Poisonings among Arizona Residents, 2012

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Prepared by: Jennifer D. Dudek, MPH
150 North 18th Avenue, Suite 320
Phoenix, AZ 85007
Office of Injury Prevention
Bureau of Women's and Children's Health
Arizona Department of Health Services
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Executive Summary

Poisoning was the leading cause of injury-related mortality among Arizona residents in 2012, 1,097 (24 percent) deaths were attributable to poisoning. Males aged 45 through 54 years had the highest rate of poisoning-related deaths with 43.9 deaths per 100,000 residents. Poisoning mortality rates were highest among American Indians (28.3 deaths per 100,000 residents) and non-Hispanic Whites (20 deaths per 100,000 residents). Seventy-six percent of the poisoning-related deaths in 2012 were due to unintentional injuries (n=832); 16 percent were due to suicide (n=154); and eight percent were of an undetermined manner of death (n=110). The poisons most commonly specified on death certificates in 2012 were alcohol (18 percent, n=198), Oxycodone or Hydrocodone (16 percent, n=179), and Methamphetamine (10 percent, n=108). Among counties with at least 20 poisoning-related deaths in 2012, Navajo County had the highest fatality rate (37.6 deaths per 100,000 residents).

In 2012, there were 7,154 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 179.6 cases per 100,000 residents, and females 35 through 44 years of age had a rate of 166.3 cases per 100,000 residents. White, non-Hispanic residents had the highest age-adjusted poisoning-related rate of non-fatal inpatient hospitalizations in 2012 (138.0 per 100,000) followed closely by African-American Arizona residents (127.6 cases per 100,000 residents). Unintentional poisoning accounted for 47 percent of non-fatal inpatient hospitalizations (n=3,382), and intentional poisonings comprised an additional 45 percent (n=3,191). Hospital charges for non-fatal poisoning-related inpatient hospitalizations totaled more than $120 million in 2012, and Arizona residents spent a total of 12,817 days hospitalized for these injuries. Gila County had the highest age-adjusted rate of inpatient hospitalizations due to non-fatal poisonings (146.3 hospitalizations per 100,000 residents).

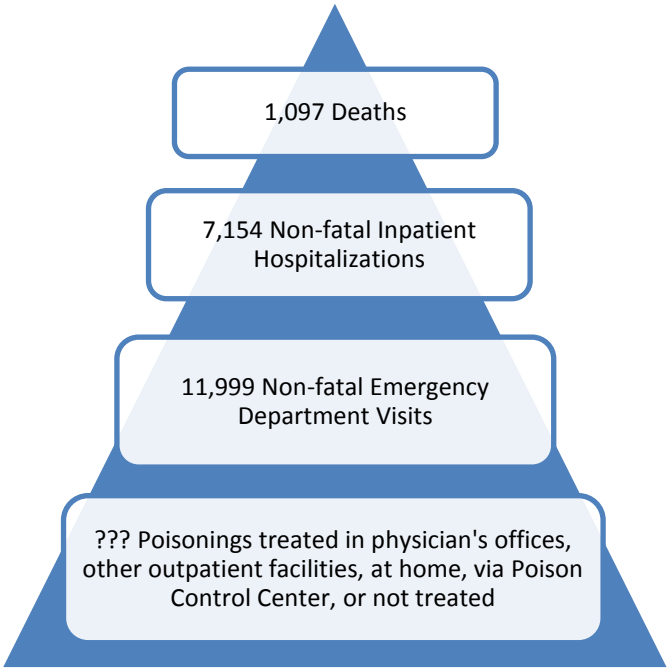
In 2012, there were 11,999 non-fatal poisoning-related emergency department visits among Arizona residents. The highest age-specific rates of non-fatal poisoning-related emergency department visits for both males and females were among children younger than five years of age (429.0 visits per 100,000 residents and 390.8 per 100,000 residents, respectively). Fifty-two percent of the non-fatal poisoning-related emergency department visits were the result of unintentional poisonings (n=6,190), and 35 percent of the visits resulted from intentional injuries (n=4,178).

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 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 2012



This report presents a comprehensive picture of poisoning-related injuries among Arizona residents in 2012, as well as poisoning trends during the five years since 2008. 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, they are also tasked with educating the public about poisoning prevention.

As of March 2014, 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 2012, the APDIC documented 23,407 calls for human exposures to toxins and poisons, out of 49,394 total calls (47 percent). Twenty-four of these cases resulted in death and 33 percent (n=7,681) of the calls were managed in a healthcare facility.

In 2012, the BGSPDIC documented 46,817 calls for human exposures to toxins and poisons, out of more than 90,000 total calls (52 percent). 73 percent of calls were managed at home and eight-six percent of all human exposure calls were accidental or unintentional.

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 more than 34,000 callers may have sought medical treatment at an emergency department in 2012 if they had not been able to consult with the poison control center and care for themselves at home saving the community more than $30 million in emergency treatment costs.[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]

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[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 March 11th, 2014 at www.bannerhealth.com/Locations/Arizona/Banner+Good+Samaritan+Poison+and+Drug+Information+Center/About+Us/By+the+Numbers.htm

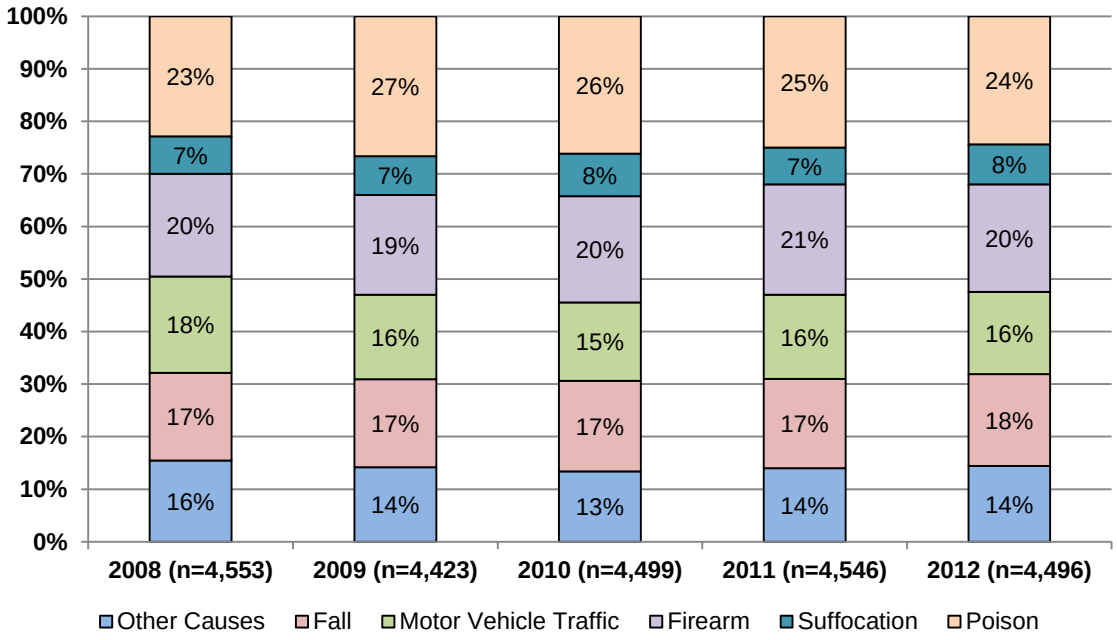
[4] Kearney TE, Olson KR, Bero LA, Heard SE, Blanc PD. Health Care Cost Effects of Public Use of a Regional Poison Control Center. *West J Med* 1995; 162:499-504.

Five-Year Trends in Poisonings among Arizona Residents, 2008-2012

Mortality

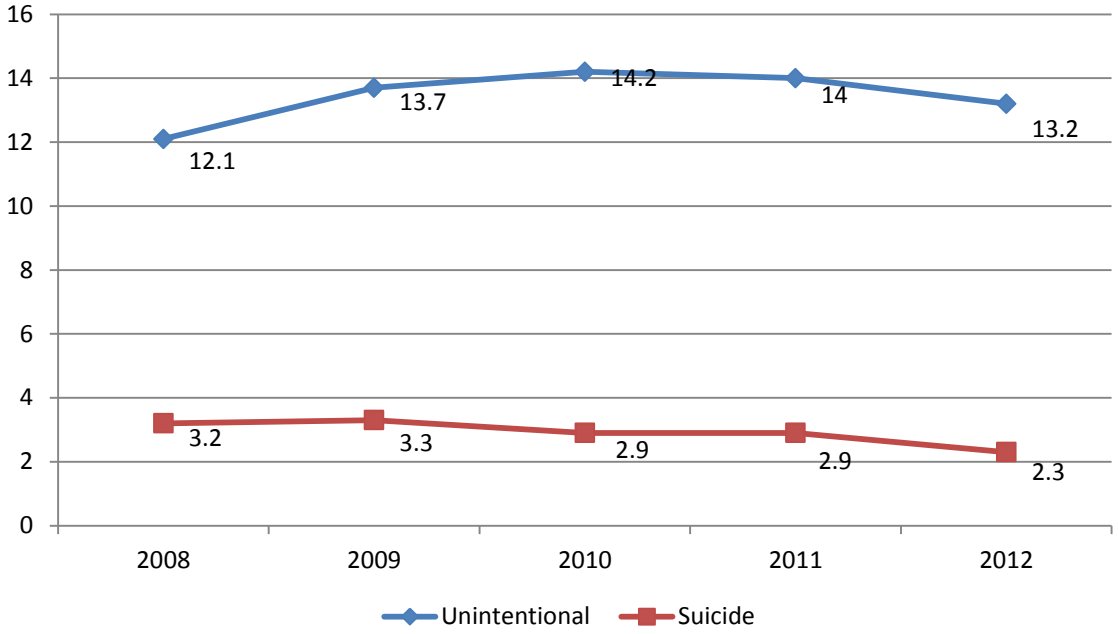
While injuries account for approximately 10 percent of deaths among Arizonans each year, the types of injury have changed over time. Since 2008, the proportion of poisoning-related deaths has increased from 23 percent of all injury-related deaths (n=1,047) to 24 percent of injury-related deaths in 2012 (n=1,097). Over this five-year period, the number of injury-related deaths has decreased slightly, and the increase in poisoning-related deaths was offset by 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 2008 through 2012.

Figure 1. Proportion of Injury-Related Fatalities by Mechanism of Injury Arizona, 2008-2012



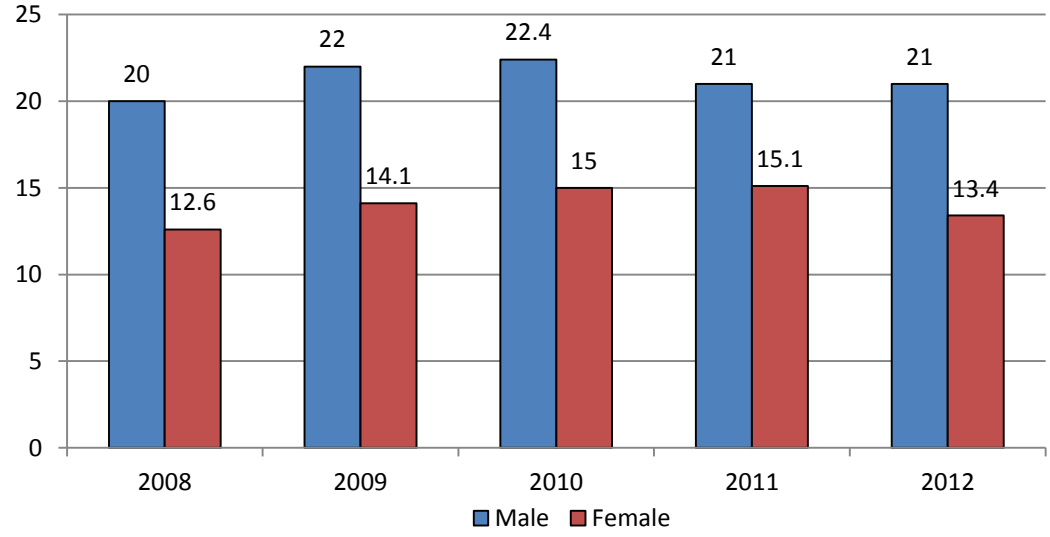
Between 2008 and 2012, the age-adjusted poisoning-related mortality rate increased five percent for Arizona residents. This overall increase is attributable to the rate of unintentional poisoning deaths, which has increased by nine percent since 2008. Suicide-related poisonings have been steadily decreasing since 2009 and have decreased 28 percent overall since 2008. The most significant decrease in suicide-related poisonings occurred from 2011 to 2012 with a 21 percent decline in mortality rate. Figure 2 shows the age-adjusted poisoning-related mortality rates by manner of death for Arizona residents from 2008 to 2012.

Figure 2. Age-Adjusted Poisoning-Related Mortality Rates per 100,000 Residents by Intent, Arizona 2008-2012



Between 2008 and 2012, 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 2008 to 2012.

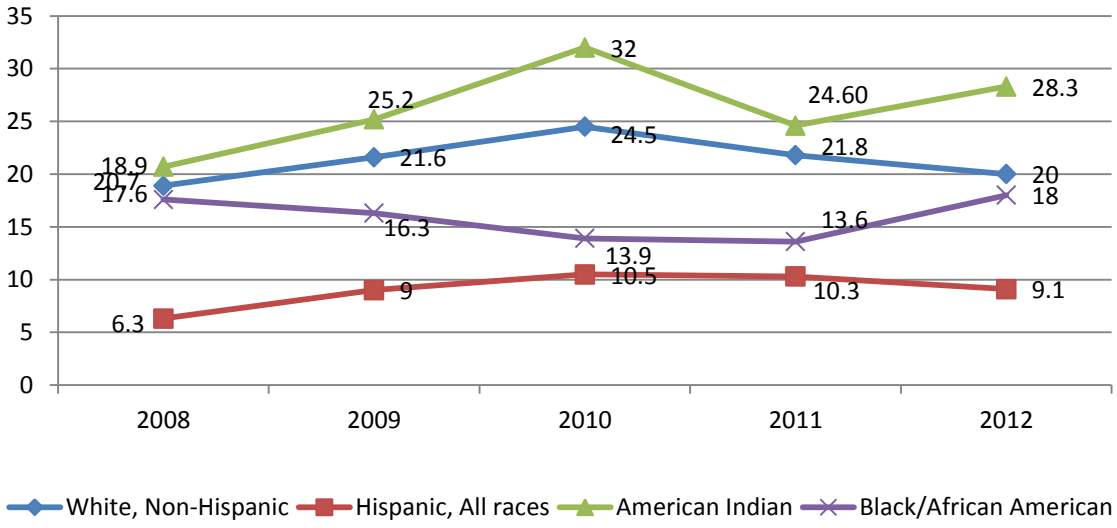
Figure 3. Age-Adjusted Poisoning-Related Mortality Rates per 100,000 Residents by Sex, Arizona 2008-2012



Poisoning-related mortality rates increased among Hispanic Arizonans by 44 percent over the 5-year period but decreased 12 percent between 2011 and 2012. American Indians had the highest mortality rate with a 37 percent increase between 2008 and 2012. The 2012 rate (28.3 per 100,000) represents a 15 percent increase from the 2011 rate, but an 11 percent decrease from 2010 when the mortality rate for this group was at its highest. The poisoning-related mortality rates increased among African Americans and Non-Hispanic Whites by

two and six percent respectively. Figure 4 shows the age-adjusted poisoning-related mortality rates by race/ethnicity for Arizona residents from 2008 to 2012. Due to small numbers, age-adjusted poisoning-related fatality rates have not been presented for Asian residents.

Figure 4. Age-Adjusted Poison-Related Mortality Rates per 100,000 Residents by Race/Ethnicity, Arizona 2008-2012*



Source: WISQARS for 2008-2010 rates, Arizona Vital Statistics for 2011-2012
*Does not include 31 poisoning-related deaths among persons listed as other or unknown race/ethnicities.

While the trend is not supported in all counties, the age-adjusted rate of poisoning-related fatalities in Arizona increased 5 percent between 2008 and 2012. Table 1 shows the age-adjusted fatality rate per 100,000 residents for poisoning-related deaths by county of residence from 2008 to 2012.

Table 1. Age-Adjusted Fatality Rate per 100,000 Residents for Poisoning-Related Deaths by County of Residence, Arizona 2008-2012

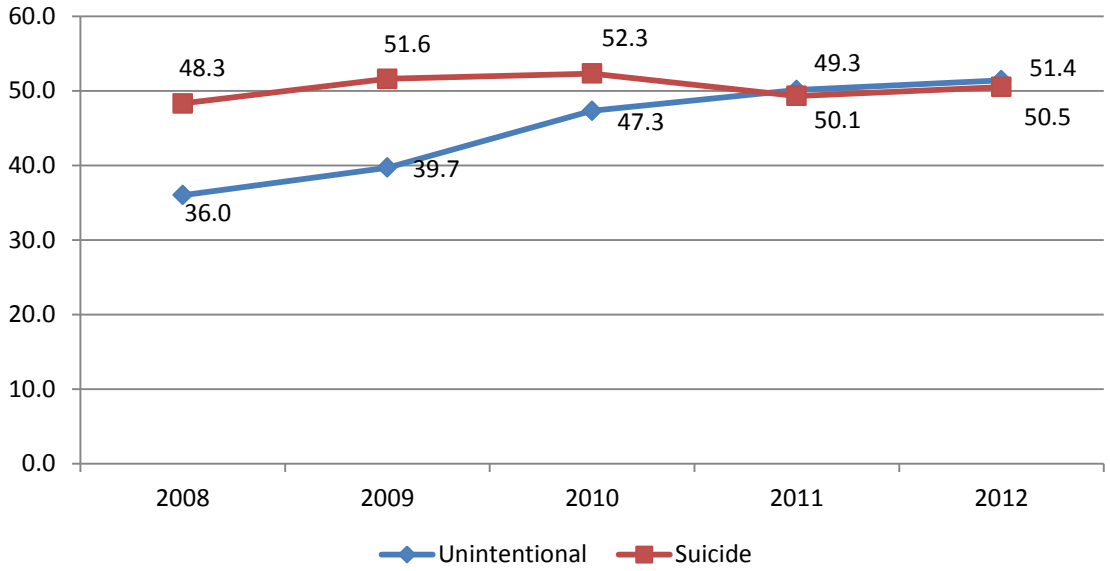
	2008	2009	2010	2011	2012
Apache*	23.2	23.1	28.8	23.3	22.1
Cochise*	13.0	17.3	16.6	9.4	19.4
Coconino*	18.6	18.4	18.6	21.0	17.7
Gila*	18.0	27.1	21.2	25.4	33.6
Graham*	14.7	16.5	17.5	19.9	18.2
Greenlee*	10.1	50.1	11.4	16.2	**
La Paz*	20.0	25.2	58.4	14.0	**
Maricopa	16.0	16.7	16.6	16.7	14.9
Mohave	21.3	31.1	32.0	28.3	27.6
Navajo*	16.5	26.0	25.8	35.1	37.6
Pima	17.7	20.8	22.6	20.7	20.8
Pinal	13.6	13.4	16.3	13.0	12.3
Santa Cruz*	6.7	18.5	7.7	5.5	5.7
Yavapai	20.5	21.1	27.8	31.0	35.2
Yuma*	12.3	13.0	14.0	12.2	15.5
Statewide Total	**16.4**	**18.1**	**18.7**	**18.1**	**17.2**

*Rates are unstable for counties indicated, as they had fewer than 20 deaths in at least one year.
** No poisoning-related deaths were recorded for these counties.

Non-Fatal Inpatient Hospitalizations

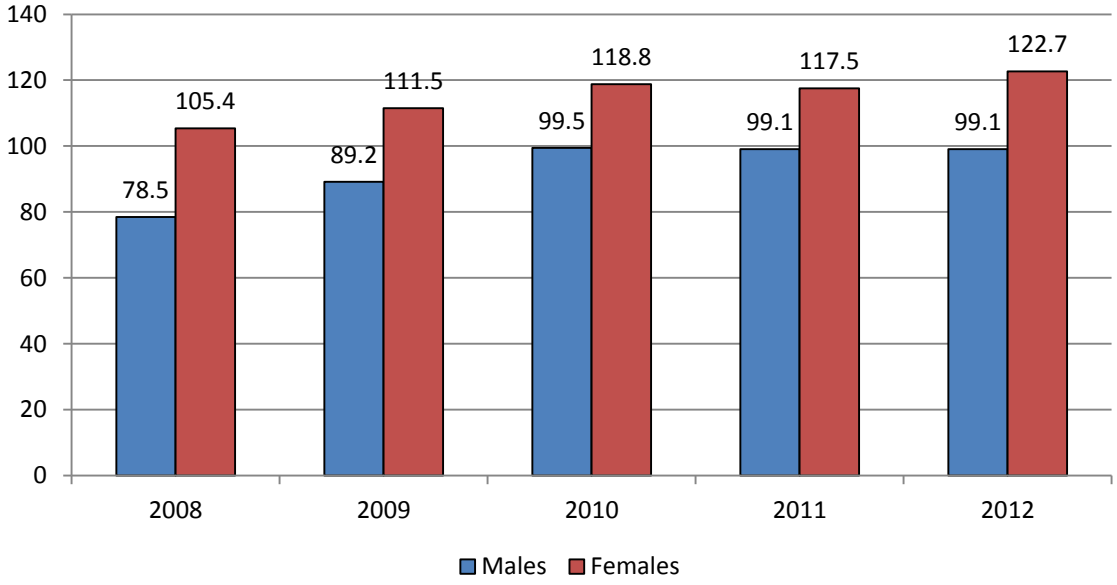
Between 2008 and 2012, the age-adjusted rate of non-fatal poisoning-related inpatient hospitalizations among Arizona residents increased 21 percent, from 91.9 cases per 100,000 residents in 2008 to 111.0 cases in 2012. While the increase was still apparent when hospitalizations were divided by injury intent, cases resulting from unintentional poisonings increased more than cases of intentional poisoning (a 43 percent increase and a 5 percent increase, respectively). It's important to note, however, that there were 578 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 2008 to 2012.

Figure 5. Age-Adjusted Poisoning-Related Non-fatal Inpatient Hospitalization Rates per 100,000 residents by Manner, Arizona 2012



The rates for non-fatal poisoning-related inpatient hospitalizations were higher for females then for males. Rates increased among both males and females during the five years from 2008 through 2012, with a 26 percent increase in the rate among males and a 16 percent increase in the rate among females. Figure 6 shows the age-adjusted rates by sex for non-fatal poisoning-related inpatient hospitalizations from 2008 through 2012.

Figure 6. Age-Adjusted Non-fatal Poisoning-Related Inpatient Hospitalization Rates per 100,000 Residents by Sex, Arizona 2008-2012



The age-adjusted rate of non-fatal poisoning-related inpatient hospitalizations in Arizona increased between 2008 and 2012 among almost all counties with at least 20 hospitalizations in a given year. Yuma and Graham Counties are the exception; the 2012 non-fatal hospitalization rates of 43.0 and 63.6 per 100,000 residents, respectively, are a 36 and 54 percent decrease from 2008. 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 2008 to 2012. 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 2008-2012

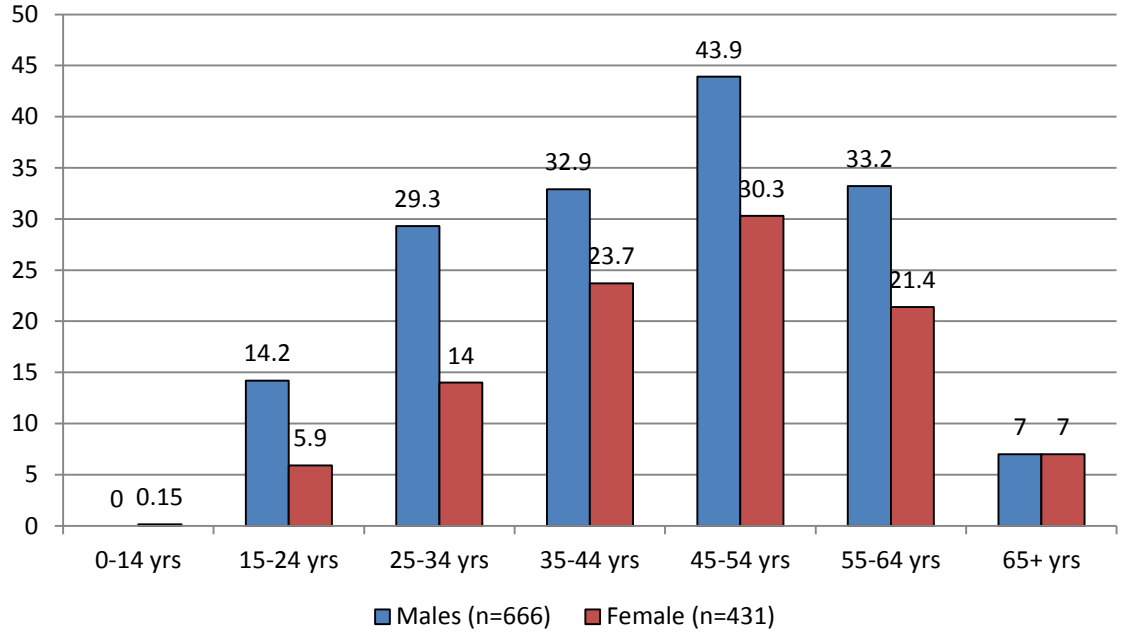
	2008	**2009**	**2010**	**2011**	**2012**
Apache*	45.4	55.7	58.4	43.0	61.6
Cochise	53.1	68.3	66.7	73.7	63.5
Coconino	63.1	59.2	73.8	85.2	81.8
Gila	97.8	101.3	129.6	156.0	149.2
Graham	139.2	187.6	157.4	88.4	63.6
Greenlee*	89.9	76.3	37.0	127.2	125.6
La Paz*	39.9	113.5	52.8	68.1	40.4
Maricopa	94.6	102.5	114.5	117.3	115.5
Mohave	104.3	124.9	112.8	123.2	142.5
Navajo	76.6	83.3	95.2	103.9	110.6
Pima	103.6	107.0	116.8	109.6	123.6
Pinal	90.9	117.0	109.3	92.3	113.7
Santa Cruz*	44.2	47.6	48.9	59.3	40.5
Yavapai	74.2	78.3	105.3	85.4	97.7
Yuma	67.4	68.8	67.9	38.9	43.0
Statewide Total	**91.9**	**100.3**	**109.2**	**108.4**	**111.0**

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

Poisoning-Related Mortality, 2012

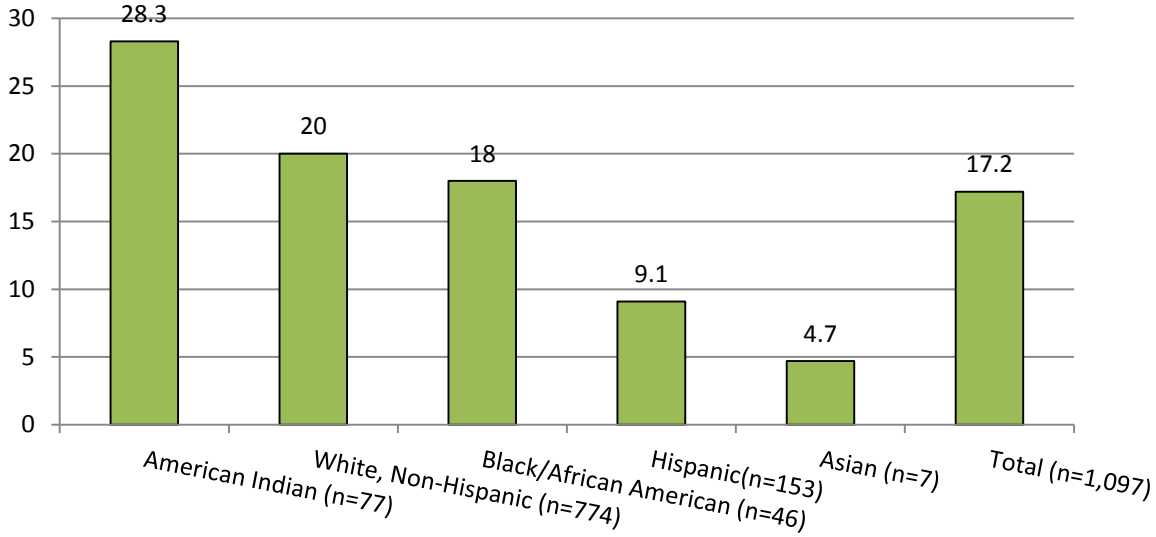
There were 1,097 deaths among Arizona residents attributed to poisoning in 2012. Sixty-one percent of deaths were among males (n=666), and 39 percent were among females (n=431). In 2012, the age-adjusted poisoning mortality rate among Arizona females was 13.4 deaths per 100,000 residents; the rate among males was 57 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. Young adults in the 15 to 24 age group had the highest ratio of deaths among males versus females. Deaths among males 25 through 34 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 2012



American Indian residents had the highest age-adjusted poisoning-related mortality rate in 2012 (28.3 deaths per 100,000 residents), followed closely by White, non-Hispanic residents (20.0 deaths per 100,000 residents). Hispanic Arizonans had the lowest stable poisoning-related mortality rate in 2012 with 9.1 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 2012.

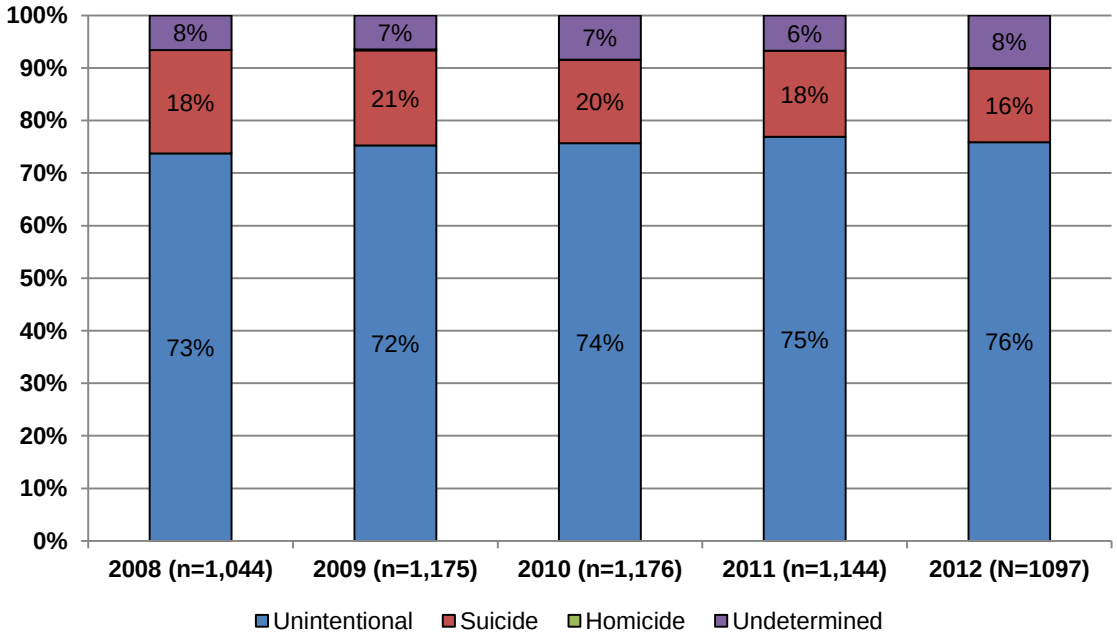
Figure 9. Age-Adjusted Poisoning-Related Mortality Rate per 100,000 Residents by Race/Ethnicity, Arizona 2012



There were 31 deaths among individuals of other or unknown race/ethnicity.

As in previous years, the majority of poisoning-related deaths were determined to be unintentional. In 2012, 76 percent of poisoning-related deaths among Arizona residents were unintentional (n=883). With 154 suicides, 2012 had the lowest percentage of poisoning-related suicide deaths in any year from 2008 through 2012. Figure 10 shows the proportion of poisoning-related deaths by manner in each year from 2008 through 2012.

Figure 10. Proportion of Poisoning-Related Fatalities by Intent, Arizona, 2008-2012



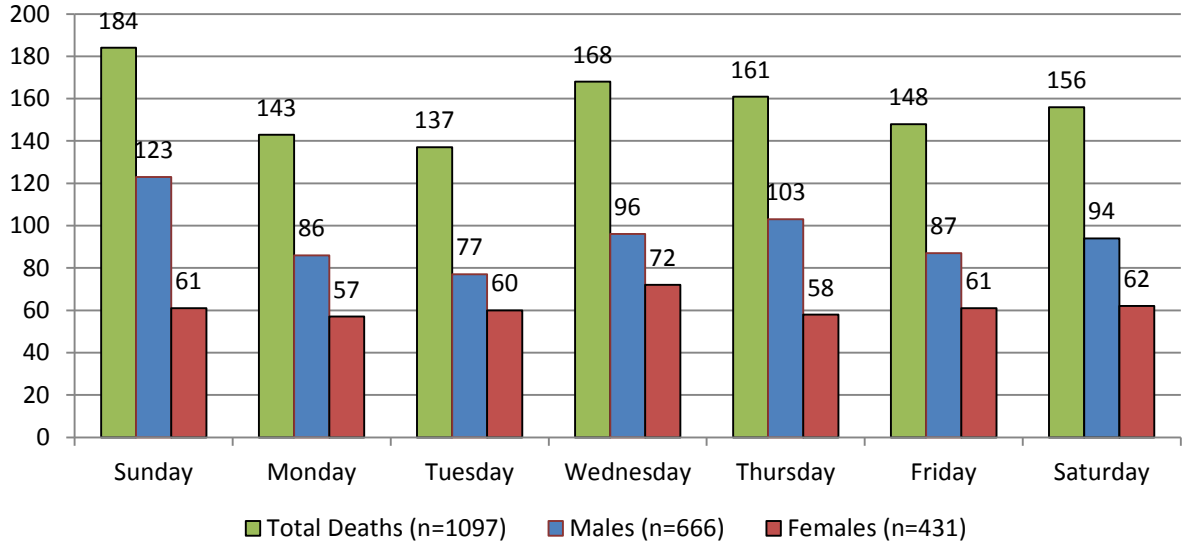
Every poisoning-related fatality has its own circumstances, including the type of poison used. Multiple drugs may be listed as contributing to a single death. Table 3 lists the poisons most commonly specified on the 2012 death certificates. Because some death certificates may simply state that the cause 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 2008-2012										
Poisons*	**2008 (n=1,044)**		**2009 (n=1,175)**		**2010 (n=1,176)**		**2011 (n=1,144)**		**2012 (n=1,097)**	
	#	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Alcohol	186	18%	155	15%	186	18%	186	16%	198	18%
Benzodiazepines	97	9%	54	5%	97	9%	99	9%	103	9%
Carbon Monoxide	41	4%	36	4%	41	4%	16	1%	32	3%
Carisoprodol	15	1%	10	1%	15	1%	12	1%	10	1%
Cocaine	87	8%	125	12%	87	8%	59	5%	58	5%
Diphenhydramine	30	3%	22	2%	30	3%	18	2%	23	2%
Fentanyl	37	4%	22	2%	37	4%	21	2%	15	1%
Helium	6	1%	5	<1%	6	1%	10	1%	7	1%
Heroin	67	6%	56	6%	67	6%	120	10%	91	8%
Methadone	105	10%	79	8%	105	10%	53	5%	40	4%
Methamphetamine	91	9%	104	10%	91	9%	116	10%	108	10%
Morphine	115	11%	81	8%	115	11%	101	9%	98	9%
Oxycodone/Hydrocodone	162	16%	119	12%	162	16%	175	15%	179	16%
Serotonin-Norepinephrine Reuptake Inhibitors (SNRIs)	11	1%	10	1%	11	1%	14	1%	10	1%
Selective Serotonin Reuptake Inhibitors (SSRIs)	55	5%	44	4%	55	5%	49	4%	50	5%
Tramadol	10	1%	13	1%	10	1%	15	1%	19	2%
*More than one poison may have been identified for each death										

In 2012, Saturdays had the highest number of deaths accounting for 17 percent of the total deaths, (n=184).Wednesdays and Thursdays both had 15 percent each and Tuesdays had the lowest number of deaths, accounting for 12.5 percent (n=137). However, as Figure 11 indicates, these differences are not statistically significant.

Figure 11. Poisoning Mortality by Day of Week and Sex, Arizona 2012

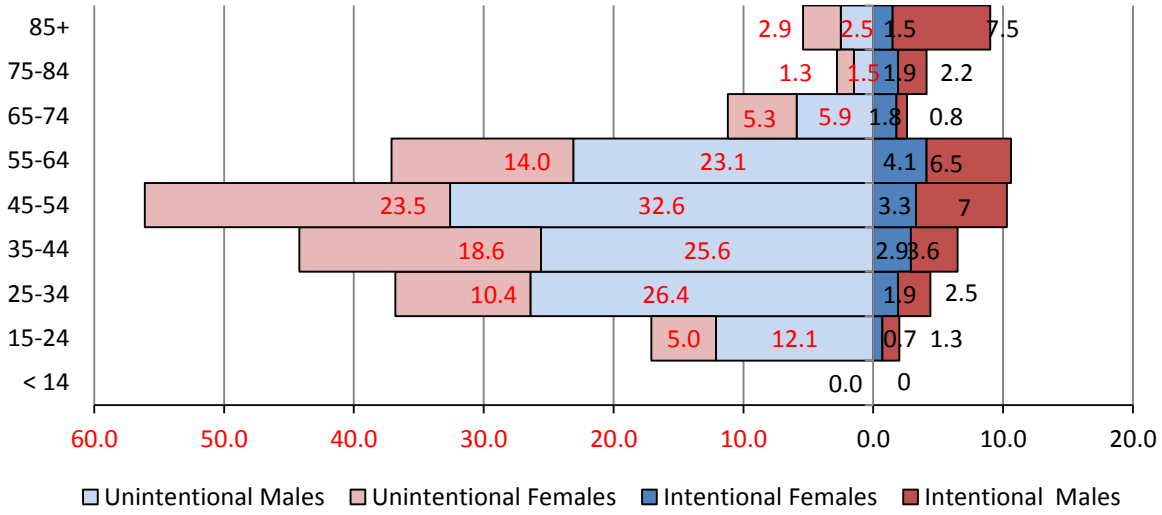


Poisoning Fatalities by Manner

There were 832 unintentional poisoning deaths in 2012 (76 percent), 61 percent were among males (n=666), and 39 percent were among females (n=431). In 2012 there were no deaths among children ages newborn through 14 years. There were 154 poisoning-related suicides in 2012 (14 percent), 60 percent of which were among males (n=92). There were no poisoning-related suicides among either sex below the age of 15 years.

In 2012, Males aged 45 through 54 years had the highest mortality rate for unintentional poisoning-related deaths (32.6 deaths per 100,000 residents), although young adult males ages 25 through 34 also had high mortality rates (26.4 deaths per 100,000 residents). Males had higher poisoning-related suicide rates in all age groups except in the 65 through 74 year old age grouping. The highest suicide rates were among males 55 through 64 and over 85 years of age (6.5 and 7.5 suicides per 100,000 residents, respectively). Figure 12 shows the death rates for poisonings by age group, manner, and sex per 100,000 Arizona residents in 2012.

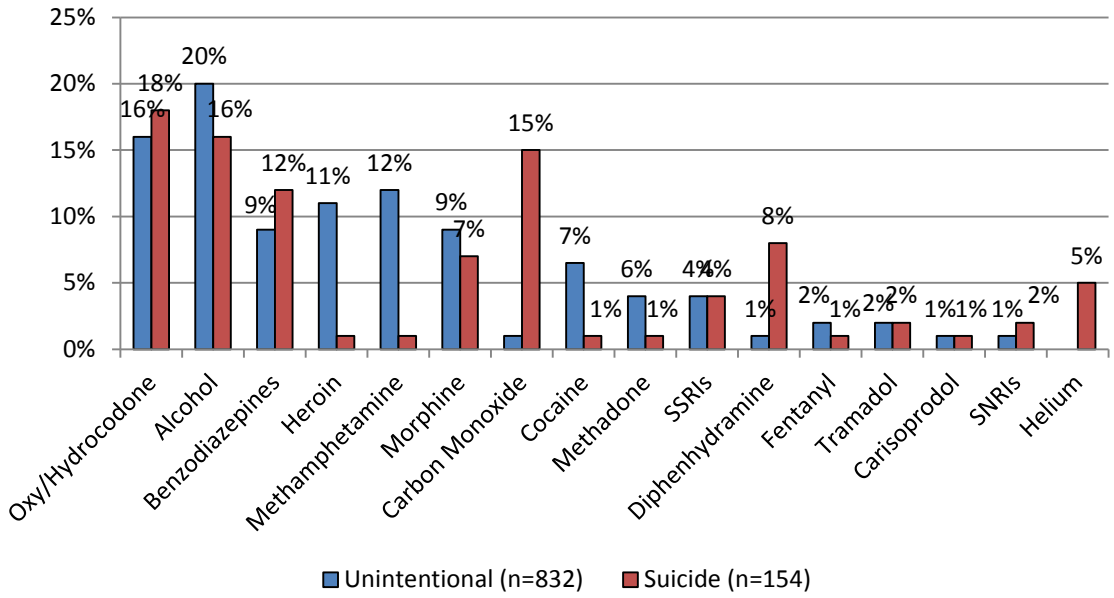
Figure 12. Age-specific Poisoning-Related Mortality Rates per 100,000 Residents by Age, Sex, and Manner, Arizona 2012 (n=986*)



*Does not include 110 deaths due to undetermined manner or the 1 death attributed to homicide

Figure 13 shows the poisons most commonly specified on the 2012 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 13. Poisons Commonly Listed on Death Certificates (%), by Drug Type, Arizona 2012*



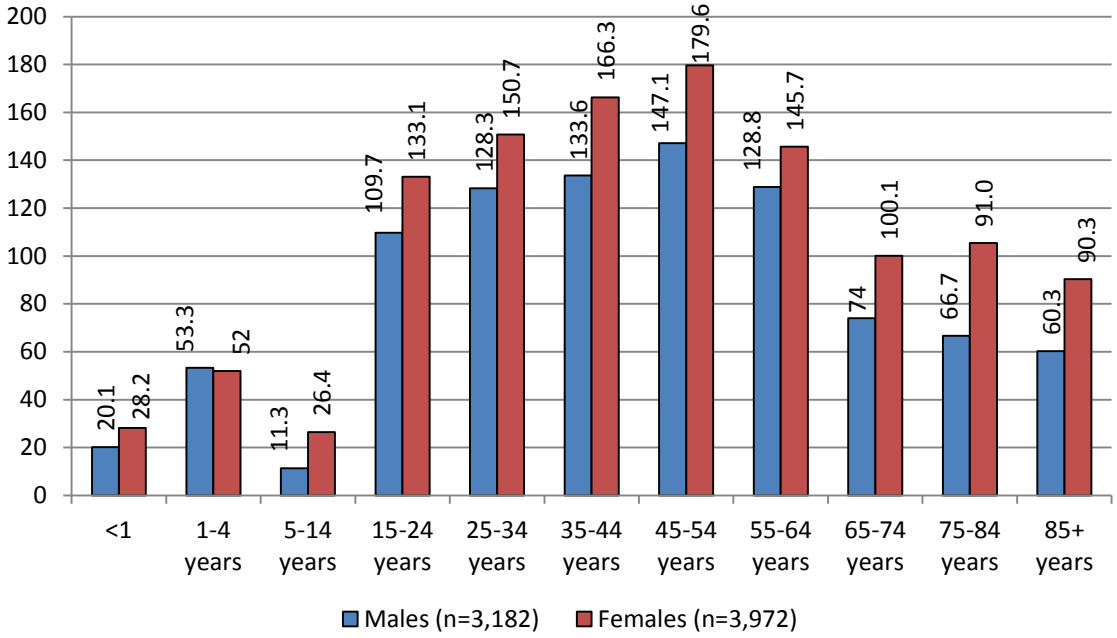
*More than one poison may have been listed for each death certificate.

Non-Fatal Poisoning-Related Inpatient Hospitalizations, 2012

There were 7,154 non-fatal inpatient hospitalizations among Arizona residents attributed to poisoning in 2012, and an age-adjusted rate of 111.0 per 100,000 residents. Forty-five percent of the events were among males (n=3,182), and 56 percent were among females (n=3,972). 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=3,382), 45 percent resulted from intentional poisonings (n=3,191), poisonings of undetermined intent accounted for eight percent of hospitalizations (n=578), and there was one visit due to poisoning-related assaults or other intents (legal intervention).

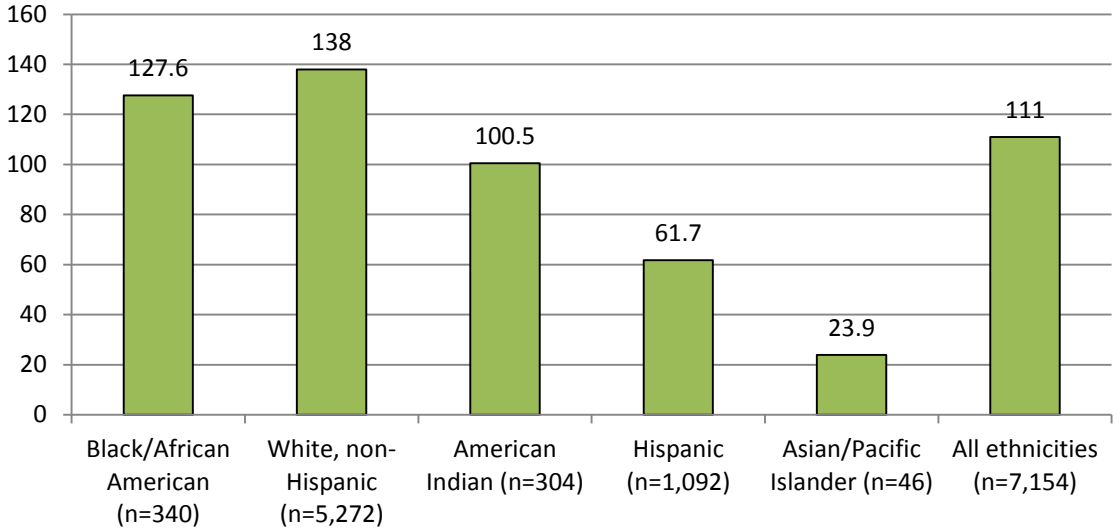
Except for children ages one through four years of age, females had higher rates of non-fatal inpatient hospitalizations than males across the lifespan. The 45 through 54 year age group had the highest rate among both males and females. Figure 14 shows the non-fatal poisoning-related inpatient hospitalization rates per 100,000 Arizona residents by age group and sex.

Figure 14. Non-fatal Poisoning-Related Inpatient Hospitalization Rates per 100,000 residents, by Sex, Arizona 2012



White, non-Hispanic residents had the highest age-adjusted poisoning-related rate of non-fatal inpatient hospitalizations in 2012 (138.0 per 100,000) followed closely by African-American Arizona residents (127.6 cases per 100,000 residents). Asian residents had the lowest poisoning-related rate of non-fatal inpatient hospitalizations in 2012 with 23.9 cases per 100,000 residents. Figure 15 shows the age-adjusted non-fatal poisoning-related inpatient hospitalization rates by race/ethnicity for Arizona residents in 2012.

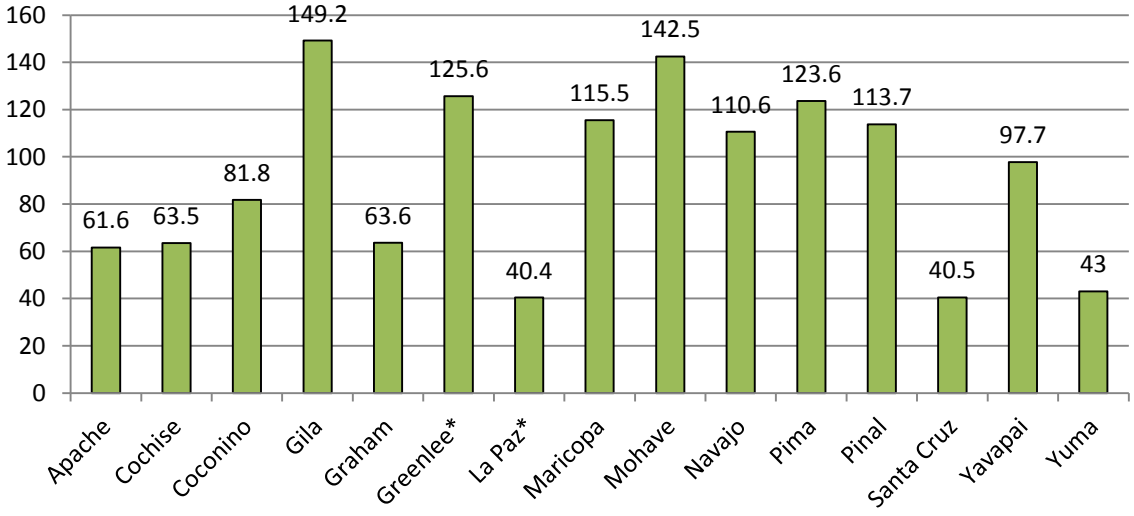
Figure 15. Age-Adjusted Non-Fatal Poisoning-Related Inpatient Hospitalization Rate per 100,000 by Race/Ethnicity, Arizona 2012



There were 100 hospitalizations among individuals of other or unknown race/ethnicity.

Gila County had the highest rate of inpatient hospitalizations for non-fatal poisonings in 2012, with 149.2 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 fatal and non-fatal hospitalizations. The rate of non-fatal poisoning-related inpatient hospitalizations were distributed among residents of Arizona's counties as shown in Figure 16.

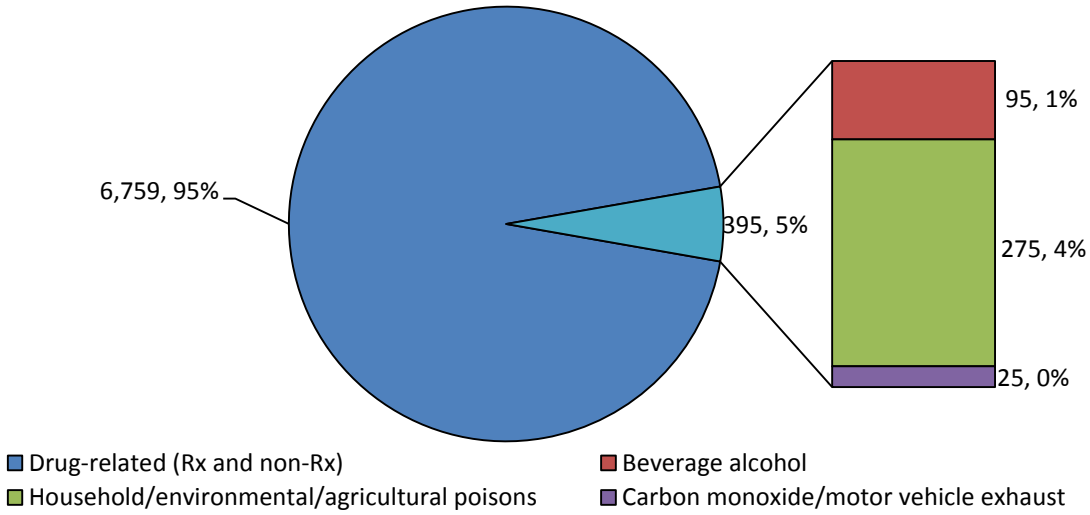
Figure 16. Age-adjusted Non-Fatal Poisoning-Related Inpatient Hospitalization Rates per 100,000 residents by County, Arizona 2012



*Rates are unstable due to low counts (n<20); Does not include 3 cases 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 2012 data.

Figure 17. Non-fatal Poisoning-Related Inpatient Hospitalizations by Poison Type, Arizona 2012 (n=7,154)

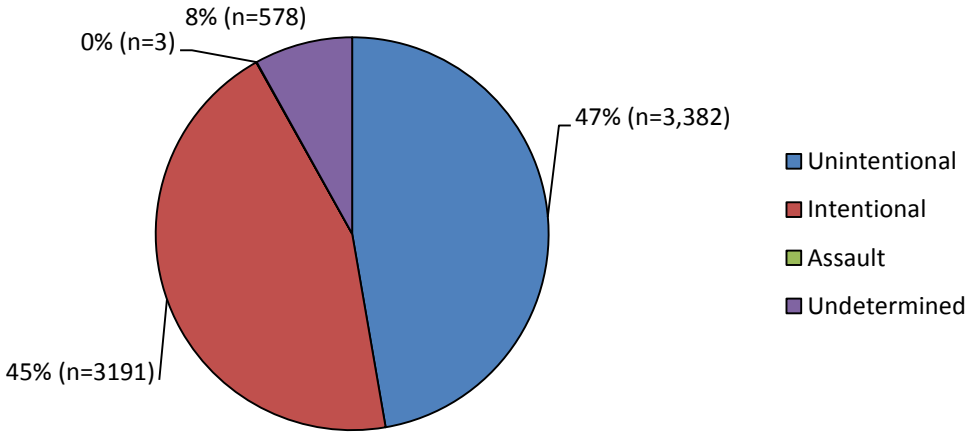


In 2012, the average non-fatal poisoning-related inpatient hospitalization totaled $30,541 in hospital charges and lasted for 3 days (median = $21,043, 2 days). Arizona residents spent a total of 12,817 days in the hospital for non-fatal poisoning-related events. The longest hospital stay for a non-fatal case was 151 days. Hospital charges for non-fatal inpatient hospitalizations due to poisonings totaled over $120 million for Arizona residents in 2012. The single most costly hospitalization totaled $483,407 in hospital charges. Fifty-seven percent of hospital charges for non-fatal poisoning-related inpatient hospitalizations were reportedly paid by Medicare or the Arizona Health Care Cost Containment System (AHCCCS), (3,378 cases; more than $103.5 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

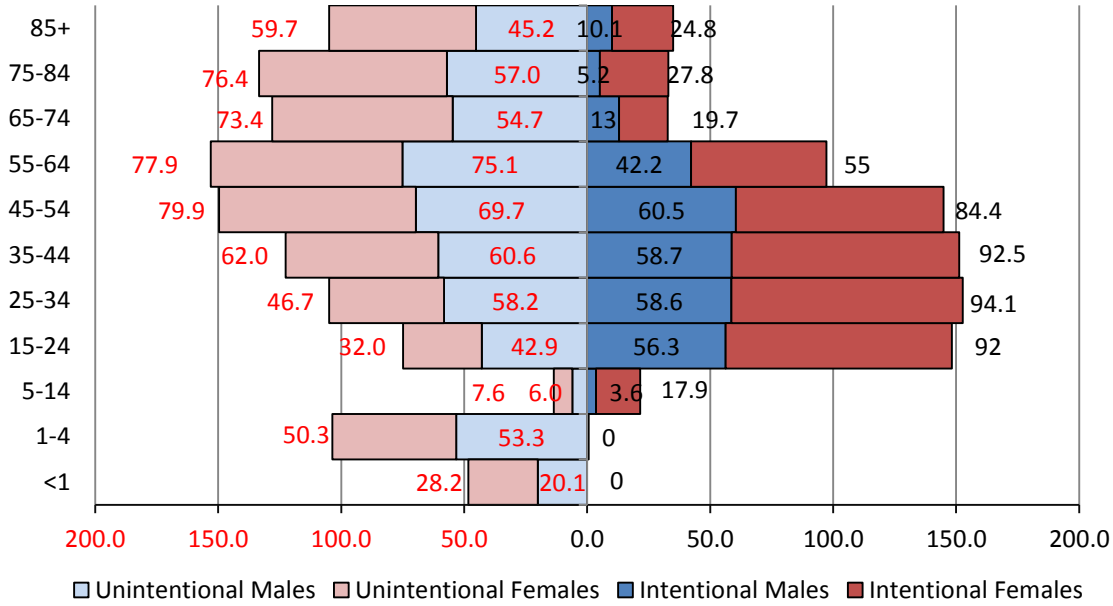
There were 3,382 non-fatal inpatient hospitalizations among Arizona residents attributed to unintentional poisoning in 2012 (47 percent) and 3,191 hospitalizations attributed to intentional poisoning (45 percent). Because the vast majority of hospitalizations fall into one of these two categories, the following section will focus on unintentional and intentional non-fatal poisoning-related hospitalizations. Figure 18 shows the distribution of non-fatal poisoning-related inpatient hospitalizations by manner.

Figure 18. Non-Fatal Poisoning-Related Inpatient Hospitalizations by Manner, Arizona 2012 (n=7,154)



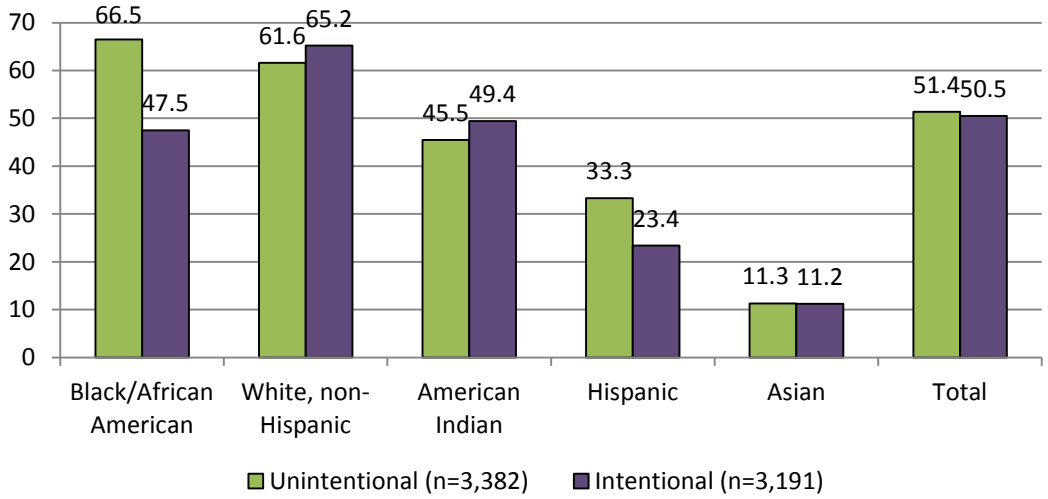
Unintentional poisoning-related hospitalizations were almost evenly distributed between males and females (49 and 51 percent respectively) whereas females represented a greater percentage of intentional poisoning-related hospitalizations (61 percent, n=1,954). Female residents aged 25 through 34 years had the highest rate of intentional non-fatal poisoning-related inpatient hospitalizations of any age group (94.1 per 100,000) in 2012. Male residents aged 55 through 64 had the highest rate of unintentional poisoning-related hospitalization (75.1 per 100,000). In general, the highest rates of intentional poisoning-related hospitalizations were among adults and teenagers aged 15-54, whereas unintentional poisonings were highest among those aged 25 and older. Surprisingly, there was one intentional poisoning-related hospitalization among children under 5 years of age. Figure 19 shows the non-fatal poisoning-related inpatient hospitalization rates per 100,000 Arizona residents by age group and sex, separated by manner.

Figure 19. Age-specific Non-Fatal Poisoning-Related Inpatient Hospitalization Rates per 100,000 Residents by Age, Sex, and Manner, Arizona 2012 (n=6,573)



African American Arizona residents had the highest age-adjusted non-fatal unintentional poisoning-related inpatient hospitalization rate in 2012 (66.5 cases per 100,000 residents), followed by White, non-Hispanic residents (61.6 cases per 100,000 residents). Conversely, White, non-Hispanic residents had the highest age-adjusted non-fatal intentional poisoning-related hospitalization rate (65.2 per 100,000 residents) followed by American Indian (49.4 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 2012.

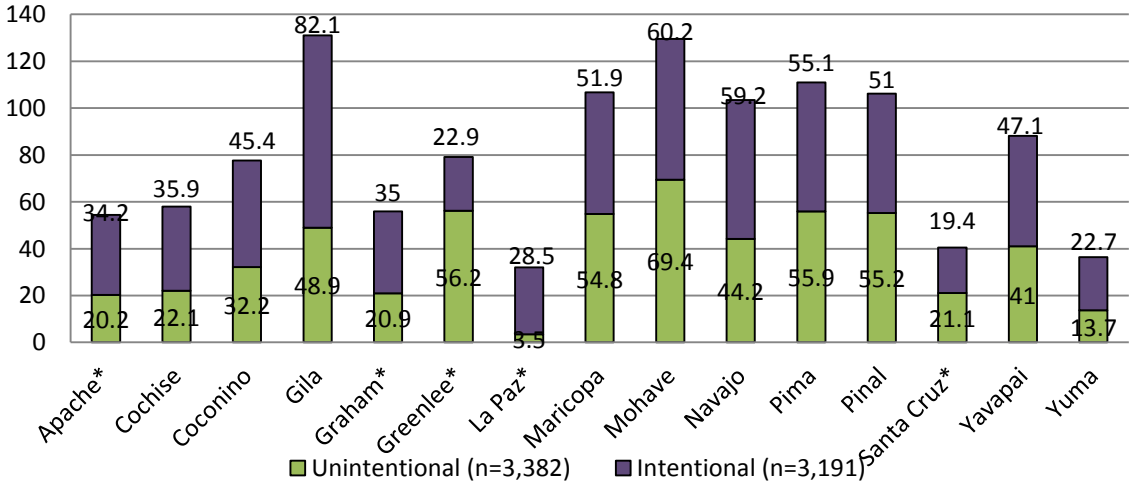
Figure 20. Age-Adjusted Non-Fatal Poisoning-Related Inpatient Hospitalizations Rates per 100,000 Residents by Race/Ethnicity and Manner, Arizona 2012



There were 92 hospitalizations among individuals of other or unknown race/ethnicity.

Mohave County had the highest non-fatal inpatient hospitalization rate for unintentional poisonings (69.4 per 100,000 residents) while Gila County had the highest non-fatal inpatient hospitalization for intentional poisonings (82.1 per 100.000 residents). Non-fatal poisoning-related inpatient hospitalizations were distributed among residents of Arizona's counties as shown in Figure 21.

Figure 21. Age-Adjusted Non-Fatal Poisoning-Related Inpatient Hospitalizations by County and Manner, Arizona 2012

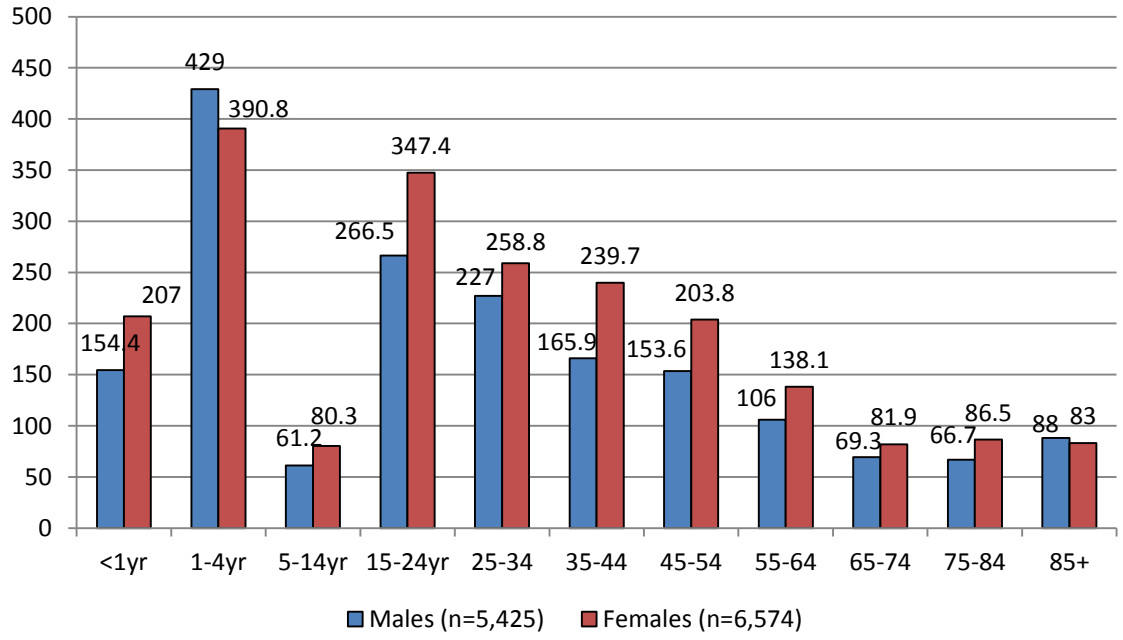


*Rates are unstable due to low counts (n<20)

Non-Fatal Poisoning-Related Emergency Department Visits, 2012

There were 11,999 non-fatal emergency department visits among Arizona residents attributed to non-fatal poisoning in 2012. Forty-five percent of the visits were among males (n=5,425), and 55 percent were among females (n=6,574). Except for children aged 1 through 4 and adults 85 and older, females consistently 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 next 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.[5] 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 22 shows the non-fatal poisoning-related emergency department visits rates per 100,000 Arizona residents by age group and sex.

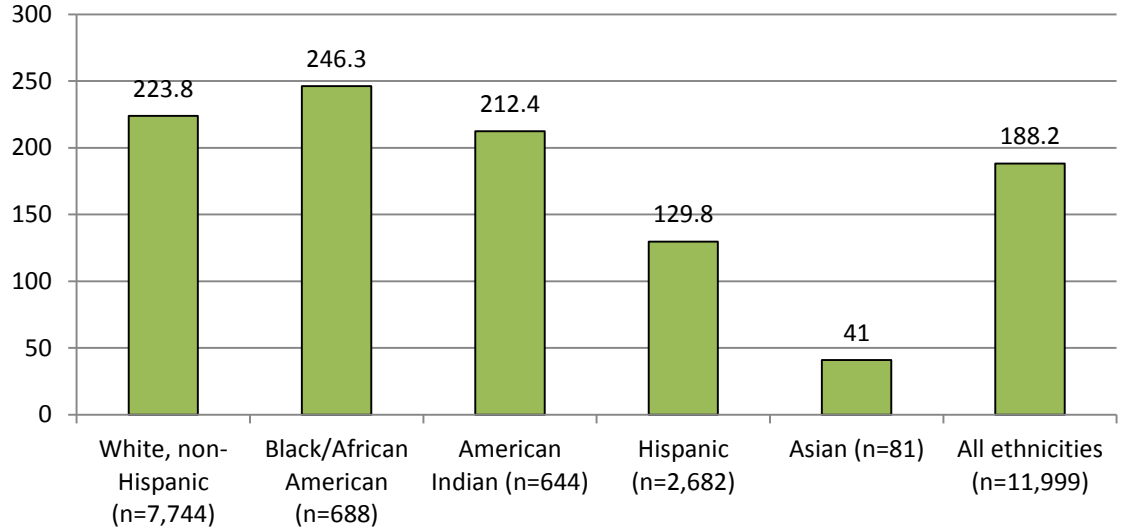
Figure 22. Age-Specific Rates of Non-Fatal Poisoning-Related Emergency Department Visits by Age and Sex, Arizona 2012 (n=11,999)



African American Arizonans had the highest age-adjusted rate of non-fatal poisoning-related emergency department visits (246.3 per 100,000 residents, n=688) followed closely by White, non-Hispanic Arizonans (223.8.2 per 100,000 residents, n=7,744). As with inpatient hospitalizations, the lowest rate was among Asian Americans (41.0 per 100,000 residents). Figure 23 shows the rate distribution of emergency department visits in 2012.

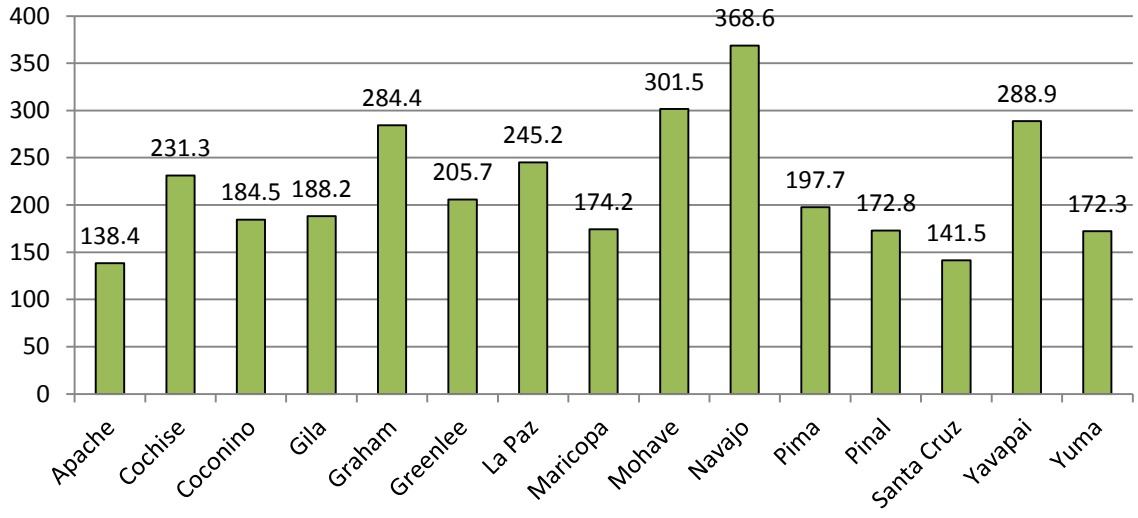
[5] Pitetti RD, Whitman E, Zaylor A. Accidental and Nonaccidental Poisonings as a Cause of Apparent Life-Threatening Events in Infants. *Pediatrics* 2008; 122:e539-e362.

Figure 23. Age-Adjusted Non-Fatal Poisoning-Related Emergency Department Visit Rates per 100,000 Residents by Race/Ethnicity, Arizona 2012 (n=11,999)



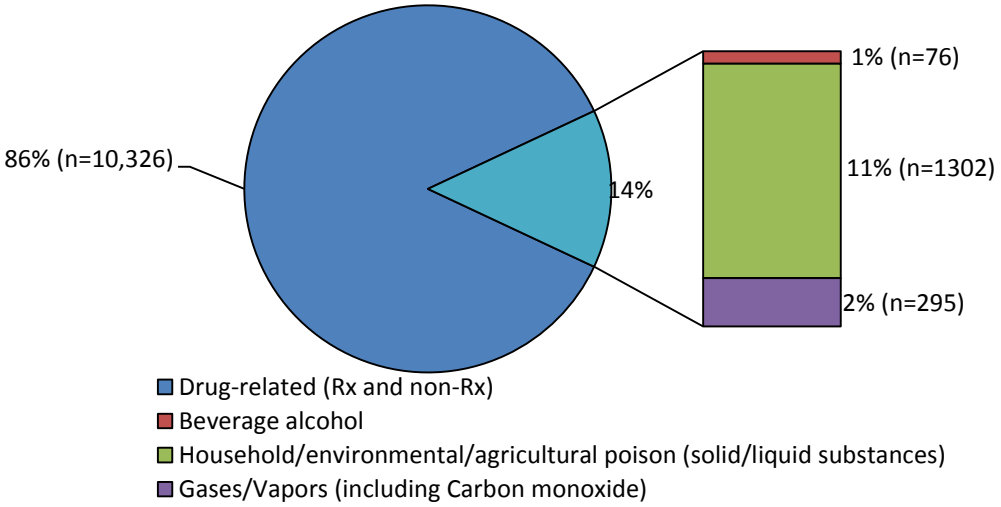
Navajo County had the highest rate of non-fatal poisoning-related emergency department visits in 2012 (368.6 visits per 100,000 residents, n=368), followed by Mohave County (301.5 per 100,000 residents, n=531). It is notable that although several counties had unstable rates for deaths and hospitalizations, 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 24.

Figure 24. Age-Adjusted Non-Fatal Poisoning-Related Emergency Department Visits by County, Arizona 2012 (n=11,999)



As with hospitalizations, the vast majority of non-fatal poisoning-related emergency department visits were due to drugs (86 percent, n=10,326). 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 25.

Figure 25. Non-Fatal Poisoning-Related Emergency Department Visits by Poison Type, Arizona 2012 (n=11,999)

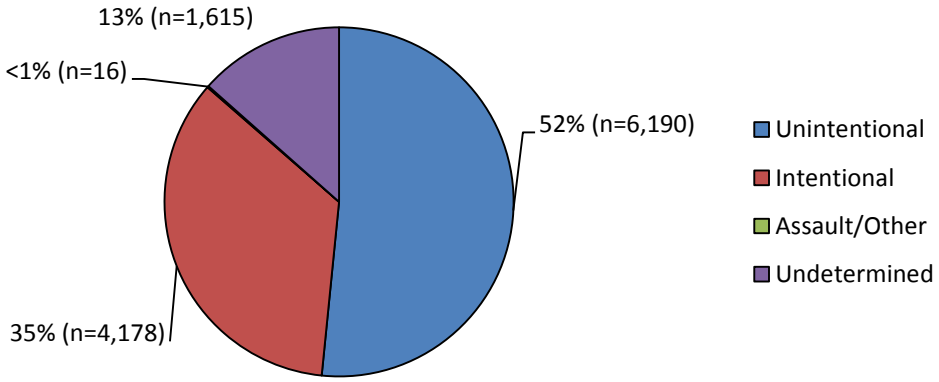


In 2012, the average non-fatal poisoning-related emergency department visit resulted in $4,769 in hospital charges (median=$4,250). Hospital charges for non-fatal emergency department visits due to poisonings among Arizona residents totaled more than $57.2 million in 2012. Forty-seven percent of those hospital charges were reportedly paid by Medicare or the Arizona Health Care Cost Containment System (AHCCCS) (5,937 visits; more than $27.2 million). The single most costly emergency department visit resulted in $160,865 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

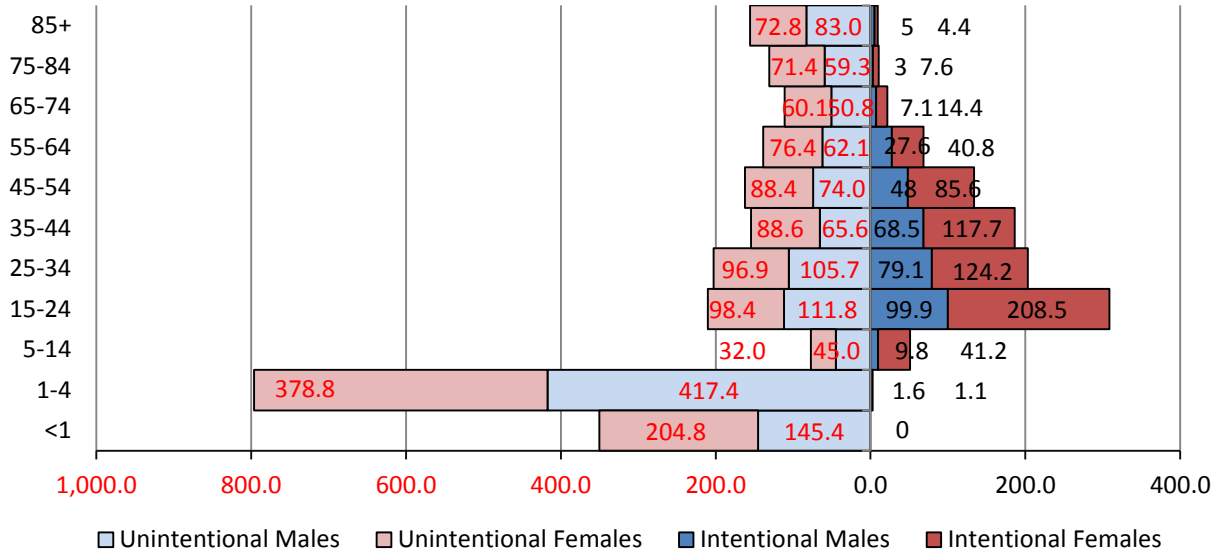
Unlike the distribution among inpatient hospitalizations, a slight majority of non-fatal poisoning-related emergency department visits were identified as being unintentional injuries (52 percent, n=6,190). Thirty-five percent of emergency department visits were attributed to intentional poisonings (n=4,178), poisonings of undetermined intent accounted for 13 percent of visits (n=1,615), and there were 16 visits from poisonings due to assaults or other intents (legal intervention). Figure 26 shows the distribution of non-fatal emergency department visits by manner.

Figure 26. Non-Fatal Poisoning-Related Emergency Department Visits by Manner, Arizona 2012 (n=11,999)



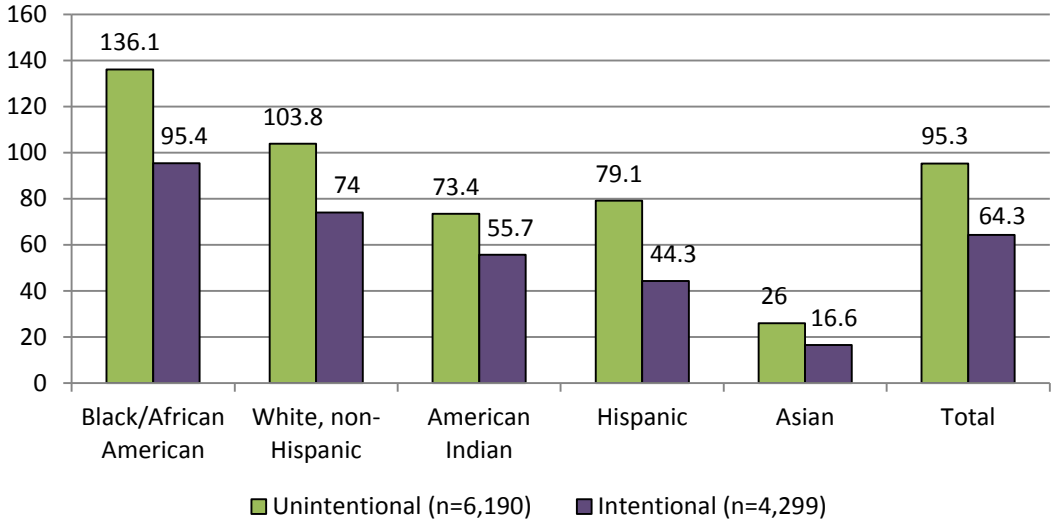
Children younger than five years of age had the highest rates of non-fatal unintentional poisoning-related emergency department visits among both males and females (417.4 per 100,000 residents and 378.8 per 100,000 residents, respectively). Males had higher rates of non-fatal, unintentional poisoning-related emergency department visits among Arizona residents aged 15 through 34. Females in all age groups had higher rates of intentional poisoning-related visits, with the highest rate being among females aged 15 through 24 (208.5 per 100,000). This age group also represented the highest rate among males (99.9 per 100,000 residents). Figure 27 shows the non-fatal poisoning-related emergency department visit rates per 100,000 Arizona residents by age group and sex, separated by manner.

Figure 27. Non-fatal Poisoning-Related Emergency Department Visit Rates per 100,000 Residents by Age Group, Manner, and Sex, Arizona 2012



The highest rates of non-fatal emergency department visits were among African American and White residents for both unintentional (136.1 per 100,000 residents and 103.8 per 100,000 residents, respectively) and intentional (95.4 per 100,000 residents and 74.0 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 28 shows the distribution of emergency department visits by race/ethnicity and manner.

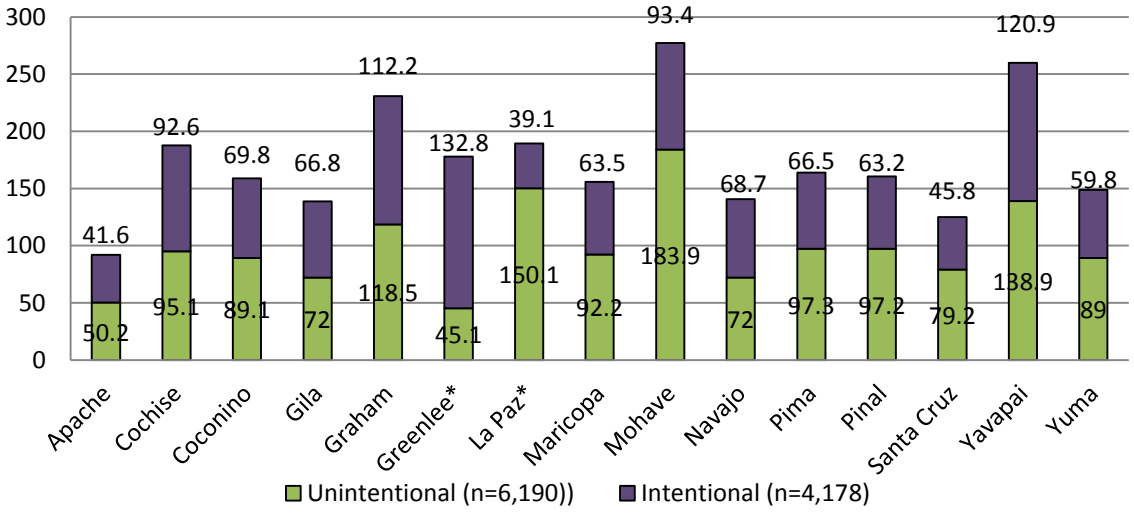
Figure 28. Age-Adjusted Non-Fatal Poisoning-Related Emergency Department Visit Rates per 100,000 Residents by Race/Ethnicity and Manner, Arizona 2012



There were 116 hospitalizations among individuals of other or unknown race/ethnicity.

Mohave and La Paz Counties had the highest non-fatal emergency department visit rates for both unintentional poisonings (183.9 per 100,000 residents and 150.1 per 100,000 residents, respectively).Greenlee County had the highest non-fatal emergency department visit rate for intentional poisoning (132.8 per 100,000 residents) followed closely by Yavapai County (120.9 per 100,000 residents). Non-fatal poisoning-related emergency department visits were distributed among residents of Arizona's counties as shown in Figure 29.

Figure 29. Age-Adjusted Non-Fatal Poisoning-Related Emergency Department Visits by County and Manner, Arizona 2012



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

Poisoning and Prescription Drug Overdoses as an Arizona Public Health Concern

Deaths

- In 2012, poisoning was the leading cause of injury-related deaths (24 percent) accounting for more deaths among Arizonans than car crashes, falls, or firearm injuries.

- Between 2008 and 2012, the age-adjusted poisoning-related mortality rate increased 5 percent for Arizona residents, due largely to increases in unintentional poisoning rates.

- Prescription drugs, often combined with alcohol, were responsible for many poison-related deaths. The poisons most commonly specified on death certificates in 2012 were alcohol (18 percent, n=198), Oxycodone or Hydrocodone (16 percent, n=179), and methamphetamine (10 percent, n=108). Heroin was listed in 8 percent of cases (n=91).

- In 2012, as in previous years, poisoning-related fatality rates were highest among American Indian (28.3 per 100,000 residents) and White, non-Hispanic Arizonans (20.0 per 100,000 residents).

Non-Fatal Hospitalizations and Emergency Department Visits

- Between 2008 and 2012, the age-adjusted rate of non-fatal poisoning-related inpatient hospitalizations among Arizona residents increased 21 percent, from 99.1 cases per 100,000 residents in 2008 to 111.0 cases in 2012.

- Adult women had the highest rates of non-fatal poisoning-related inpatient hospitalizations. Females 45 through 54 years of age had a rate of 179.6 cases per 100,000 residents, and females 35 through 44 years of age had a rate of 166.3 cases per 100,000 residents.
- In 2012, there were 11,999 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 (429.0 per 100,000 for males, 390.8 per 100,000 for females). These rates represent a 4 percent increase for males and 6 percent increase for females since 2011
- Hospital charges for non-fatal poisoning-related inpatient hospitalizations totaled more than $120 million in 2012, and Arizona residents spent a total of 12,817 days hospitalized for non-fatal poisonings.
- Hospital charges for non-fatal poisoning-related emergency department visits totaled over $57.2 million in 2012.

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 2008 through 2012 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.

Table 7. International Classification of Diseases, 10th Revision (ICD-10) Codes Used 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 2008 through 2012 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 2008, 2009,2011 and 2012 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.