

Firearm Deaths in Arizona, 2015-2017



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for Public Policy
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Summary

The purpose of this report is to provide descriptive statistics about firearm deaths in Arizona from 2015 to 2017. This report relies on data provided by officially collected and reported information from death certificates, law enforcement and medical examiner reports.

Major findings include:

- There were 3,188 firearm deaths between January 1, 2015, and December 31, 2017.
- Suicides accounted for 71% of all firearm deaths and homicides accounted for 23% of all firearm deaths.
- The number of homicides, suicides and unintentional firearm deaths increased from 2015 to 2017.
- The firearm death rate for homicides, suicides and unintentional firearm deaths also increased.
- The most common location for homicides (49%) and suicides (74%) was in a house or apartment.
- Handguns were used in 62% of all homicides and 80% of all suicides and unintentional firearm deaths.
- Among firearm deaths of a female, 30% of them were homicides and 70% were suicides. Among firearm deaths of a male, 24% were homicides and 76% suicides.¹
- White people are disproportionately affected by suicide by firearm, accounting for 93% of firearm suicide deaths.
- Homicide victims are disproportionately more likely to be black or American Indian.
- Semiautomatic weapons accounted for 51% of all homicides, 68% of all suicides, and 74% of all unintentional firearm deaths.

¹ These proportions between the sexes differ in a statistically significant way based on a z-score test of proportion conducted at $\alpha=0.05$ level.



Introduction

In 2005, Arizona State University established the Center for Violence Prevention and Community Safety (CVPCS) to respond to the growing need of Arizona's communities to improve the public's safety and well-being. CVPCS is a research unit within the Watts College of Public Service and Community Solutions at Arizona State University. The mission of CVPCS is to generate, share and apply quality research and knowledge to create best practice standards.

CVPCS houses the data from the Arizona Violent Death Reporting System (AZ-VDRS), which is provided to the National Violent Death Reporting System (NVDRS). The NVDRS is a state-based surveillance tool to improve our understanding of violent deaths. Currently, all 50 states, plus Puerto Rico and the District of Columbia, participate in the NVDRS. NVDRS was developed by the Centers for Disease Control and Prevention (CDC). Arizona began its partnership in the surveillance system with the collection of 2015 violent death data. The primary goal of NVDRS is to provide high quality data useful for prevention of all types of violence, including homicide, suicide, unintentional firearm deaths, legal intervention, and deaths for which intent could not be determined.

In 2019, Morrison Institute for Public Policy partnered with CVPCS to compile, analyze and report on all firearm deaths in a three-year period. Through the mechanisms of data integration and abstraction from death certificates, autopsy and toxicology reports, and law enforcement investigations, the AZ-VDRS, as an NVDRS partner, seeks to contribute to public understanding of firearm deaths in Arizona. Understanding the scope and nature of firearm deaths at state and local levels informs local and state authorities, policymakers and other stakeholders. This report presents findings from the AZ-VDRS from 2015-2017.

Data and Methods

Data presented in this report are from AZ-VDRS, from January 1, 2015, through December 31, 2017. The firearm data are collected from four principal sources and used to populate an aggregated, anonymous database. The four sources are death certificates, medical examiner reports, law enforcement reports and crime laboratory records. AZ-VDRS contains data on victim/suspect demographics and specific circumstances about the incident including, but not limited to, mental health problems, recent problems with a job, finances, relationships, and physical health problems. These original data sources are de-identified, abstracted and aggregated into a CDC-managed database.

Data collection and abstraction in Arizona begins with the death certificate. The Arizona Department of Health Services and its Bureau of Vital Records on a monthly basis provide AZ-VDRS with a comprehensive death certificate file containing year-to-date deaths. The deaths are defined by codes from the International Statistical Classification of Diseases and Related Health Problems, 10th revision (ICD-10), which encompass all manner of suicide, homicide, legal intervention, unintentional firearm injuries, and deaths of undetermined intent. Information requests are then made for each decedent. Requests are made to the responsible medical examiner for autopsy and toxicology reports and to the relevant law enforcement jurisdiction for all incident and investigation reports.

This report uses data gathered on all violent firearm death decedents in the AZ-VDRS database with a date of death from January 1, 2015, through December 31, 2017. Some analyses in this report are presented using rates. Rates for this report are calculated using incidence counts per 100,000 population, as estimated by the U.S. Census Bureau, specifically the 2015 American Community Survey 5-Year Estimates.

This report's description of Arizona's firearm death data is organized by topic, including manner of death, demographics, location of death, firearm type and firing action category.

Findings

Manner of Death

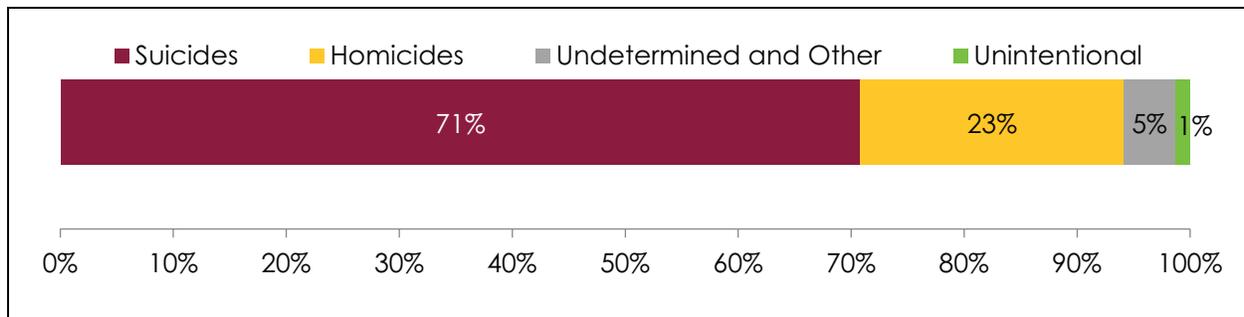
There were 3,188 gun deaths from 2015-2017 in Arizona. Figure 1 shows the number of firearm deaths per year and as a proportion of total firearm deaths for all three years in the dataset.

Figure 1: Firearm Deaths, 2015-2017

Year	Number of Gun Deaths	Proportion
2015	961	30%
2016	1,095	34%
2017	1,132	36%
Total	3,188	100%

Figure 2 shows the proportion of firearm deaths by manner of death: suicides, homicides, undetermined and other, and unintentional. Suicides comprised 71% of all firearm deaths from 2015-2017 and 23% were homicides.

Figure 2: Proportion of Firearm Deaths by Manner of Death, 2015-2017



Suicides, Homicides and Unintentional Firearm Deaths by Year

Figure 3 shows yearly death rates by manner of death. Homicide, suicide and unintentional firearm death rates, per 100,000, increased from 2015 to 2017.

Figure 3: Firearm Death Rates per 100,000 Population by Year

	2015	2016	2017
Homicides	3.13	4.01	3.89
Suicides	10.57	11.27	11.72
Legal Intervention	0.56	0.58	0.53
Unintentional Deaths	0.08	0.18	0.37
Undetermined Intent	0.14	0.24	0.12

Figure 4 shows the number of suicides by firearm each year in Arizona. There was a 14% increase in the number of suicides from 2015 (702) to 2017 (798).

Figure 4: Number of Suicides by Firearm by Year

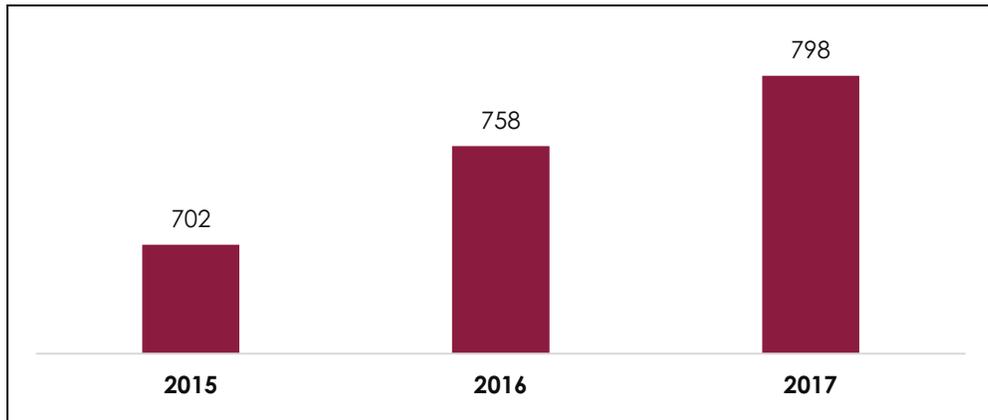


Figure 5 shows the number of homicides by firearm each year in Arizona. From 2015 to 2017 there was a 27% increase in the number of homicides from 2015 (208) to 2017 (265).

Figure 5: Number of Homicides by Firearm by Year

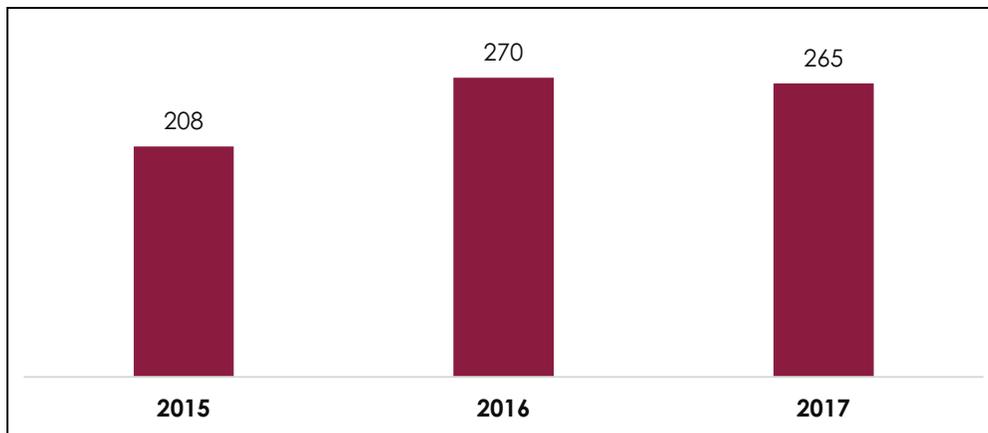
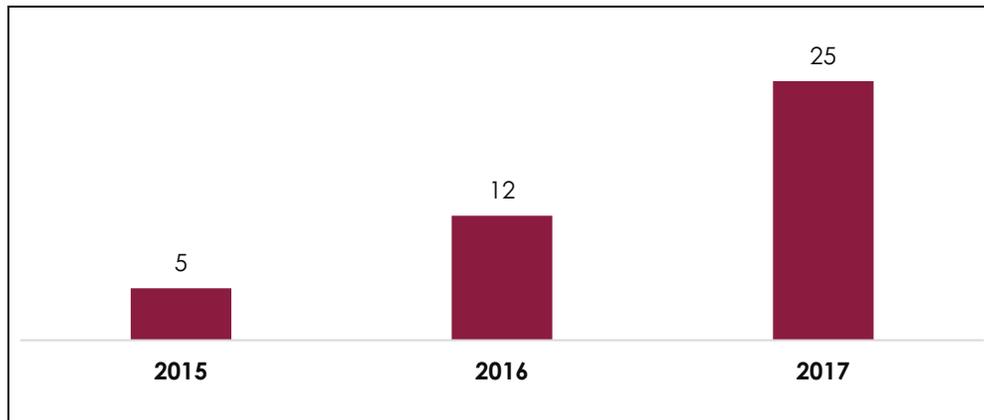


Figure 6 shows the number of unintentional firearm deaths each year in Arizona. The number of unintentional firearm deaths went up from five deaths in 2015 to 25 in 2017.

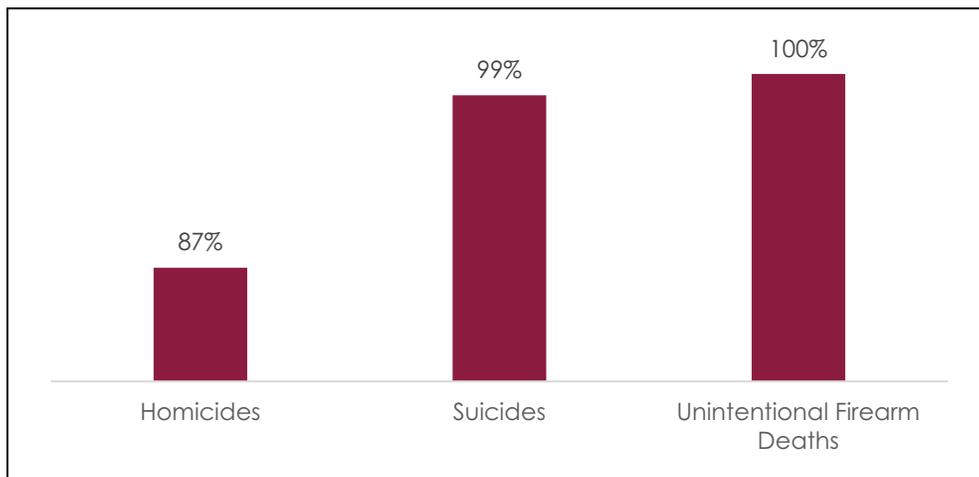
Figure 6: Number of Unintentional Firearm Deaths by Year



Number of Victims per Incident

Overall, 92% of Arizona's firearm death incidents had a single victim. Among all firearm deaths, homicides were the manner of death most likely to have multiple victims in a single incident. Figure 7 shows the percentage of firearm incidents with a single victim by manner of death.

Figure 7: Percentage of Firearm Incidents with a Single Victim by Manner of Death



Demographics

Age

From 2015 to 2017, homicide deaths by firearm occurred the most frequently in ages 25-44 (360) followed by ages 15-24 (184) and ages 45-64 (147). Suicide deaths with a firearm increased by each age category until age 65 (743). Figure 8 shows these trends.

Figure 8: Number of Homicides and Suicides by Age Category, 2015-2017

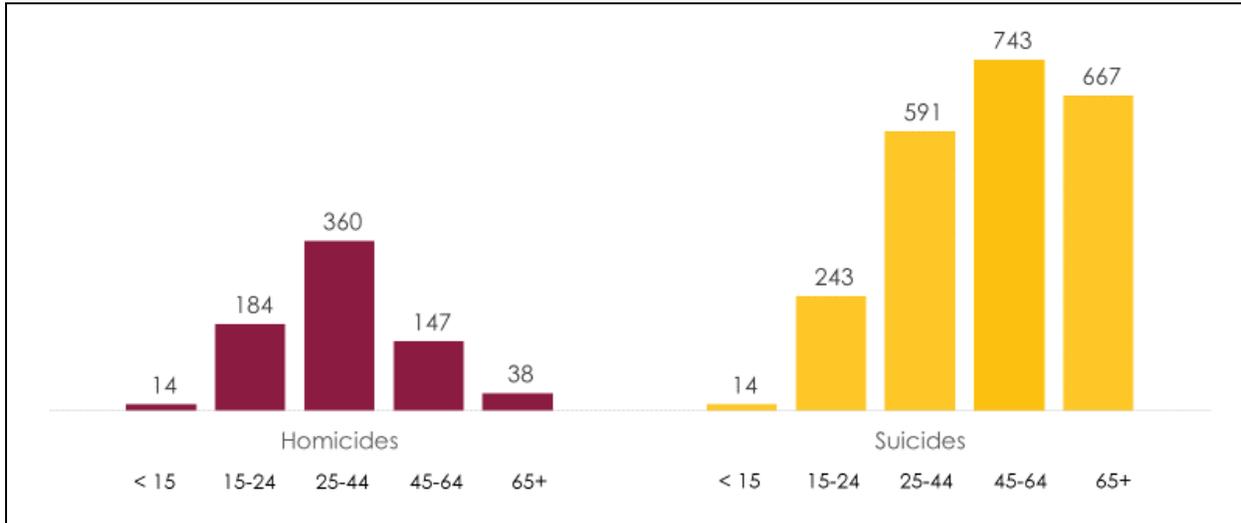


Figure 9 shows the number and rate (per 100,000 population) of all firearm deaths, homicides and suicides by age category.

Figure 9: Firearm Deaths by Age and Manner of Death²

All Deaths, all Years				Homicides, all Years				Suicides, all Years			
	Number	Percentage			Number	Percentage			Number	Percentage	
< 15	31	1%		< 15	14	2%		< 15	14	1%	
15-24	476	15%		15-24	184	25%		15-24	243	11%	
25-44	1,044	33%		25-44	360	48%		25-44	591	26%	
45-64	917	29%		45-64	147	20%		45-64	743	33%	
65+	720	23%		65+	38	5%		65+	667	30%	
All Deaths, 2015				Homicides, 2015				Suicides, 2015			
	Number	Percentage	Rate		Number	Percentage	Rate		Number	Percentage	Rate
< 15	9	1%	0.67	< 15	n<5	n/a	n/a	< 15	5	1%	0.37
15-24	149	16%	15.94	15-24	63	30%	6.74	15-24	77	11%	8.24
25-44	314	33%	18.26	25-44	96	46%	5.58	25-44	192	27%	11.17
45-64	276	29%	17.02	45-64	36	17%	2.22	45-64	230	33%	14.18
65+	213	22%	20.88	65+	9	4%	0.88	65+	198	28%	19.41
All Deaths, 2016				Homicides, 2016				Suicides, 2016			
	Number	Percentage	Rate		Number	Percentage	Rate		Number	Percentage	Rate
< 15	6	1%	0.45	< 15	5	2%	0.37	< 15	0	0%	
15-24	156	14%	16.57	15-24	58	21%	6.16	15-24	76	10%	8.07
25-44	354	32%	20.40	25-44	131	49%	7.55	25-44	187	25%	10.78
45-64	322	29%	19.69	45-64	59	22%	3.61	45-64	258	34%	15.78
65+	257	23%	24.02	65+	17	6%	1.59	65+	237	31%	22.15
All Deaths, 2017				Homicides, 2017				Suicides, 2017			
	Number	Percentage	Rate		Number	Percentage	Rate		Number	Percentage	Rate
< 15	16	1%	1.19	< 15	5	2%	0.37	< 15	9	1%	0.67
15-24	171	15%	18.08	15-24	63	24%	6.66	15-24	90	11%	9.52
25-44	376	33%	21.37	25-44	133	50%	7.56	25-44	212	27%	12.05
45-64	319	28%	19.33	45-64	52	20%	3.15	45-64	255	32%	15.45
65+	250	22%	22.60	65+	12	5%	1.08	65+	232	29%	20.97

² The Center for Disease Control does not allow reporting counts of people that total less than five. These numbers have been replaced by n<5 in all tables in this report.

Sex

Overall, women accounted for 17% of all firearm death victims, with 534 deaths among the 3,188 deaths in this three-year time period. Among female firearm deaths, 30% were homicides. Among male firearm deaths, 24% were homicides. Also among female firearm deaths, 70% were suicides. Among male firearm deaths, 76% were suicides. These proportions between the sexes differ in a statistically significant way.³ Figure 10 depicts homicides and suicides only, not unintentional or undetermined firearm deaths.

Figure 10: Firearm Deaths: Homicides and Suicides by Sex

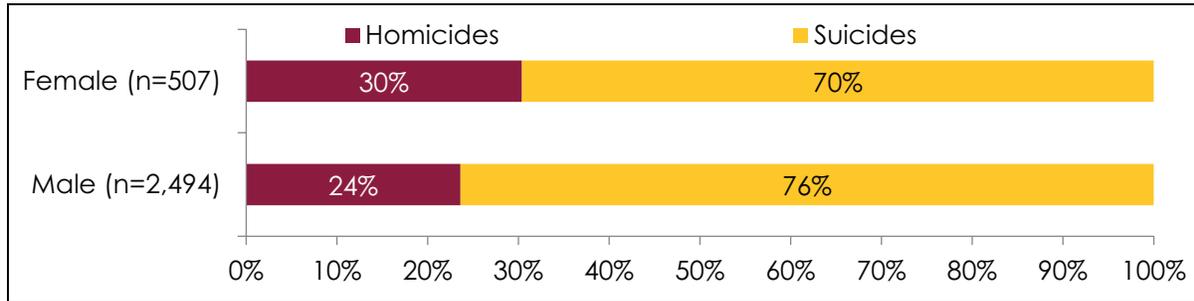


Figure 11 shows the number and rate (per 100,000 population) of all firearm deaths, homicides and suicides by sex and year. Women had lower firearm homicide death rates and lower firearm suicide death rates in all three years.

Figure 11: Firearm Deaths by Sex and Manner of Death

All Deaths, all Years				Homicides, all Years				Suicides, all Years			
	Number	Percentage			Number	Percentage			Number	Percentage	
Female	534	17%		Female	154	21%		Female	353	16%	
Male	2,654	83%		Male	589	79%		Male	1,905	84%	
All Deaths, 2015				Homicides, 2015				Suicides, 2015			
	Number	Percentage	Rate		Number	Percentage	Rate		Number	Percentage	Rate
Female	161	17%	4.82	Female	40	19%	1.20	Female	115	16%	3.44
Male	800	83%	24.25	Male	168	81%	5.09	Male	587	84%	17.79
All Deaths, 2016				Homicides, 2016				Suicides, 2016			
	Number	Percentage	Rate		Number	Percentage	Rate		Number	Percentage	Rate
Female	193	18%	5.70	Female	63	23%	1.86	Female	117	15%	3.46
Male	902	82%	26.97	Male	207	77%	6.19	Male	641	85%	19.17
All Deaths, 2017				Homicides, 2017				Suicides, 2017			
	Number	Percentage	Rate		Number	Percentage	Rate		Number	Percentage	Rate
Female	180	16%	5.26	Female	51	19%	1.49	Female	121	15%	3.53
Male	952	84%	28.12	Male	214	81%	6.32	Male	677	85%	20.00

³ Based on a z-score test of proportion conducted at $\alpha=0.05$ level.

Race and Ethnicity

Overall, white people accounted for the most gun deaths from 2015-2017 in Arizona (86%), followed by black people (7%) and American Indians (3%).⁴ White people were statistically significantly over-represented among suicide victims, accounting for 93% of all firearm suicides from 2015-2017.⁵ Black people and American Indians were statistically significantly over-represented among homicide victims.⁶ Figure 12 reports this data.

Figure 12: Firearm Deaths by Race and Manner of Death

All Deaths, all Years				Homicides, all Years				Suicides, all Years			
	Number	Percentage			Number	Percentage			Number	Percentage	
Black	215	7%		Black	148	20%		Black	55	2%	
American Indian	112	3%		American Indian	58	8%		American Indian	38	2%	
White	2,762	86%		White	503	67%		White	2,109	93%	
Asian/Pacific Islander	52	2%		Asian/Pacific Islander	16	2%		Asian/Pacific Islander	34	1%	
Unspecified	66	2%		Unspecified	24	3%		Unspecified	34	1%	
All Deaths, 2015				Homicides, 2015				Suicides, 2015			
	Number	Percentage	Rate		Number	Percentage	Rate		Number	Percentage	Rate
Black	56	6%	19.89	Black	41	20%	14.56	Black	13	2%	4.62
American Indian	31	3%	10.52	American Indian	16	8%	5.43	American Indian	10	1%	3.39
White	845	90%	16.22	White	142	70%	2.73	White	663	96%	12.72
Asian/Pacific Islander	11	1%	5.17	Asian/Pacific Islander	n<5	n/a	n/a	Asian/Pacific Islander	7	1%	3.29
All Deaths, 2016				Homicides, 2016				Suicides, 2016			
	Number	Percentage	Rate		Number	Percentage	Rate		Number	Percentage	Rate
Black	78	7%	27.17	Black	58	22%	20.20	Black	17	2%	5.92
American Indian	32	3%	10.78	American Indian	19	7%	6.40	American Indian	6	1%	2.02
White	947	88%	18.09	White	179	68%	3.42	White	713	95%	13.62
Asian/Pacific Islander	23	2%	10.55	Asian/Pacific Islander	8	3%	3.67	Asian/Pacific Islander	13	2%	5.96
All Deaths, 2017				Homicides, 2017				Suicides, 2017			
	Number	Percentage	Rate		Number	Percentage	Rate		Number	Percentage	Rate
Black	81	7%	27.66	Black	49	19%	16.73	Black	25	3%	8.54
American Indian	49	4%	16.32	American Indian	23	9%	7.66	American Indian	22	3%	7.33
White	970	87%	18.38	White	182	71%	3.45	White	733	92%	13.89
Asian/Pacific Islander	18	2%	7.80	Asian/Pacific Islander	n<5	n/a	n/a	Asian/Pacific Islander	14	2%	6.07

Figure 13 shows data on ethnicity by manner of death. Hispanic people comprise 29% of Arizona's population, but represented 19% of all firearm deaths overall. Compared to the general population, Hispanic people were statistically significantly over-represented among homicide victims in Arizona (38%).⁷ Hispanic people had higher homicide firearm death rates and lower suicide firearm death rates than non-Hispanic people in all three years.

⁴ Rates were populated from the ACS 5-Year Estimates. The Census categories for Asian, Native Hawaiian, and Other Pacific Islander were combined to compare with the AZ-VDRS category "Asian/Pacific Islander." In AZ-VDRS, Native Hawaiians are included in the category of "Asian/Pacific Islander." In addition, the Census categories for American Indian and Alaskan Native were combined to compare with the AZ-VDRS category "American Indian." In AZ-VDRS, Alaskan Natives are included in the category "American Indian."

⁵ Based on a z-score test of proportion conducted at $\alpha=0.05$ level.

⁶ Ibid.

⁷ Ibid.

Figure 13: Firearm Deaths by Ethnicity and Manner of Death

All Deaths, all Years				Homicides, all Years				Suicides, all Years			
	Number	Percentage			Number	Percentage			Number	Percentage	
Hispanic	618	19%		Hispanic	286	38%		Hispanic	271	12%	
Not Hispanic	2510	79%		Not Hispanic	441	59%		Not Hispanic	1951	86%	
Unknown	60	2%		Unknown	16	2%		Unknown	36	2%	
All Deaths, 2015				Homicides, 2015				Suicides, 2015			
	Number	Percentage	Rate		Number	Percentage	Rate		Number	Percentage	Rate
Hispanic	158	16%	7.84	Hispanic	73	35%	3.62	Hispanic	73	10%	3.62
Not Hispanic	774	81%	16.73	Not Hispanic	130	63%	2.81	Not Hispanic	610	87%	13.18
Unknown	29	3%		Unknown	5	2%		Unknown	19	3%	
All Deaths, 2016				Homicides, 2016				Suicides, 2016			
	Number	Percentage	Rate		Number	Percentage	Rate		Number	Percentage	Rate
Hispanic	217	20%	10.56	Hispanic	100	37%	4.87	Hispanic	93	12%	4.53
Not Hispanic	850	78%	18.19	Not Hispanic	161	60%	3.44	Not Hispanic	648	85%	13.86
Unknown	28	3%		Unknown	9	3%		Unknown	17	2%	
All Deaths, 2017				Homicides, 2017				Suicides, 2017			
	Number	Percentage	Rate		Number	Percentage	Rate		Number	Percentage	Rate
Hispanic	243	21%	11.55	Hispanic	113	43%	5.37	Hispanic	105	13%	4.99
Not Hispanic	886	78%	18.83	Not Hispanic	150	57%	3.19	Not Hispanic	693	87%	14.72
Unknown	n<5	n/a	n/a	Unknown	n<5	n/a	n/a	Unknown	0	0%	

Relationship Between Suspect and Victim in Homicides

Figure 14 shows the most common victim-suspect relationship combinations in Arizona's firearm homicide data. The most common victim-suspect relationships in homicides are: relationship unknown (28%), stranger (19%), acquaintance (13%), friend (7%) and spouse (7%).

Figure 14: Most Common Victim-Suspect Relationships by Homicides

<u>Relationship</u>	<u>Percentage</u>
Relationship Unknown	28%
Stranger	19%
Acquaintance	13%
Friend	7%
Spouse	7%

Firearm Deaths by Location

The most common locations for homicides involving a firearm are listed in Figure 15. Roughly half of all firearm homicides occurred in a house or an apartment, 15% on a street/road, sidewalk or alley, 9% in a parking lot/public parking garage, 6% in a motor vehicle and 5% in an unknown location.

Figure 15: Most Common Locations of Homicides

<u>Location</u>	<u>Percentage</u>
House, apartment	49%
Street/road, sidewalk, alley	15%
Parking lot/public parking garage	9%
Motor vehicle (excluding school bus and public transportation)	6%
Unknown	5%

The most frequent locations for suicide involving a firearm are listed in Figure 16. About three-fourths of all suicides took place in a house or apartment, 6% in a motor vehicle, 6% in a natural area, 4% on a street/road, sidewalk or alley, and 3% in a parking lot/public parking garage.

Figure 16: Suicide Involving a Firearm, Most Frequent Locations

<u>Location</u>	<u>Percentage</u>
House, apartment	74%
Motor vehicle (excluding school bus and public transportation)	6%
Natural area (e.g., field, river, beaches, woods)	6%
Street/road, sidewalk, alley	4%
Parking lot/public parking garage	3%

Firearm Deaths by Gun Type and Firing Action Category

There were 25 different gun/firing action category types in the AZ-VDRS dataset. We combined categories to break gun type/firing action type into four gun type categories and four firing action categories.⁸

Figure 17 shows the gun types included in each of our four gun type categories: handgun, rifle, shotgun, and other or unknown. Figure 18 shows the gun types included in each of our firing action categories: fully automatic, semiautomatic, single shot, and other or unknown.

⁸ We were informed by "Targeting Guns: Firearms and Their Control" by Gary Kleck, (Transaction Publishers, 1997).

Figure 17: Gun Type Categories

<u>Handgun</u>	<u>Rifle</u>	<u>Shotgun</u>	<u>Other and Unknown</u>
Handgun, Pistol-bolt action	Rifle-shotgun combination	Shotgun, automatic	Submachine gun
Handgun, Pistol-Derringer	Rifle, automatic	Shotgun, bolt action	Long gun, unknown type
Handgun, Pistol semiautomatic	Rifle, bolt action	Shotgun, double barrel	Other (handmade gun)
Handgun, Pistol single shot	Rifle, lever action	Shotgun, pump action	Unknown
Handgun, Revolver	Rifle, pump action	Shotgun, semiautomatic	
Handgun, unknown type	Rifle, semiautomatic	Shotgun, single shot	
	Rifle, single shot	Shotgun, unknown type	
	Rifle, unknown type		

Figure 18: Firing Action Categories

<u>Fully Automatic</u>	<u>Semiautomatic</u>	<u>Single Shot</u>	<u>Other and Unknown</u>
Submachine gun	Handgun, Pistol-bolt action	Handgun, Pistol-Derringer	Handgun, unknown type
Rifle, automatic	Handgun, Pistol semi-automatic	Handgun, Pistol single shot	Long gun, unknown type
Shotgun, automatic	Handgun, Revolver	Rifle-shotgun combination	Other, (handmade gun)
	Rifle, bolt action	Rifle, lever action	Rifle, unknown type
	Rifle, pump action	Rifle, single shot	Shotgun, unknown type
	Rifle, semiautomatic	Shotgun, double barrel	Unknown
	Shotgun, bolt action	Shotgun, single shot	
	Shotgun, pump action		
	Shotgun, semiautomatic		

The following figures present AZ-VDRS firearm data by gun type and firing action category. Figure 19 shows the percent of gun types for each manner of death: homicides, suicides and unintentional firearm deaths. Handguns accounted for 62% of all homicides and 80% of both suicides and unintentional firearm deaths. Rifles accounted for 7% of homicides and 5% of suicides and unintentional firearm deaths. Shotguns accounted for 5% of all homicides and 7% of both suicides and unintentional firearm deaths. Other and unknown gun types accounted for 27% of all homicides and 8% of both suicides and unintentional firearm deaths.

Figure 19: Manner of Death by Gun Type

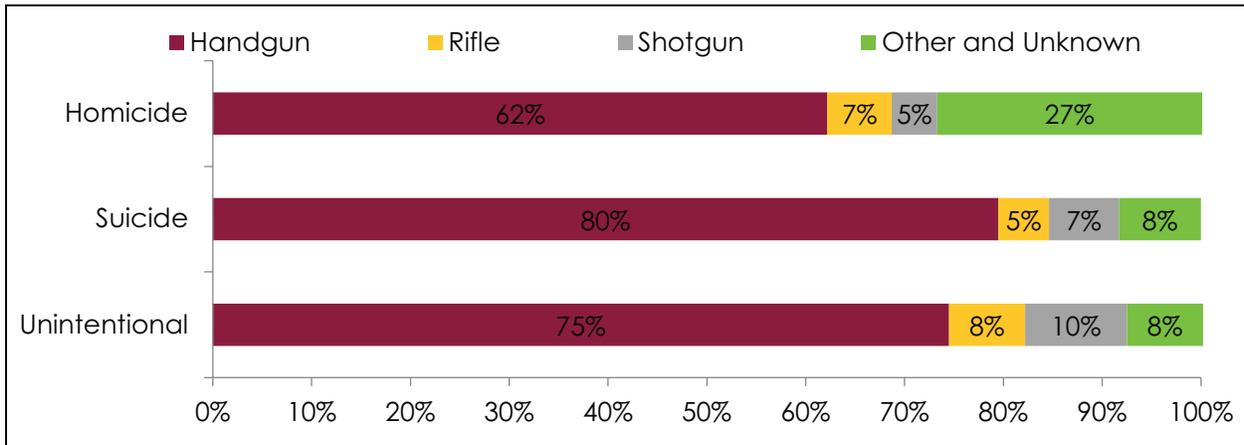


Figure 20 below shows the percent of firing action categories used for each manner of death: homicides, suicides and unintentional firearm deaths. Semiautomatic firearms accounted for 51% of all homicides, 68% of all suicides, and 74% of all unintentional firearm deaths. Guns that were classified as other or unknown accounted for 48% of all homicides, 29% of all suicides and 23% of all unintentional firearm deaths. Fully automatic firearms accounted for 0.6% of homicides, 0.3% of suicides and 0% of unintentional firearm deaths.

Figure 20: Manner of Death by Firing Action Category

