	31.0
Yuma*	16.3	12.3	13.0	14.0	12.2
Statewide Total	16.1	16.4	18.1	18.7	18.1

*Rates are unstable for counties indicated, as they had fewer than 20 deaths in at least one year.

Non-Fatal Inpatient Hospitalizations

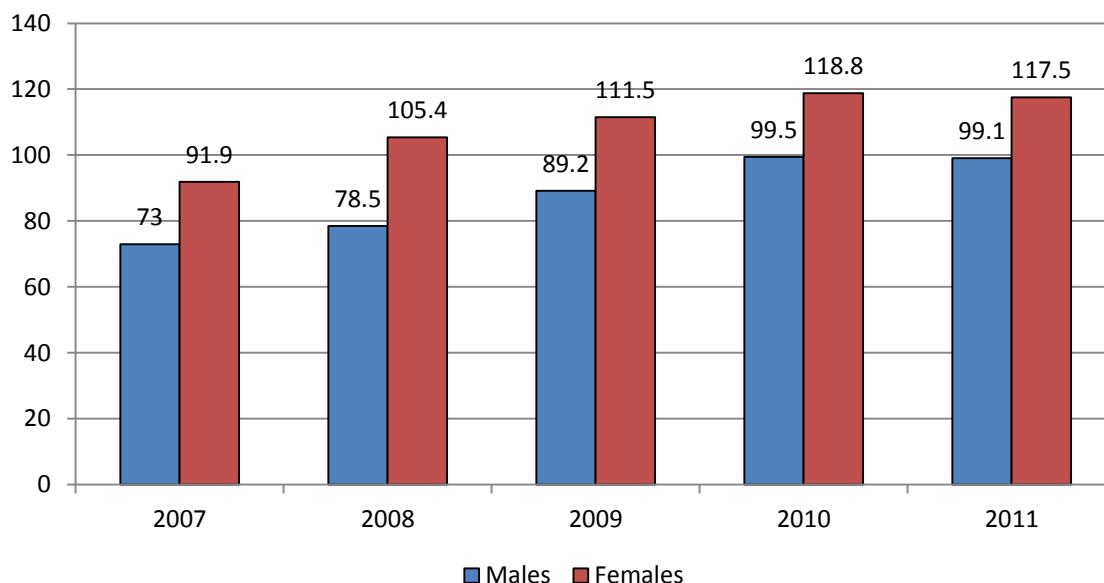
Between 2007 and 2011, the age-adjusted rate of non-fatal poisoning-related inpatient hospitalizations among Arizona residents increased 32 percent, from 82.4 cases per 100,000 residents in 2007 to 108.4 cases in 2011. While the increase was still apparent when hospitalizations were divided by injury intent, cases resulting from unintentional poisonings increased more than cases of self-inflicted poisoning (a 55 percent increase and a 17 percent increase, respectively). It's important to note, however, that there were 573 cases (about 8 percent of all poisoning-related hospitalizations) in which the manner was undetermined. Figure 5 shows the age-adjusted poisoning-related rates for non-fatal inpatient hospitalizations by injury intent for Arizona residents from 2007 to 2011.

Figure 5. Age-Adjusted Poisoning-Related Non-fatal Inpatient Hospitalization Rates per 100,000 residents by Manner, Arizona 2011



While age-adjusted poisoning-related mortality rates were consistently higher among males, similar rates for non-fatal poisoning-related inpatient hospitalizations were higher for females than for males. Rates increased among both males and females during the five years from 2007 through 2011, with a 36 percent increase in the rate among males and a 28 percent increase in the rate among females. Figure 6 shows the age-adjusted rates by sex for non-fatal poisoning-related inpatient hospitalizations from 2007 through 2011.

Figure 6. Age-Adjusted Non-fatal Poisoning-Related Inpatient Hospitalization Rates per 100,000 Residents by Sex, Arizona 2007-2011



The age-adjusted rate of non-fatal poisoning-related inpatient hospitalizations in Arizona increased between 2007 and 2011 among almost all counties with at least 20 hospitalizations in a given year. Yuma County is the exception; the 2011 non-fatal hospitalization rate of 38.9 per 100,000 residents is a 27 percent decrease from 2007, when it was 53.3 per 100,000. Despite its relatively small population, Gila County had a poisoning-related hospitalization rate consistently higher than the remainder of the state. Table 2 shows the age-adjusted fatality rate per 100,000 residents for non-fatal poisoning-related inpatient hospitalizations by county of residence from 2007 to 2011. Four of the state's 15 counties had at least one year in which there were fewer than 20 events, making the rate for that county unstable over time.

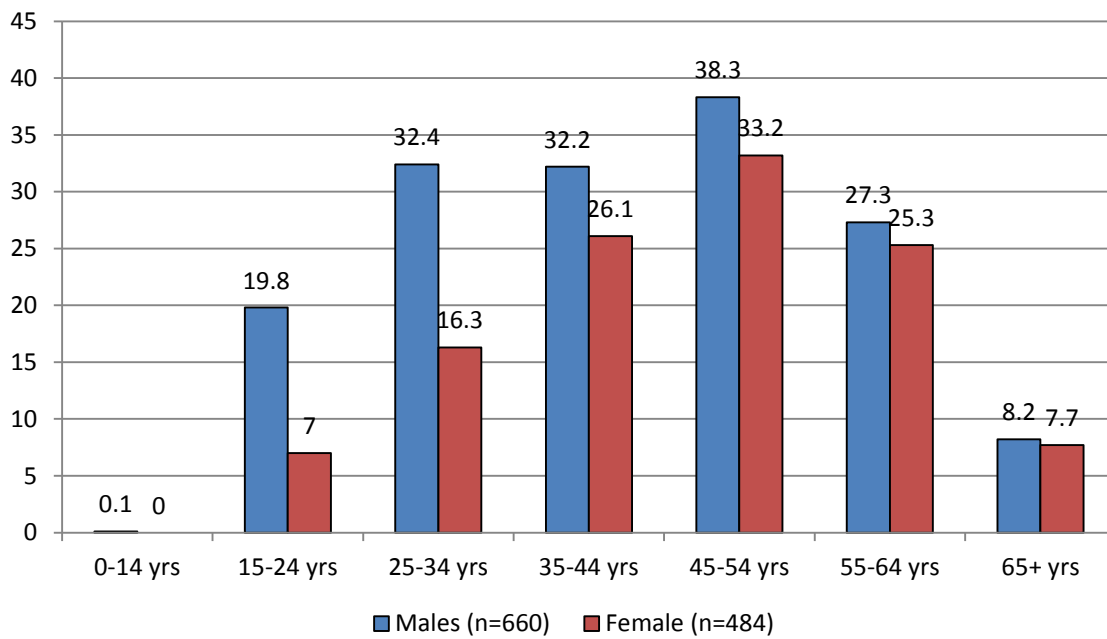
Table 2. Age-Adjusted Rate per 100,000 Residents for Non-Fatal Poisoning-Related Inpatient Hospitalizations by County of Residence, Arizona 2007-2011					
	2007	2008	2009	2010	2011
Apache*	26.8	45.4	55.7	58.4	43.0
Cochise	36.2	53.1	68.3	66.7	73.7
Coconino	60.4	63.1	59.2	73.8	85.2
Gila	92.4	97.8	101.3	129.6	156.0
Graham	114.1	139.2	187.6	157.4	88.4
Greenlee*	54.3	89.9	76.3	37.0	127.2
La Paz*	46.8	39.9	113.5	52.8	68.1
Maricopa	85.4	94.6	102.5	114.5	117.3
Mohave	101.0	104.3	124.9	112.8	123.2
Navajo	56.8	76.6	83.3	95.2	103.9
Pima	92.9	103.6	107.0	116.8	109.6
Pinal	83.1	90.9	117.0	109.3	92.3
Santa Cruz*	31.5	44.2	47.6	48.9	59.3
Yavapai	75.5	74.2	78.3	105.3	85.4
Yuma	53.3	67.4	68.8	67.9	38.9
Statewide Total	82.4	91.9	100.3	109.2	108.4

*Rates are unstable for counties indicated, as they had fewer than 20 cases in at least one year.

Poisoning-Related Mortality, 2011

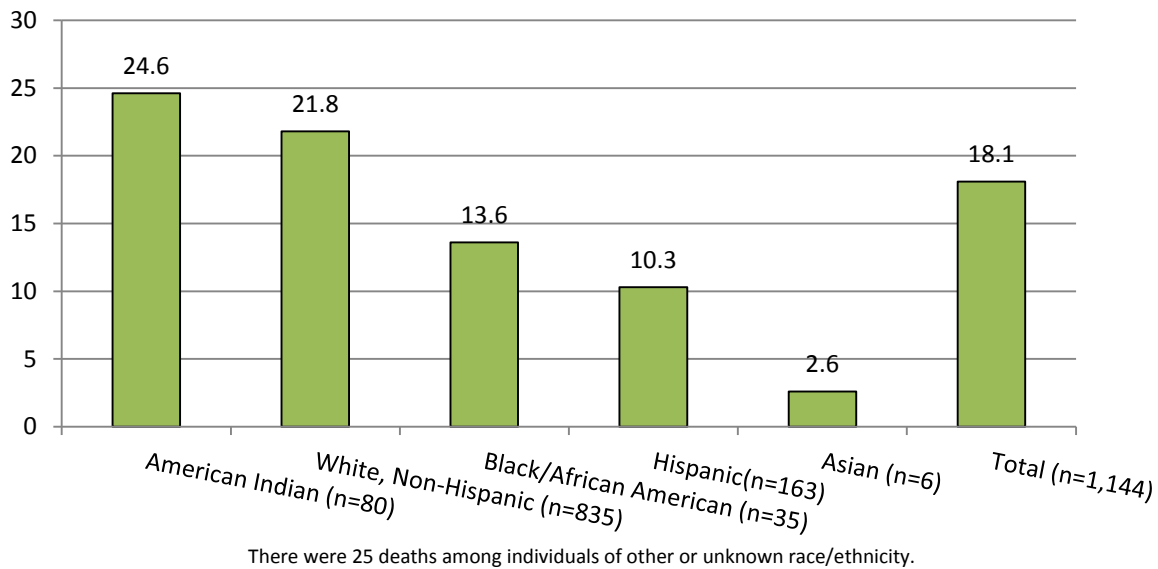
There were 1,144 deaths among Arizona residents attributed to poisoning in 2011. Fifty-eight percent of deaths were among males (n=660), and 42 percent were among females (n=484). In 2011, the age-adjusted poisoning mortality rate among Arizona females was 15.1 deaths per 100,000 residents; the rate among males was 39 percent higher (21.0 deaths per 100,000 residents). When looking at poisoning deaths by age group, males had higher mortality rates than females in each age group, though the ratio of deaths among males and females varied. Adults 45 through 54 years of age had the highest rate of fatalities among both males and females, although young adult males between 25 and 34 years of age had a notably high rate. Young adults in this age group had the highest ratio of deaths among males versus females. Deaths among males 15 through 24 years outnumbered those among females in that age group by a factor of 2. Figure 8 shows the poisoning-related mortality rates per 100,000 Arizona residents by age group and sex.

Figure 8. Poisoning Mortality Rates per 100,000 Residents by Age Group and Sex, Arizona 2011



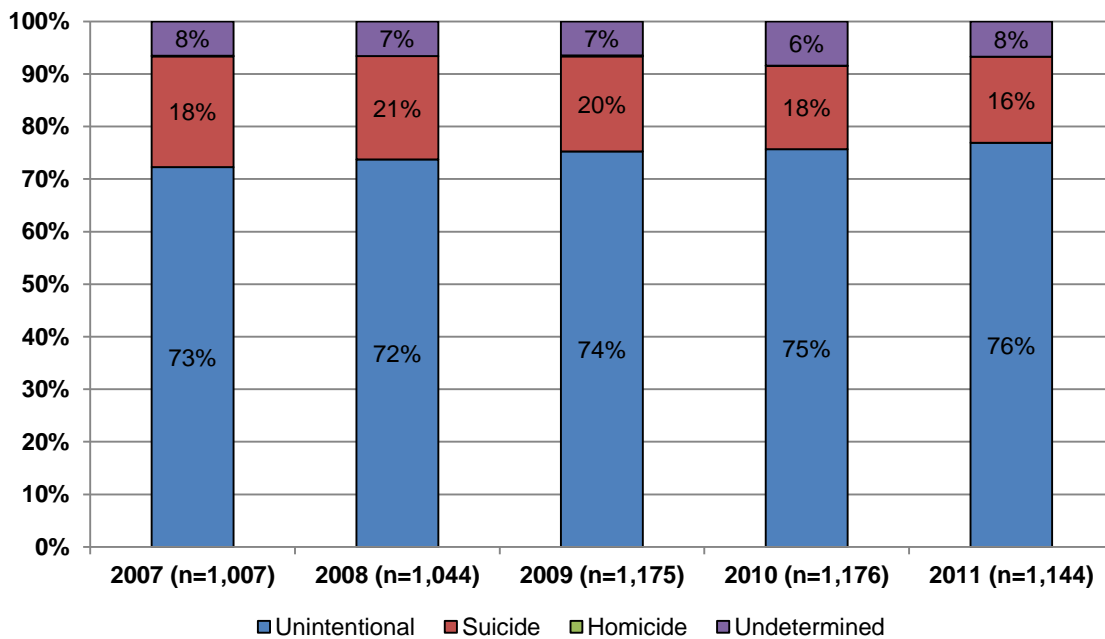
American Indian residents had the highest age-adjusted poisoning-related mortality rate in 2011 (24.6 deaths per 100,000 residents), followed closely by White, non-Hispanic residents (21.8 deaths per 100,000 residents). Hispanic Arizonans had the lowest stable poisoning-related mortality rate in 2011 with 10.3 deaths per 100,000 residents. Though Asian residents had a very low mortality rate, the rate is not stable due to the low number of deaths. Figure 9 shows the age-adjusted poisoning-related mortality rates by race/ethnicity for Arizona residents in 2011.

Figure 9. Age-Adjusted Poisoning-Related Mortality Rate per 100,000 Residents by Race/Ethnicity, Arizona 2011



As in previous years, the majority of poisoning-related deaths were determined to be unintentional. In 2011, 77 percent of poisoning-related deaths among Arizona residents were unintentional (n=880). With 187 suicides, 2011 had the lowest percentage of poisoning-related suicide deaths in any year from 2007 through 2011. Figure 10 shows the proportion of poisoning-related deaths by manner in each year from 2007 through 2011.

Figure 10. Proportion of Poisoning-Related Fatalities by Intent, Arizona, 2007-2011



Every poisoning-related fatality has its own circumstances, including the type of poison used. Multiple drugs may be listed as contributing to a single death. Table 3 lists the poisons most commonly specified on the 2011 death certificates. Because some death certificates may simply state that the cause of death was a “drug

overdose” or “combined drug intoxication”, the figures listed below may be an underestimate of the number of deaths involving a particular substance.

Table 3. Poisons Commonly Listed on Death Certificates, Arizona 2007-2011

Poisons*	2007 (n=1,007)		2008 (n=1,044)		2009 (n=1,175)		2010 (n=1,176)		2011 (n=1,144)	
	#	%	#	%	#	%	#	%	#	%
Alcohol	155	15%	186	18%	155	15%	186	18%	186	16%
Benzodiazepines	54	5%	97	9%	54	5%	97	9%	99	9%
Carbon Monoxide	36	4%	41	4%	36	4%	41	4%	16	1%
Carisoprodol	10	1%	15	1%	10	1%	15	1%	12	1%
Cocaine	125	12%	87	8%	125	12%	87	8%	59	5%
Diphenhydramine	22	2%	30	3%	22	2%	30	3%	18	2%
Fentanyl	22	2%	37	4%	22	2%	37	4%	21	2%
Helium	5	<1%	6	1%	5	<1%	6	1%	10	1%
Heroin	56	6%	67	6%	56	6%	67	6%	120	10%
Methadone	79	8%	105	10%	79	8%	105	10%	53	5%
Methamphetamine	104	10%	91	9%	104	10%	91	9%	116	10%
Morphine	81	8%	115	11%	81	8%	115	11%	101	9%
Oxycodone/Hydrocodone	119	12%	162	16%	119	12%	162	16%	175	15%
Serotonin-Norepinephrine Reuptake Inhibitors (SNRIs)	10	1%	11	1%	10	1%	11	1%	14	1%
Selective Serotonin Reuptake Inhibitors (SSRIs)	44	4%	55	5%	44	4%	55	5%	49	4%
Tramadol	13	1%	10	1%	13	1%	10	1%	15	1%

*More than one poison may have been identified for each death

In the past, poisoning-related deaths were known to be unevenly distributed throughout the week. If deaths were distributed evenly among days and months, each day would contain 14.3 percent of the deaths and each month would contain 8.3 percent of the deaths. In 2011, Saturdays, Sundays, and Mondays had the highest number of deaths, 15 percent each, (n=175, 174, 173, respectively), and Tuesdays had the lowest number of deaths, accounting for 12.9 percent (n=152). However, these differences are not statistically significant.

Poisoning fatalities were distributed among residents of Arizona’s counties as shown in Figure 14. While this report does not examine the distribution of mortality across counties by type of substance, results of such an analysis from New Mexico suggest that unintentional deaths resulting from illegal drugs were more prevalent in urbanized areas, and deaths from prescription drugs were more common in suburban or rural settings.⁵

Poisoning Fatalities by Manner

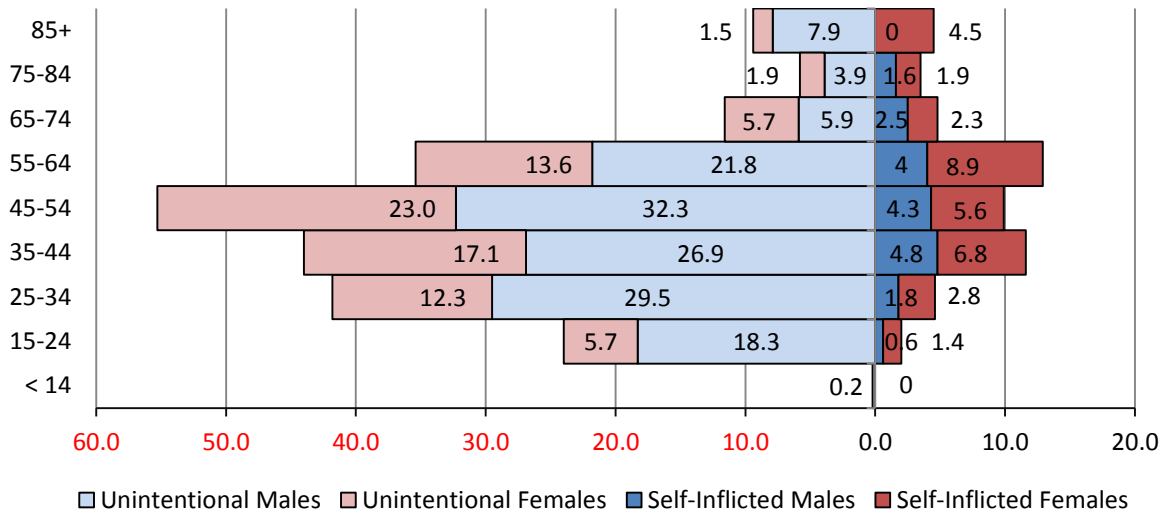
There were 880 unintentional poisoning deaths in 2011 (76 percent), 64 percent were among males (n=563), and 36 percent were among females (n=317). In 2011, only 1 unintentional poisoning-related death occurred among children 4 years and younger; there were no deaths among children ages 5 through 14 years. There were 187 poisoning-related suicides in 2011 (16 percent), 62 percent of which were among females (n=116). There were no poisoning-related suicides among either sex below the age of 15 years.

In 2011, Males aged 45 through 54 years had the highest mortality rate for unintentional poisoning-related deaths (32.3 deaths per 100,000 residents), although young adult males ages 25 through 34 had high mortality rates (29.5 deaths per 100,000 residents). Females had higher poisoning-related suicide rates in all age groups,

⁵ CDC. Unintentional Deaths from Drug Poisoning by Urbanization of Area – New Mexico, 1994-2003. MMWR 2005; 54(35):870-873.

and the highest rate was among females 55 through 64 years of age (8.9 suicides per 100,000 residents). Figure 11 shows the death rates for poisonings by age group, manner, and sex per 100,000 Arizona residents in 2011.

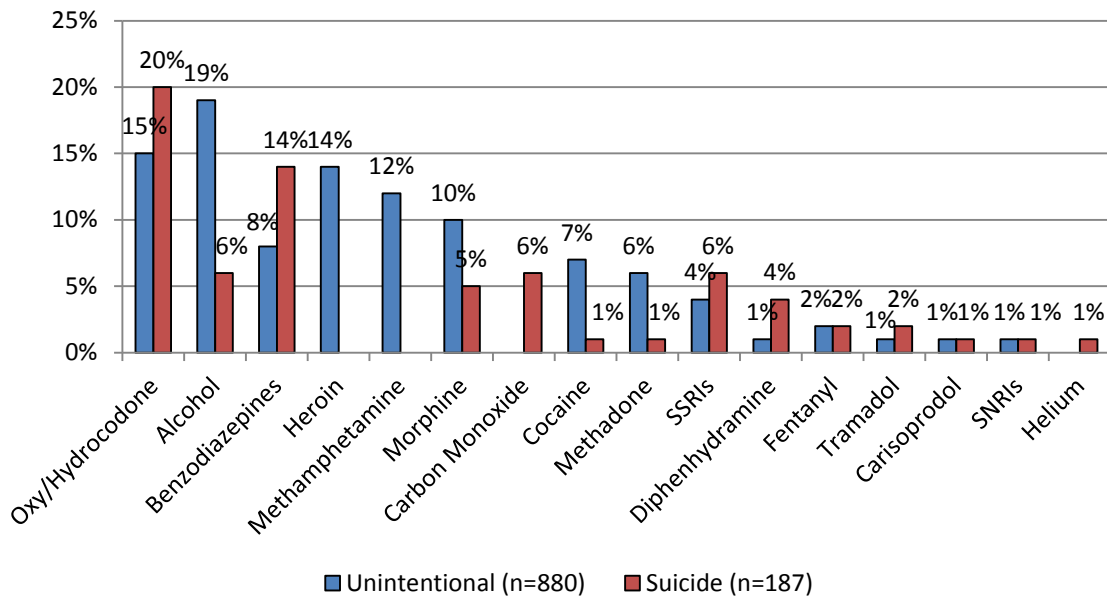
Figure 11. Age-specific Poisoning-Related Mortality Rates per 100,000 Residents by Age, Sex, and Manner, Arizona 2011 (n=1,067*)



*Does not include 77 deaths due to undetermined manner

Figure 12 shows the poisons most commonly specified on the 2011 death certificates for both manners of poisoning-related fatalities. Because there were so many more unintentional deaths than suicides, the poisons are shown in percent rather than count. Given that more than one poison may be listed on a death certificate, the percent values will not add up to 100. Because some death certificates may simply state that the cause of death was a “drug overdose” or “combined drug intoxication”, the figures listed below may be an underestimate of the number of deaths involving a particular substance.

Figure 12. Poisons Commonly Listed on Death Certificates (%), by Drug Type, Arizona 2011*



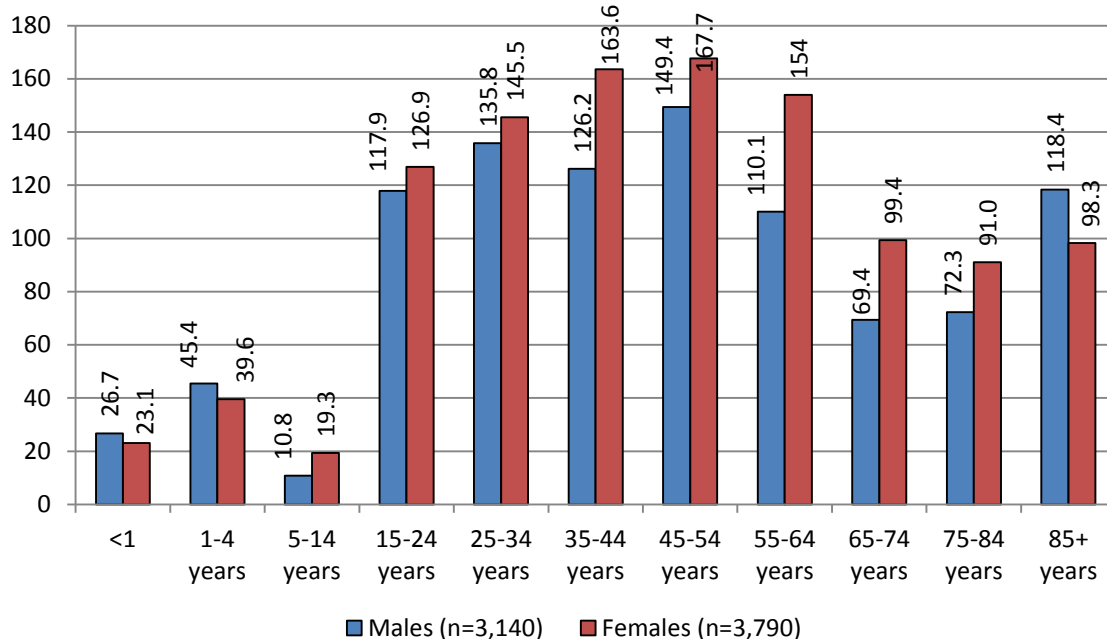
*More than one poison may have been listed for each death

Non-Fatal Poisoning-Related Inpatient Hospitalizations, 2011

There were 6,930 non-fatal inpatient hospitalizations among Arizona residents attributed to poisoning in 2011, and an age-adjusted rate of 108.4 per 100,000 residents. Forty-five percent of the events were among males (n=3,140), and 55 percent were among females (n=3,790). Unintentional and self-inflicted poisonings accounted for 92 percent of non-fatal poisoning-related inpatient hospitalizations, but neither category accounted for a majority of cases. Forty-seven percent of inpatient hospitalizations were attributed to unintentional poisonings (n=3,280), 44 percent resulted from self-inflicted poisonings (n=3,076), poisonings of undetermined intent accounted for eight percent of hospitalizations (n=573), and there was one visit due to poisoning-related assaults or other intents (legal intervention).

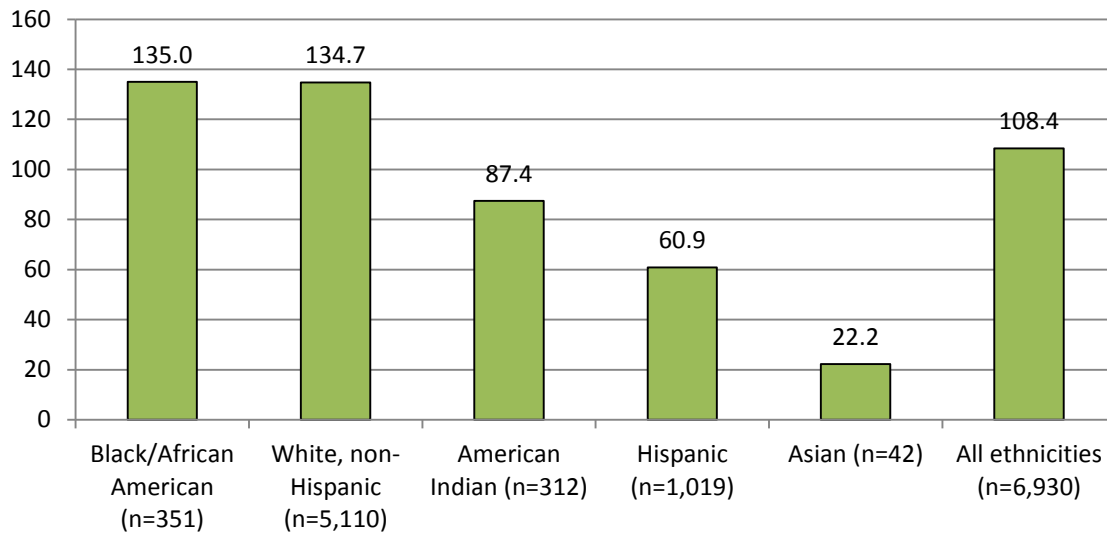
Except for children and infants up to four years of age and adults over 85 years, females had higher rates of non-fatal inpatient hospitalizations than males across the lifespan. The 45 through 54 year age group had the highest rate among both males and females. Figure 13 shows the non-fatal poisoning-related inpatient hospitalization rates per 100,000 Arizona residents by age group and sex.

Figure 13. Non-fatal Poisoning-Related Inpatient Hospitalization Rates per 100,000 residents, by Sex, Arizona 2011



African-American residents had the highest age-adjusted poisoning-related rate of non-fatal inpatient hospitalizations in 2011 (135.0 per 100,000) followed very closely by white, non-Hispanic Arizona residents (134.7 cases per 100,000 residents). Asian residents had the lowest poisoning-related rate of non-fatal inpatient hospitalizations in 2011 with 22.2 cases per 100,000 residents. Figure 14 shows the age-adjusted non-fatal poisoning-related inpatient hospitalization rates by race/ethnicity for Arizona residents in 2011.

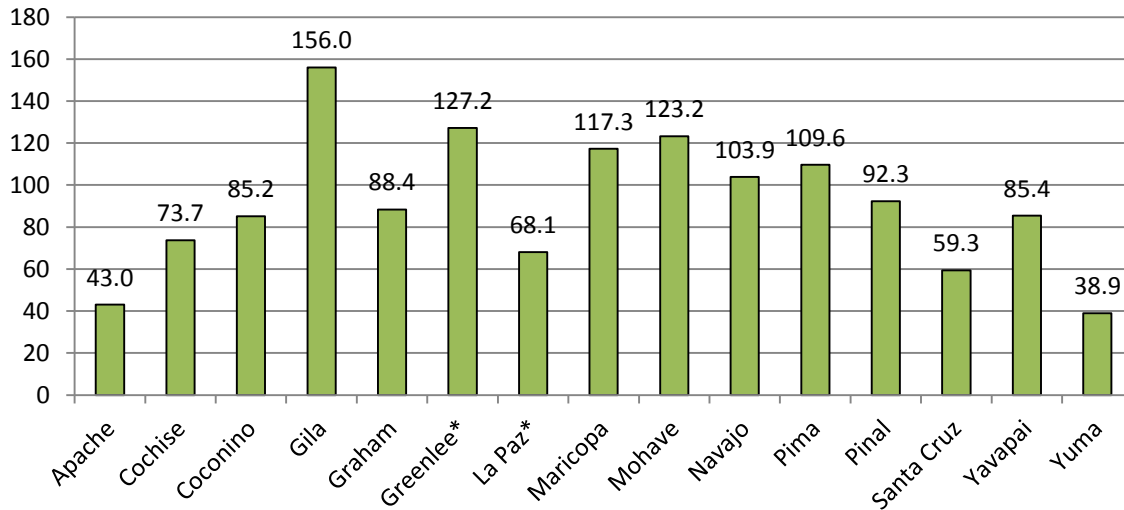
Figure 14. Age-Adjusted Non-Fatal Poisoning-Related Inpatient Hospitalization Rate per 100,000 by Race/Ethnicity, Arizona 2011



There were 96 hospitalizations among individuals of other or unknown race/ethnicity.

Gila County had the highest rate of inpatient hospitalizations for non-fatal poisonings in 2011, with 156 cases per 100,000 county residents. However, Mohave County was the only county to rank among the five counties with the highest rate of poisonings for both fatalities and non-fatal hospitalizations. The number and rate of non-fatal poisoning-related inpatient hospitalizations were distributed among residents of Arizona’s counties as shown in Figure 15.

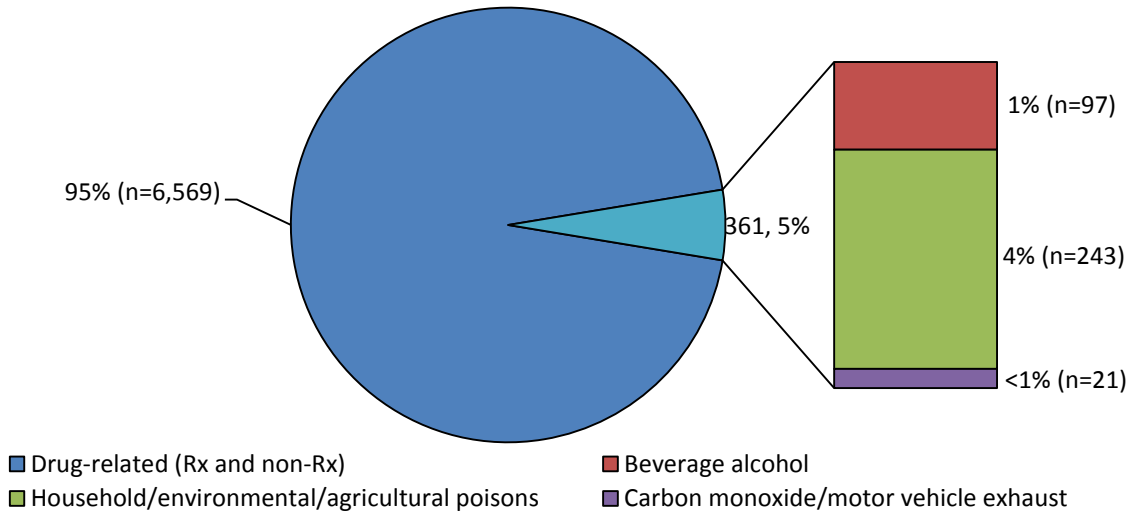
Figure 15. Age-adjusted Non-Fatal Poisoning-Related Inpatient Hospitalization Rates per 100,000 residents by County, Arizona 2011



*Rates are unstable due to low counts (n<20); Does not include 1 case with unknown county information

Among all manners of non-fatal poisoning-related inpatient hospitalization, 95 percent were due to overdoses of a drug or medication. This percentage includes both prescription and non-prescription drugs. Unfortunately, the lack of specificity in the data on drug type makes further analysis impossible for 2011 data.

Figure 16. Non-fatal Poisoning-Related Inpatient Hospitalizations by Poison Type, Arizona 2011 (n=6,930)

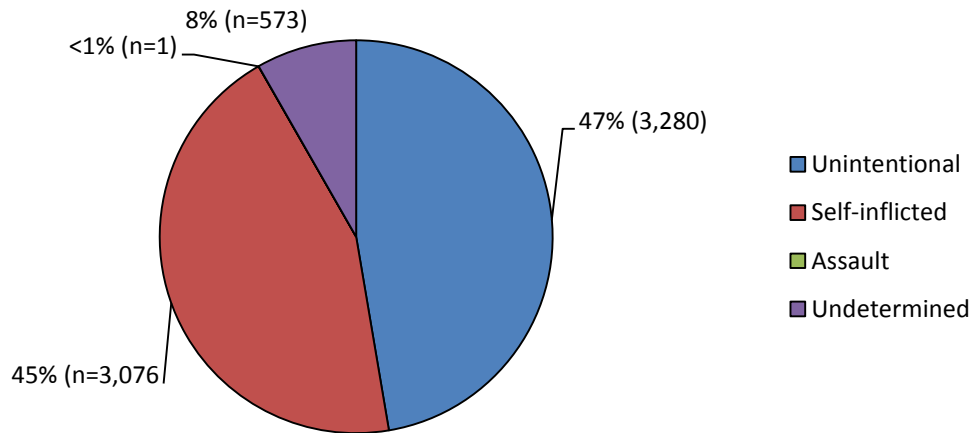


In 2011, the average non-fatal poisoning-related inpatient hospitalization totaled \$28,722 in hospital charges and lasted for 3 days (median = \$19,277, 2 days). Arizona residents spent a total of 13,822 days in the hospital for non-fatal poisoning-related events. The longest hospital stay for a non-fatal case was 195 days. Hospital charges for non-fatal inpatient hospitalizations due to poisonings totaled over \$127 million for Arizona residents in 2011. The single most costly hospitalization totaled \$553,651 in hospital charges. Fifty-seven percent of hospital fees for non-fatal poisoning-related inpatient hospitalizations were reportedly paid by Medicare or the Arizona Health Care Cost Containment System (AHCCCS), (3,958 cases; more than \$114.8 million). Hospital charges do not reflect hospital reimbursement rates, nor do they include charges or costs related to emergency medical services, outpatient care, rehabilitation, legal fees, or lost work or school time.

Non-Fatal Poisoning-Related Inpatient Hospitalizations by Manner

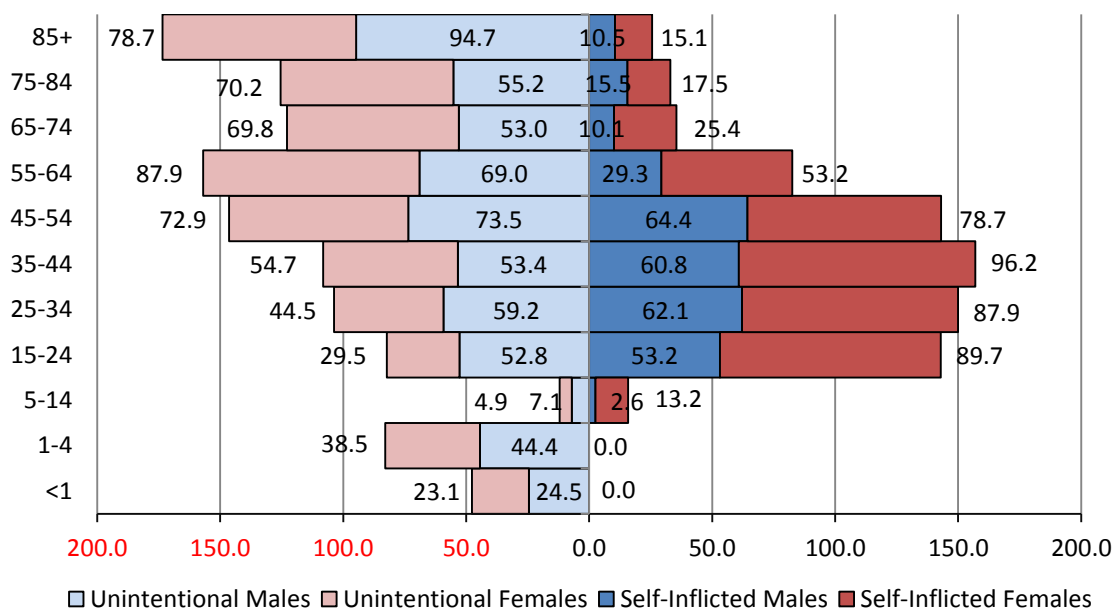
There were 3,280 non-fatal inpatient hospitalizations among Arizona residents attributed to unintentional poisoning in 2011 (47 percent) and 3,076 hospitalizations attributed to intentional self-inflicted poisoning (45 percent). Because the vast majority of hospitalizations fall into one of these two categories, the following section will focus on unintentional and self-inflicted non-fatal poisoning-related hospitalizations. Figure 17 shows the distribution of non-fatal poisoning-related inpatient hospitalizations by manner.

Figure 17. Non-Fatal Poisoning-Related Inpatient Hospitalizations by Manner, Arizona 2011 (n=6,930)



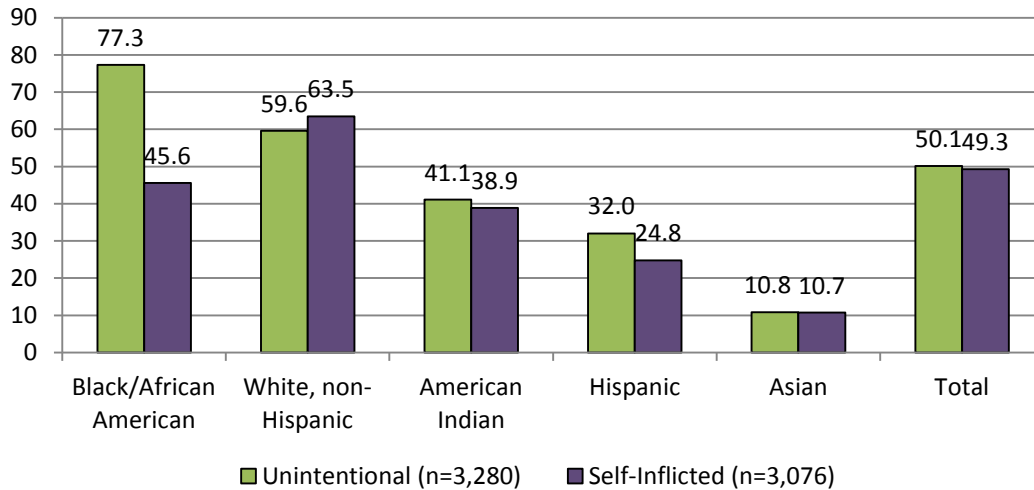
Unintentional poisoning-related hospitalizations were evenly distributed between males and females (50 percent each) whereas females represented a greater percentage of self-inflicted poisoning-related hospitalizations (61 percent, n=1,866). Female residents aged 35 through 44 years had the highest rate of self-inflicted non-fatal poisoning-related inpatient hospitalizations of any age group (96.2 per 100,000) in 2011. Male residents 85 and older had the highest rate of unintentional poisoning-related hospitalization (94.7 per 100,000). In general, the highest rates of self-inflicted poisoning-related hospitalizations were among adults and teenagers aged 15-54, whereas unintentional poisonings were highest among the oldest age groups. Unsurprisingly, there were no self-inflicted poisoning-related hospitalizations among children under 5 years of age. Figure 18 shows the non-fatal poisoning-related inpatient hospitalization rates per 100,000 Arizona residents by age group and sex, separated by manner.

Figure 18. Age-specific Non-Fatal Poisoning-Related Inpatient Hospitalization Rates per 100,000 Residents by Age, Sex, and Manner, Arizona 2011 (n=6,356)



African American Arizona residents had the highest age-adjusted non-fatal unintentional poisoning-related inpatient hospitalization rate in 2011 (77.3 cases per 100,000 residents), followed by White, non-Hispanic residents (59.6 cases per 100,000 residents). Conversely, White, non-Hispanic residents had the highest age-adjusted non-fatal self-inflicted poisoning-related hospitalization rate (63.5 per 100,000 residents) followed by African Americans (45.6 per 100,000 residents). Asian residents had the lowest age-adjusted non-fatal inpatient hospitalization rates for both manners of poisoning. Figure 19 shows the age-adjusted non-fatal unintentional poisoning-related inpatient hospitalization rates by race/ethnicity for Arizona residents in 2011.

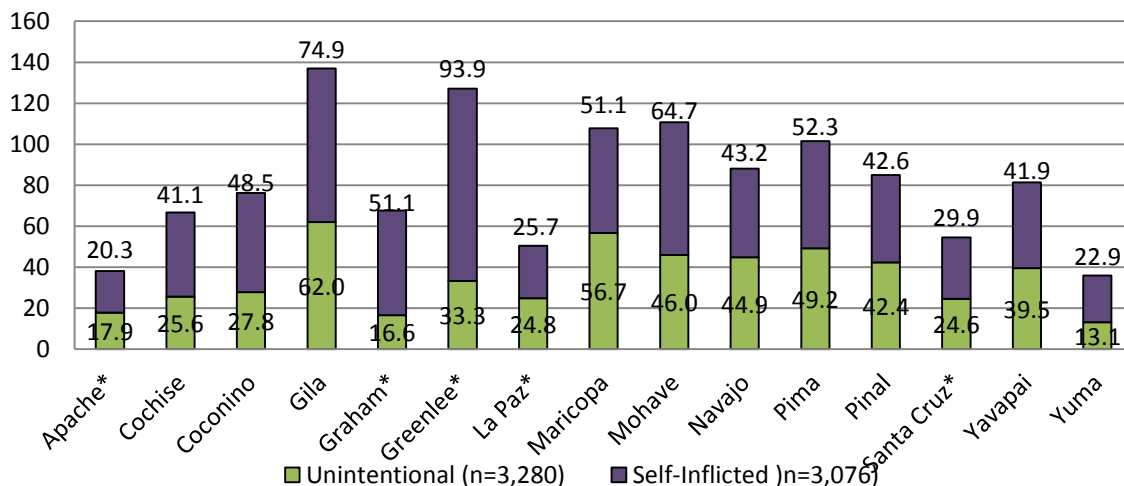
Figure 19. Age-Adjusted Non-Fatal Poisoning-Related Inpatient Hospitalizations Rates per 100,000 Residents by Race/Ethnicity and Manner, Arizona 2011



There were 96 hospitalizations among individuals of other or unknown race/ethnicity.

Gila County had the highest non-fatal inpatient hospitalization rates for both unintentional and self-inflicted poisonings (62.0 per 100,000 residents and 74.9 per 100,000 residents, respectively). Although Greenlee’s hospitalization rate for self-inflicted injuries appears high, the overall count for that county is too low to calculate a reliable rate. Non-fatal poisoning-related inpatient hospitalizations were distributed among residents of Arizona’s counties as shown in Figure 20.

Figure 20. Age-Adjusted Non-Fatal Poisoning-Related Inpatient Hospitalizations by County and Manner, Arizona 2011

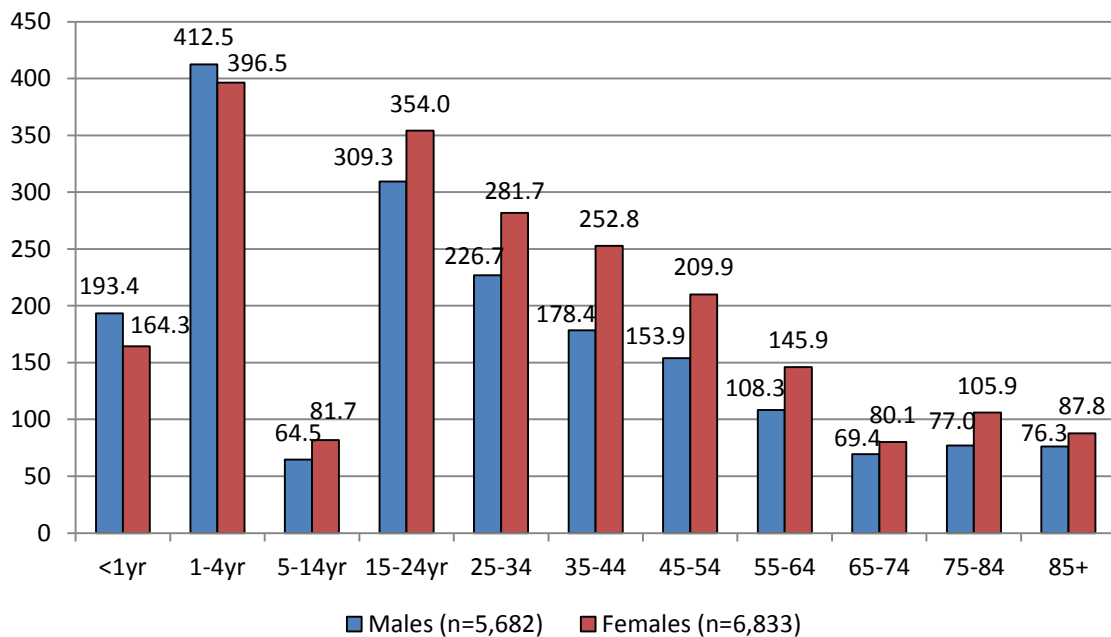


*Rates are unstable due to low counts (n<20)

Non-Fatal Poisoning-Related Emergency Department Visits, 2011

There were 12,516 non-fatal emergency department visits among Arizona residents attributed to non-fatal poisoning in 2011. Forty-five percent of the visits were among males (n=5,682), and 55 percent were among females (n=6,833). Except for children under five years, females had higher rates of non-fatal emergency department visits than males. Children one through four years of age one had the highest rate of emergency department visits among both sexes and the 15 to 24 year age group had the highest rate among adult females. One study has shown that a substantial proportion of young children brought to an urban tertiary-care emergency department with apparent life-threatening events had positive toxicology screenings, even when parents denied medicating the child.⁶ Though the rate of non-fatal poisoning events among Arizona's young children is very high, the results of that study suggest that the rate may be higher still if all young children presenting in the emergency department with an apparent life-threat were screened for potential poisons. Figure 21 shows the non-fatal poisoning-related emergency department visits rates per 100,000 Arizona residents by age group and sex.

Figure 21. Age-Specific Rates of Non-Fatal Poisoning-Related Emergency Department Visits by Age and Sex, Arizona 2011 (n=12,515*)

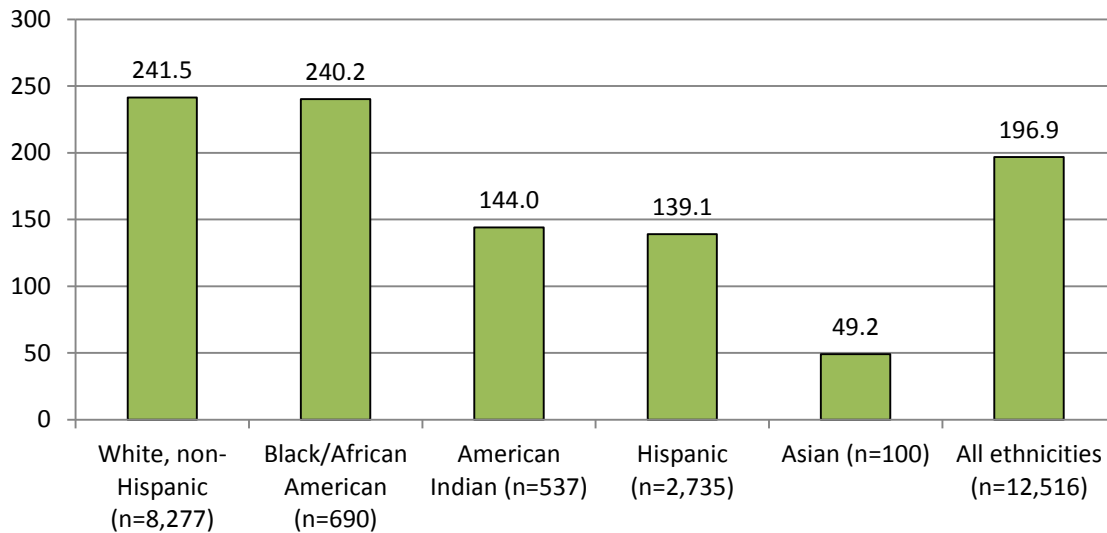


*Excludes one individual of unknown sex

White, non-Hispanic Arizonans had the highest age-adjusted rate of non-fatal poisoning-related emergency department visits (241.5 per 100,000 residents, n=8,277) followed closely by African American Arizonans (240.2 per 100,000 residents, n=690). As with inpatient hospitalizations, the lowest rate was among Asian Americans (49.2 per 100,000 residents). Figure 22 shows the rate distribution of emergency department visits in 2011.

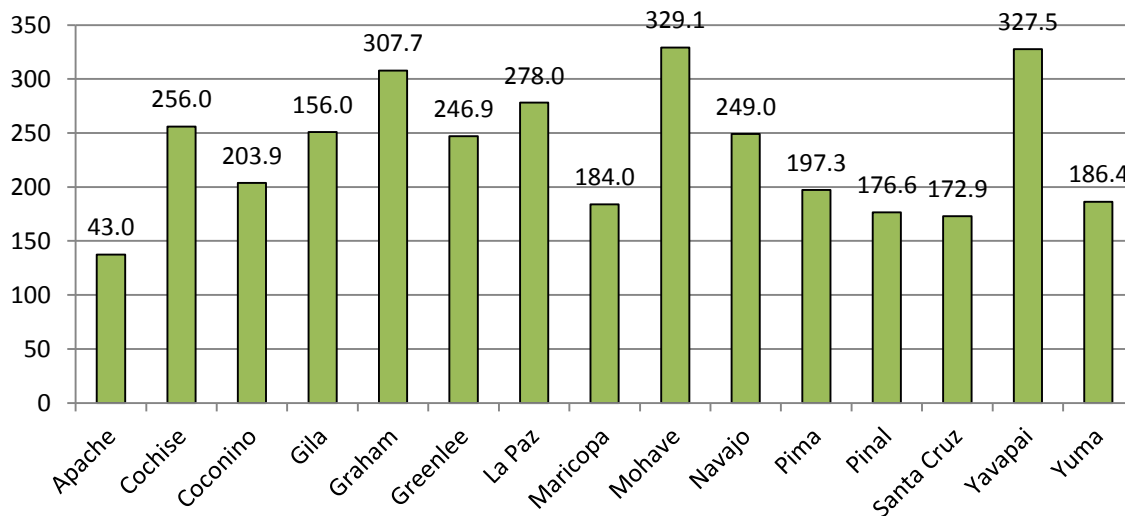
⁶ Pitetti RD, Whitman E, Zaylor A. Accidental and Nonaccidental Poisonings as a Cause of Apparent Life-Threatening Events in Infants. *Pediatrics* 2008; 122:e539-e362.

Figure 22. Age-Adjusted Non-Fatal Poisoning-Related Emergency Department Visit Rates per 100,000 Residents by Race/Ethnicity, Arizona 2011 (n=12,516)



Mohave County had the highest rate of non-fatal poisoning-related emergency department visits in 2011 (329.1 visits per 100,000 residents, n=581), followed closely by Yavapai County (327.5 per 100,000 residents, n=581). It is notable that although several counties had unstable rates for deaths and hospitalizations, all Arizona counties had enough emergency department visits to generate rates that are stable and comparable to others. Non-fatal poisoning-related emergency department visits were distributed among residents of Arizona’s counties as shown in Figure 23.

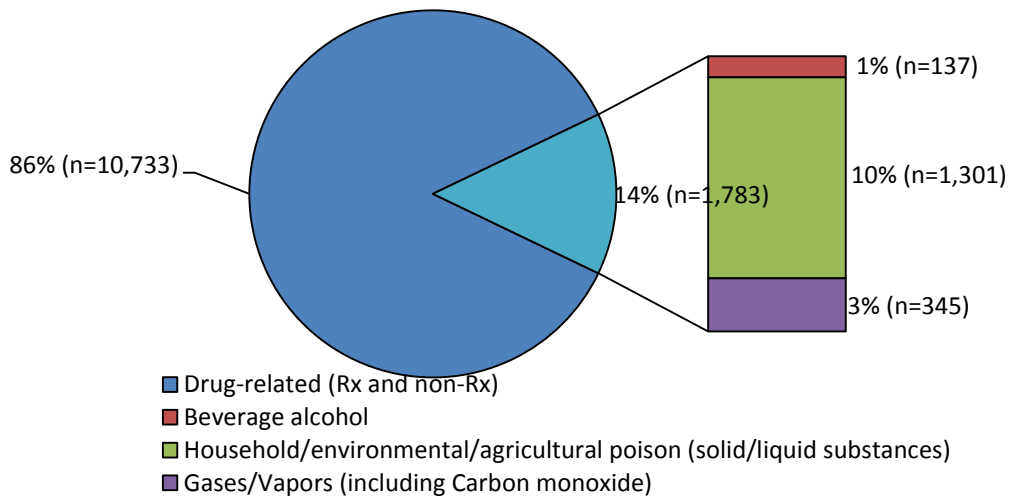
Figure 23. Age-Adjusted Non-Fatal Poisoning-Related Emergency Department Visits by County, Arizona 2011 (n=12,513*)



*Excludes 3 individuals with unknown county information

As with hospitalizations, the vast majority of non-fatal poisoning-related emergency department visits were due to drugs (86 percent, n=10,733). Because of the number of unspecified drugs in the data, however, we are unable to show specifically whether these were predominantly prescription or non-prescription drugs. The distribution of emergency visits by poison type is shown in Figure 24.

Figure 24. Non-Fatal Poisoning-Related Emergency Department Visits by Poison Type, Arizona 2011 (n=12,516)

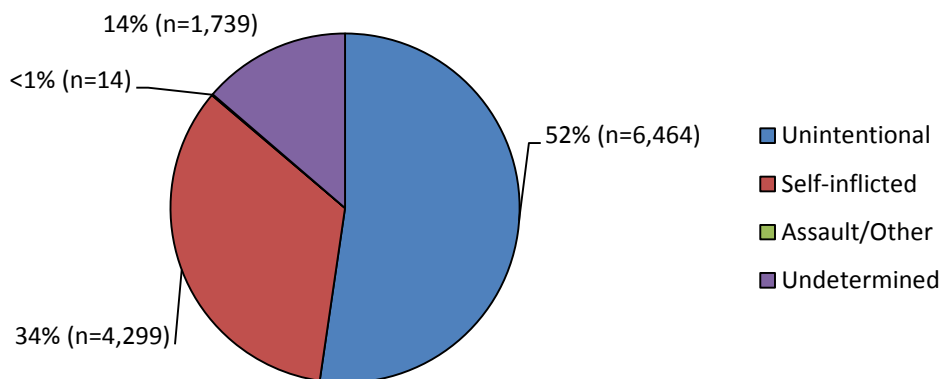


In 2011, the average non-fatal poisoning-related emergency department visit resulted in \$4,502 in hospital charges (median=\$4,000). Hospital charges for non-fatal emergency department visits due to poisonings among Arizona residents totaled more than \$56.3 million in 2011. Fifty-four percent of those hospital charges were reportedly paid by Medicare or the Arizona Health Care Cost Containment System (AHCCCS) (6,765 visits; more than \$30.2 million). The single most costly emergency department visit resulted in \$52,176 in hospital charges. Hospital charges do not reflect hospital reimbursement rates, nor do they include charges or costs related to emergency medical services, rehabilitation, legal fees, or lost work or school time.

Non-Fatal Poisoning-Related Emergency Department Visits by Manner

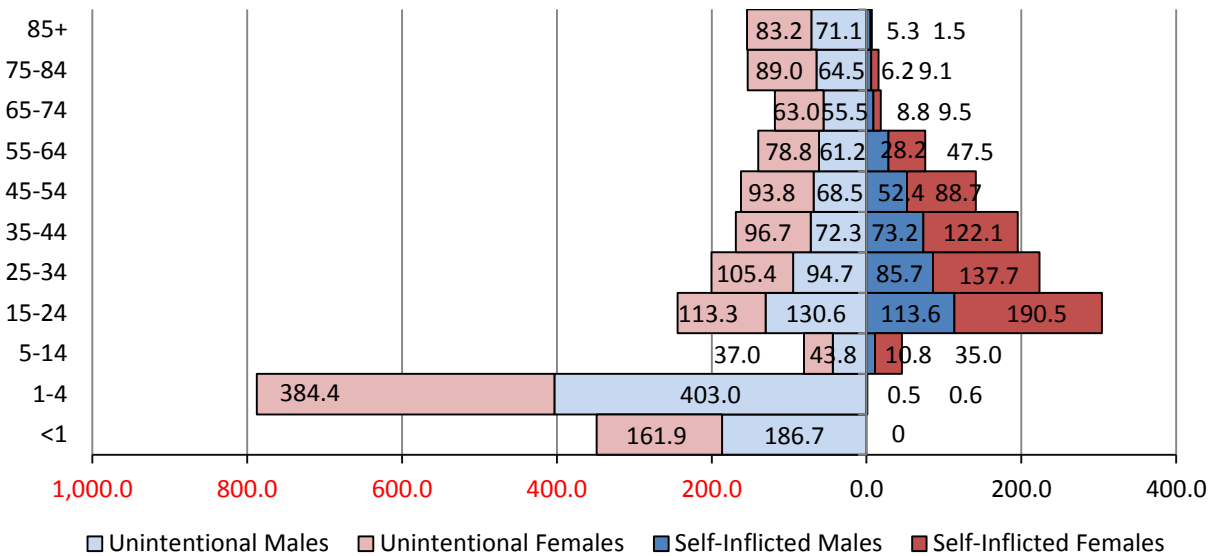
Unlike the distribution among inpatient hospitalizations, a slight majority of non-fatal poisoning-related emergency department visits were identified as being unintentional injuries (52 percent, n=6,464). Thirty-four percent of emergency department visits were attributed to self-inflicted poisonings (n=4,299), poisonings of undetermined intent accounted for 14 percent of visits (n=1,739), and there were 14 visits from poisonings due to assaults or other intents (legal intervention). Figure 25 shows the distribution of non-fatal emergency department visits by manner.

Figure 25. Non-Fatal Poisoning-Related Emergency Department Visits by Manner, Arizona 2011 (n=12,516)



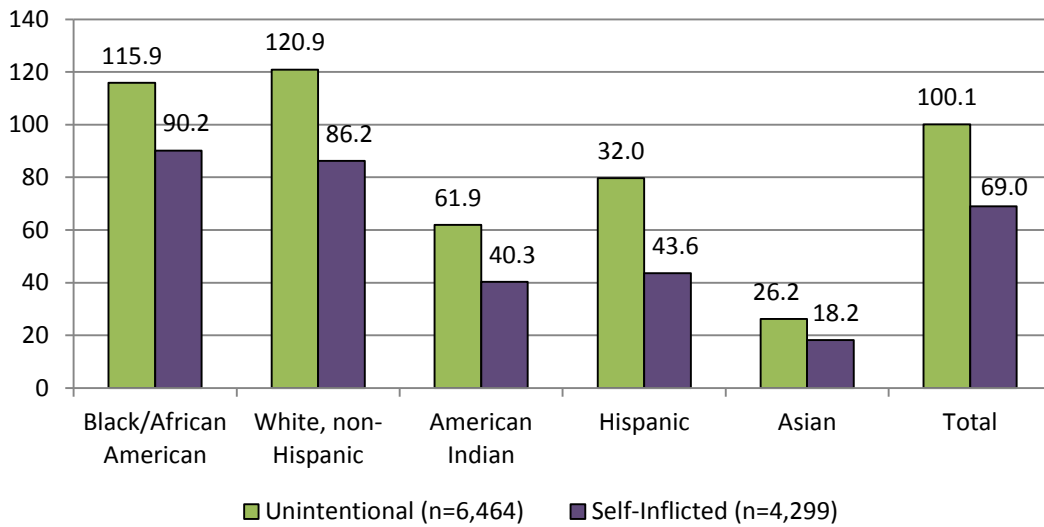
Children younger than five years of age had the highest rates of non-fatal unintentional poisoning-related emergency department visits among both males and females (403.0 per 100,000 residents and 384.4 per 100,000 residents, respectively). Females had higher rates of non-fatal, unintentional poisoning-related emergency department visits among Arizona residents in each age group 25 years and older. Females in all age groups had higher rates of self-inflicted poisoning-related visits, with the highest rate being among females aged 15 through 24 (190.5 per 100,000). This age group also represented the highest rate among males (113.6 per 100,000 residents). Figure 26 shows the non-fatal poisoning-related emergency department visit rates per 100,000 Arizona residents by age group and sex, separated by manner.

Figure 26. Non-fatal Poisoning-Related Emergency Department Visit Rates per 100,000 Residents by Age Group, Manner, and Sex, Arizona 2011



As with inpatient hospitalizations, the highest rates of non-fatal emergency department visits were among African American and White residents for both unintentional (115.9 per 100,000 residents and 120.9 per 100,000 residents, respectively) and self-inflicted (90.2 per 100,000 residents and 86.2 per 100,000 residents, respectively) poisonings. It is important to note that American Indians are known to be under-represented in emergency department data, and therefore the rates presented here are most likely an underrepresentation of non-fatal poisoning-related visits for that race group. Figure 27 shows the distribution of emergency department visits by race/ethnicity and manner.

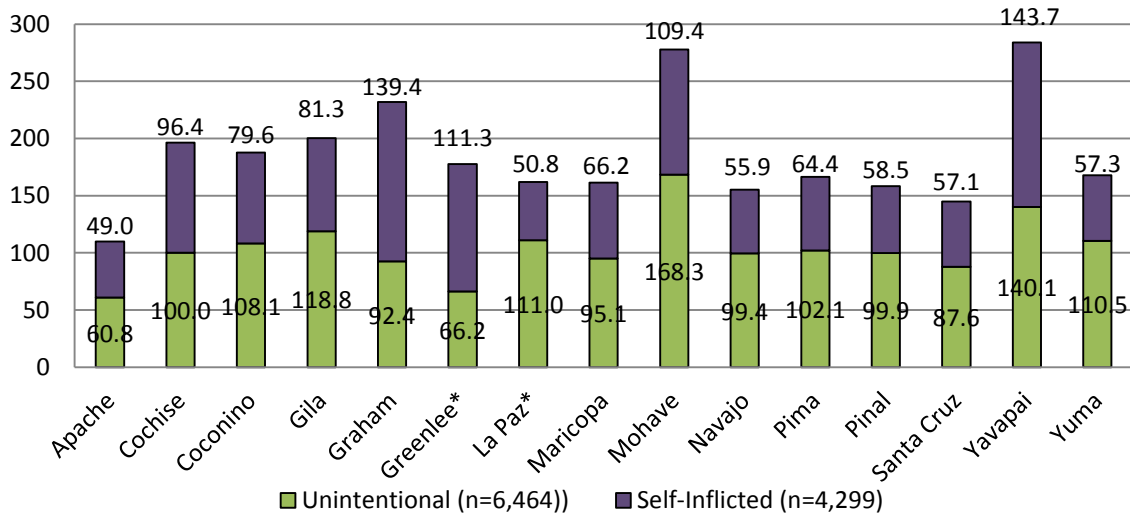
Figure 27. Age-Adjusted Non-Fatal Poisoning-Related Emergency Department Visit Rates per 100,000 Residents by Race/Ethnicity and Manner, Arizona 2011



There were 96 hospitalizations among individuals of other or unknown race/ethnicity.

Mohave and Yavapai Counties had the highest non-fatal emergency department visit rates for both unintentional poisonings (168.3 per 100,000 residents and 140.1 per 100,000 residents, respectively). Yavapai also had the highest non-fatal emergency department visit rate for self-inflicted poisoning (143.7 per 100,000 residents) followed closely by Graham County (139.4 per 100,000 residents). Non-fatal poisoning-related emergency department visits were distributed among residents of Arizona’s counties as shown in Figure 28.

Figure 28. Age-Adjusted Non-Fatal Poisoning-Related Emergency Department Visits by County and Manner, Arizona 2011



*Rates are unstable due to low counts (n<20)

Poisoning and Prescription Drug Overdoses as an Arizona Public Health Concern

Deaths

- Between 2007 and 2011, the age-adjusted poisoning-related mortality rate increased 12 percent for Arizona residents, due largely to increases in unintentional poisoning rates.
- In 2011, poisoning was the leading cause of injury-related deaths (25 percent) accounting for more deaths among Arizonans than car crashes, falls, or firearm injuries.
- Prescription drugs, often combined with alcohol, were responsible for many poison-related deaths. The poisons most commonly specified on death certificates in 2011 were alcohol (16 percent, n=186), Oxycodone or Hydrocodone (15 percent, n=175), and benzodiazepines (9 percent, n=99). Heroin was listed in 10 percent of cases (n=120).
- In 2011, as in previous years, poisoning-related fatality rates were highest among American Indian (24.6 per 100,000 residents) and White, non-Hispanic Arizonans (21.8 per 100,000 residents).

Non-Fatal Hospitalizations and Emergency Department Visits

- Between 2007 and 2011, the age-adjusted rate of non-fatal poisoning-related inpatient hospitalizations among Arizona residents increased 32 percent, from 82.4 cases per 100,000 residents in 2007 to 108.4 cases in 2011.
- Adult women had the highest rates of non-fatal poisoning-related inpatient hospitalizations. Females 45 through 54 years of age had a rate of 167.7 cases per 100,000 residents, and females 35 through 44 years of age had a rate of 163.6 cases per 100,000 residents.
- In 2011, there were 12,516 non-fatal poisoning-related emergency department visits among Arizona residents.
- The highest rates of emergency department visits were among male and female children one through four years of age (412.5 per 100,000 for males, 369.5 per 100,000 for females).
- Hospital charges for non-fatal poisoning-related inpatient hospitalizations totaled more than \$127 million in 2011, and Arizona residents spent a total of 13,822 days hospitalized for non-fatal poisonings.
- Hospital charges for non-fatal poisoning-related emergency department visits totaled over \$56.3 million in 2011.

Arizona's Response

- Arizona has multi-faceted strategies in place to address each of the White House's four approaches to countering prescription drug abuse:
 - Patient and provider education: Arizona has two nationally affiliated poison control centers providing education and drug exposure response throughout the state.
 - Prescription monitoring: Arizona's Controlled Substances Prescription Monitoring Program is managed by the Arizona State Board of Pharmacy. Dispensing pharmacies and practitioners are required under Arizona law to report information on Schedule II, III, and IV prescriptions to the database. (http://www.azpharmacy.gov/CS-Rx_Monitoring/aboutpmp.asp)
 - Drug disposal: Since 2008, sites throughout Arizona have offered drug drop-off services as both individual and ongoing events. These efforts have been expanded in 2012 under the Prescription Drug Reduction Initiative.
 - Law enforcement against improper prescribing: The federal Drug Enforcement Agency actively targets doctors improperly prescribing potentially addictive medications in Arizona. In 2009, the Phoenix DEA's Tactical Diversion Squad charged a Golden Valley doctor with 14 felony charges for operating a 'pill mill'. (<http://www.azcentral.com/news/articles/2009/07/14/20090714rxdrugbust.html>)
- Arizona's Early Childhood home visitors provide education to young families, teaching them to avoid accidental poisoning and providing resources to mitigate the harm.

Poisoning Prevention Tips and Resources

Call **1-800-222-1222** to be connected to a local Poison Control Center.

You can prevent poisonings!

- **Store household cleaners in their original containers, away from children**
 - Pills, vitamins, antifreeze, nail polish remover, or insecticide may look similar to children's candy or beverages. Teach children not to eat or drink something without first asking an adult.
 - Teach children to identify medication, and don't refer to pills as 'candy'
- **Identify poisonous plants around your home and remove from children's reach**
 - Visit the Cornell University Department of Animal Science website on poisonous plants at <http://www.ansci.cornell.edu/plants> or contact your local PCC to learn about poisonous plants
- **Read the label and follow directions for using household products or medications**
- **Check with your doctor or pharmacist to prevent dangerous medication interactions**
- **Properly discard unused, unneeded, or expired medication**
 - Look for drug disposal events in your community. These provide a safe, easy way to responsibly get rid of unneeded medication. Such events may be sponsored by local hospitals, pharmacies, police or fire departments.
 - Only flush drugs down the toilet if the label specifically says to do so
 - Ask your pharmacist if you're unsure about proper disposal
 - To dispose of all other medications:
 - Remove the medication from the original packaging
 - Crush the pills and mix them with kitty litter, coffee grounds, or sand
 - Seal the mixture in a plastic bag and dispose of it with your household trash
- **Properly discard unused or unneeded household poisons and their containers**
 - Check with your city or county for hazardous waste collection events and locations.
 - Household poisons can include paints and solvents, auto fluids, household cleaners, pesticide, and pool chemicals
- **Participate in National Poison Prevention Week, held annually during the 3rd week of March**
 - The federal Health Resources and Services Administration (HRSA) provides an Event Planner Kit to help your agency or business get involved. Visit www.poisonprevention.org for more information.

Visit Arizona's Poison Control Centers on the internet at:

Arizona Poison and Drug Information Center, Tucson, Arizona
<http://www.pharmacy.arizona.edu/outreach/poison/index.php>

Banner Good Samaritan Poison and Drug Information Center, Phoenix, Arizona
http://www.bannerhealth.com/Locations/Arizona/Banner+Poison+Control+Center/_Banner+Poison+Control+Center.htm

Methodology

Mortality data for 2007 through 2011 were compiled from the death certificates registered with the Arizona Department of Health Services Office of Vital Registration. Any death record for an Arizona resident assigned an International Classification of Diseases, 10th Revision (ICD-10) code for poisoning as the underlying cause of death was included in the count. Poisonings due to envenomation by animals, plants, or insects (X20 – X29) were excluded from this report. Table 7 shows the ICD-10 codes included in this report.

ICD-10 Code	ICD-10 Code Description
X40	Unintentional poisoning by non-opioid analgesics, including aspirin and ibuprofen
X41	Unintentional poisoning by sedative or hypnotic drugs, including antidepressants and barbiturates
X42	Unintentional poisoning by narcotic or hallucinogenic drugs, including marijuana, heroin, and methadone
X43	Unintentional poisoning by drugs acting on the autonomic nervous system
X44	Unintentional poisoning by other and unspecified drugs
X45	Unintentional poisoning by alcohol meant for ingestion
X46	Unintentional poisoning by organic solvents
X47	Unintentional poisoning by other gases, including carbon monoxide and motor vehicle exhaust
X48	Unintentional poisoning by pesticides or herbicides
X49	Unintentional poisoning by other and unspecified chemicals
X60	Suicide by poisoning using non-opioid analgesics, including aspirin and ibuprofen
X61	Suicide by poisoning using sedative or hypnotic drugs, including antidepressants and barbiturates
X62	Suicide by poisoning using narcotic or hallucinogenic drugs, including marijuana, heroin, and methadone
X63	Suicide by poisoning using drugs acting on the autonomic nervous system
X64	Suicide by poisoning using other and unspecified drugs
X65	Suicide by poisoning using alcohol meant for ingestion
X66	Suicide by poisoning using organic solvents
X67	Suicide by poisoning using other gases, including carbon monoxide and motor vehicle exhaust
X68	Suicide by poisoning using pesticides or herbicides
X69	Suicide by poisoning using other and unspecified chemicals
X85	Homicide by poisoning using drugs or a biological substance
X86	Homicide by poisoning using corrosive gas
X87	Homicide by poisoning using pesticide
X88	Homicide by poisoning using gas or vapors
X89	Homicide by poisoning using other specified chemicals
X90	Homicide by poisoning using unspecified chemicals
Y10	Poisoning by non-opioid analgesics, including aspirin and ibuprofen, undetermined intent
Y11	Poisoning by sedative or hypnotic drugs, including antidepressants and barbiturates, undetermined intent
Y12	Poisoning by narcotic or hallucinogenic drugs, including marijuana, heroin, and methadone, undetermined intent
Y13	Poisoning by drugs acting on the autonomic nervous system, undetermined intent
Y14	Poisoning by other and unspecified drugs, undetermined intent
Y15	Poisoning by alcohol meant for ingestion, undetermined intent

Y16	Poisoning by organic solvents, undetermined intent
Y17	Poisoning by other gases, including carbon monoxide or motor vehicle exhaust, undetermined intent
Y18	Poisoning by pesticides or herbicides, undetermined intent
Y19	Poisoning by other and unspecified chemicals, undetermined intent

Inpatient hospitalization discharge data and emergency department discharge data from 2007 through 2011 were compiled from the Arizona Hospital Discharge Database at the Arizona Department of Health Services. The discharge database contains information from private, acute-care facilities in the state of Arizona, and do not include visits to federal facilities, such as Veterans' Affairs Hospitals or Indian Health Services facilities. The discharge databases do not contain data from urgent care facilities, private physician practices, or medical clinics. Hospital discharge data include hospital transfers and readmissions. Therefore, a single injured individual may be counted more than once. These data should be interpreted as episodes of medical treatment, not individual injuries.

Additionally, the data do not allow for analysis of the combined effect of two or more poisonous agents.

Records for Arizona residents assigned an International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) External Cause of Injury Code (E-Code) for poisoning as the primary cause of injury were included in this report. The following E-Code ranges were included: E850 – E858, E860 – E869, E950 – E952, E962, E972, E980 – E982. Table 15 lists the general categories of poisonings included in these ICD-9-CM E-Codes. Poisonings due to envenomation by animals, plants, or insects (E905.0 – E905.9) were excluded from this report, as were cases in which medications caused an adverse reaction after therapeutic use (E930 – E949). Medications were counted as poisoning events only if they were administered incorrectly or with the intent to harm. This could include the administration of the wrong drug, or an incorrect dose of a prescribed medication.

Table 15. International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) Codes Used in This Report	
ICD-9-CM Codes	ICD-9-CM Category Description
E850 – E858	Unintentional poisoning by drugs, medicinal substances, and biologicals
E860 – E869	Unintentional poisoning by other solid and liquid substances, gases, and vapors
E950 – E952	Suicide and self-inflicted poisoning by solid or liquid substances, gases in domestic use, and other gases or vapors
E962	Assault by poisoning
E972	Injury due to legal intervention by gas, including poisoning by gas
E980 – E982	Poisoning by solid or liquid substances, gases in domestic use, and other gases, undetermined whether unintentionally or purposely inflicted

Rates for 2007 through 2009 and 2011 were calculated using Arizona population data compiled by the Arizona Department of Health Services' Bureau of Public Health Statistics, available on the internet at: www.azdhs.gov/plan/menu/info/pd.htm. Rates for 2010 were calculated using the 2010 United States Decennial Census figures for Arizona (Summary File 1), available on the internet from the U.S. Census Bureau's American FactFinder: <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>.

To help compare groups over time, rates have been age-adjusted. Age-adjusting is a statistical procedure used to remove the effect of age differences between populations. All age-adjusted rates in this report were computed using the 'direct' method in which the age-specific rates for a given year are weighted by the age distribution of the 2000 standard population. For information on how to calculate an age-adjusted rate, or to see the 2000 standard age distribution, visit the National Cancer Institute Surveillance Epidemiology and End Results (SEER) program at <http://seer.cancer.gov/seerstat/tutorials/aarates/definition.html>.