



Suicide Surveillance Report, Arizona, 2022

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Intended Audience

This is a technical report on the analysis of the incidence and risks associated with suicide death and self-inflicted injury in Arizona. This report is aimed primarily at those actively involved in the prevention, intervention, and postvention related to suicide and self-inflicted injury, including healthcare providers, community service providers, researchers, policymakers, law enforcement, and other stakeholders. While publicly available, the intended audience of this report is not the general public, and extra care in the use or interpretation of this report should be taken by those with limited background or subject-matter expertise in the areas of mental health disorders.

How to Use This Report

This report describes the incidence of suicide deaths and self-inflicted injuries in Arizona, as well as a variety of risk- and associated-factors contributing to these events among individuals in Arizona. The key findings presented in this report should assist in identifying future targets for intervention and guide effective and evidence-based efforts toward reducing mental health disorder outcomes.

Disclaimer

Previous ADHS Suicide Surveillance Reports

The findings in this report were derived from methods that differed from those previously used by ADHS Vital Statistics Team. These differences include data collection from the new ADHS Data Lakehouse as part of data modernization efforts at ADHS, updated ICD-10 codes, and the inclusion of additional analyses to expand epidemiologic studies and support programmatic efforts. Given these changes, this report cannot be accurately compared to previously published reports. Where possible, multi-year data has been provided using these new methods to allow comparison and evaluation of trends.

Data Suppression

It is important to note that ADHS suppresses numbers less than six to protect the confidentiality of rare cases and to eliminate bias or potential for error in reporting numbers or rates.

Race/ethnicity categorization

Race/ethnicity groupings are mutually exclusive. For example, individuals identifying as ‘White, Hispanic or Latino’ are classified as ‘Hispanic/Latino.’ Population rates for the ‘Other’ and ‘Unknown’ categories are unavailable due to the lack of an appropriate denominator.

The Arizona Department of Health Services aspires to present data humbly, recognizing numbers never tell the whole story. We strive to work with individuals and communities to learn and share their stories to improve collective understanding. Knowing that people across life circumstances have inequitable opportunities to achieve optimal health, we commit to pair numbers and stories to inform policy and systems change to improve health for all. Efforts in suicide prevention at ADHS such as Suicide Mortality Review and Veteran Suicide Mortality Review compile more comprehensive information to understand these circumstances and identify recommendations for prevention, intervention, and postvention to prevent future deaths due to suicide.

Executive Summary

To understand the patterns, risk factors, locations, and impact of suicide among Arizona's communities, the Arizona Department of Health Services has compiled the best available data for this annual report. It is our hope that this information will provide insight into those most affected and contributing circumstances to guide public health interventions and support those struggling with suicide in the future.

Analysis of Suicide Deaths

Mortality Rates

Arizona suicide fatality rates have been consistently higher than those of the United States (U.S.) as a whole and have increased by 22.2% over the last 10 years. Mortality rates due to suicide have consistently remained higher than those due to motor vehicle crashes (MVC) and homicide. In fact, suicide mortality rates in 2022 (21.5 deaths per 100,000 residents) were higher than the rates of MVC (18.1 deaths per 100,000 residents) and homicide (1.9 deaths per 100,000 residents) combined.

Since 2012, male population-specific mortality rates have consistently been at least three times those of females. While female mortality rates have remained relatively stable over this 10-year period, male rates have steadily increased. The most notable increases over this 10-year period were in the 70 to 79 (72.9% rate increase) and 80+ (40.9% rate increase) age groups. Youth and young adult mortality were analyzed to evaluate differences in rates and trends between five-year age groups. The youth age group with the highest percent increase over this time was young adults ages 20 to 24, with a 37.5% increase and the highest mortality rates among these age groups from 2012-2022. The highest population-adjusted suicide mortality rates from 2017 to 2022 were among those of American Indian/Alaska Native heritage, followed by White and Black/African American groups.

A similar trend of increasing veteran suicide rates has occurred in Arizona and the United States from 2012 to 2022, but the increase in the Arizona rate from 2020 to 2021 has been much steeper (15.5%) compared to the U.S. (3.8%). In addition, Arizona veterans have consistently had a higher rate of suicide than the national veteran suicide rate from 2012 to 2021, which is the year of most recent national data. In Arizona, the steepest increase in veteran compared to non-veteran suicide mortality occurred between 2020 and 2022, where veteran suicide increased by 15.5% from 2020 to 2021 and 12.7% from 2021 to 2022, and non-veteran suicide increased by 7.2% from 2020 to 2021 and 3.8% from 2021 to 2022. As of 2022, male veteran suicide mortality rates were four times greater than those of female veteran rates.

Risk Ratios for Veterans Compared to Non-Veterans

An analysis of the risk for suicide death for veterans compared to non-veterans from 2012 to 2022 showed that across all years, veterans were more than twice as likely to die by suicide compared to non-veterans. Although the ratio of female veteran risk compared to female non-veteran risk was higher than those of male veterans, the confidence intervals were wider, suggesting that the accuracy of this risk estimate and the true value of the risk ratio is not as certain with this population. This is likely due to the smaller number of female veteran deaths by suicide and the smaller female veteran population. Examining risk by age group, the risk was generally higher for veterans compared to non-veterans in the 75-year and up age category, for whom the risk of death by suicide was approximately 7.5 times higher (95% CI 5.21, 10.72) than the risk for non-veterans in that age group in 2016. Analyzed by race and ethnicity, the highest risk ratio was attributed to the Asian/Pacific Islander group, with a 3.98 times higher risk of death by suicide compared to non-veteran Asian/Pacific Islanders (95% CI 2.33, 6.80).

Years Potential Life Lost (YPLL)

Years of potential life lost (YPLL) due to suicide were higher than those of deaths due to motor vehicle crashes or homicide in 2022 (4.1% and 74.3% higher, respectively), even with the heavy burden of suicide in older adult age groups. For veterans, YPLL due to suicide was 89.0% higher than veteran YPLL due to motor vehicle crashes (compared to 4.1% higher for Arizona as a whole in 2022) and 107.6% higher than veteran YPLL due to deaths by homicide (compared to 74.3% higher for Arizona, 2022).

Suicide Methods

The majority (61.1%) of fatal suicides were carried out using firearms in 2022. The frequency of this method was three times higher than the next ranked category, suffocation (20.1%); poisoning was the third most frequently used method (13.4%). Cutting or piercing (1.2%), jumping (1.1%), and drowning (0.5%) were the most infrequent methods. A higher percentage of males died by suicide using firearms (66.3%), whereas higher percentages of females died by suicide using poisoning (29.4%) or suffocation (24.4%) methods. Suicide by firearm was the most frequent method across all groups, especially for older adults. Youth suicide methods differed from those of adults, with 12 and younger using only suffocation methods and older youths using firearms more frequently. Firearms were the most frequent suicide method for all known race and ethnicity groups, except American Indian/Alaska Native (29.6%). For this group, suffocation was the most frequent method of suicide (59.3%). Among veterans, suicide by firearm was much more frequent than any other method in 2022 (82.5%), and the rate of use for this method has increased progressively since 2020.

Among suicides where the cause of death was poisoning and the substance was specified, opioids were the most common (38.0%), followed by antidepressants (23.9%). Opioids were still the most frequently used substance for veterans (34.8%), although less often than by non-veterans (38.6%). Notably, suicide death by alcohol was much more common among veterans than non-veterans (17.4% versus 9.8%), and compared to non-veterans, substances like antidepressants and sedatives for anxiety were used much

less frequently (13.0% and 4.4% compared to 25.5% and 16.9%, respectively) in suicide death by veterans.

Location

Although Maricopa County is home to 61.9% of the Arizona population, it had a lower percentage of the 2022 suicides (49.2%). By contrast, all other counties except for Yuma and Santa Cruz had higher percentages of Arizona suicide deaths compared to their population percentages. Across all counties, there were no striking differences between percentages of male and female suicides. The population-specific rate of suicide deaths in rural counties was almost twice as high (35.6 per 100,000 residents) as the rate of deaths in urban counties (18.6 per 100,000 residents). Higher percentages of suicide deaths in rural areas compared to urban areas were found in the 30 to 39 years, 60 to 69 years, 70 to 79 years, and 80 to 89 years age categories. However, in 10 to 19 years, 40 to 49 years, and 50 to 59 years groups, there was a higher percentage of urban suicide deaths compared to rural suicide deaths in 2022. As with age groups, higher rates of suicide deaths were observed in rural areas compared to urban areas for most racial and ethnic groups, except Black/African American, where the 2022 urban suicide death rate was 12.8% higher than the rural rate.

The five counties with the highest rates of suicide deaths were Greenlee, Gila, La Paz, Mohave, and Apache. Consistent with comparisons of urban versus rural suicide death rates, Pima and Maricopa had lower rates than many of the more rural counties. For veteran suicide deaths by county, Greenlee also had the highest rate, followed by La Paz, Coconino, Yavapai, and Apache counties.

Medical History

From 2012 to 2022, the combined number of hospital visits among suicide decedents increased by 31.2% (from 1,004 to 1,317). However, the total number of hospital visits per decedent in 2012 was 0.87, whereas in 2022, this number was very similar at 0.83 visits per decedent, meaning the number of visits increased proportionally with the number of suicide decedents. For veterans, the average number of hospital visits per decedent in 2012 was 0.72, whereas in 2022, this number was slightly lower at 0.67 visits per decedent (6.9% decrease). Medicare was by far the highest percentage of payment type for veteran decedents (59.8%). Tricare and AHCCCS were similar at 10.1% and 9.6%. Non-veteran payment types were not calculated.

The top five most common principal diagnosis types in all hospital and ED visits for veterans who died by suicide (n=204) in 2022 were mental health (n=24), followed by cardiovascular conditions (n=22), head wounds (n=17), gastrointestinal disorders (n=13), and COVID-19 illness (n=13). Head wounds and certain mental health diagnoses may be due to the suicide event admission itself. In future studies, data modernization efforts at ADHS will allow for a more robust analysis of prior medical history to rule out admission events due to fatal suicide.

Occupations

By occupation, the highest number of female suicide deaths occurred among health care or mental health staff (n=43) in 2022. Among males, the highest number of suicide deaths by occupation was in the construction industry (n=168), which was more than double the number of deaths in the next three highest industries: education (n=68), automotive (n=67), and healthcare and mental health staff (n=61). Of veteran suicide deaths, military (n=31) and government (n=29) were the two most common occupations, although these correspond with past military service and may not reflect the most current employment at the time of death. Following those, construction (n=25) was the most common.

Self-Inflicted Injuries

Hospital and emergency department (ED) visit reports where individuals presented with self-inflicted injuries were compiled from hospital discharge data. However, of these self-inflicted injuries, no determination was made between fatal and non-fatal injuries, and intent could not be determined. There is a difference in the backgrounds, intent, and outcomes between non-suicidal self-injuries (NSSIs), otherwise known as self-injury or self-harm, and suicide attempts.

Hospital and ED visits due to self-inflicted injury decreased from 2016 (n=11,884) to 2022 (n=10,607), a 10.7% decrease. Compared to males, females consistently had higher rates of hospital and ED visits due to self-inflicted injury from 2016 to 2022. This is in contrast to the consistently higher rates of male suicide deaths compared to females since 2016. Youth hospital and ED admission rates due to self-inflicted injury varied by age group, with the highest admission highest among 15 to 19 year olds, followed by 10 to 14 years olds, and 20 to 24 year olds. The rate of hospital and ED visits has declined among all groups except for youth ages 10 to 14. Additional prioritization for surveillance and monitoring is suggested for this group as it has experienced a 31.2% increase in visits due to self-inflicted injury from 2016 to 2022. Among adults, all age groups except for 70 to 79 years of age declined in hospital and ED visits from 2016 to 2022. By race and ethnicity, the American Indian and Alaska Native populations consistently had the highest rate of hospital and ED visits for self-inflicted injury from 2016 to 2022. However, there has been a steady decline in visit rates for this group since 2020. The same decline was observed among the Black and African American population .

ED visit rates for self-inflicted injury have declined overall (21.5% decrease) since 2016, while hospitalizations have only slightly declined (5.1% decrease). Additionally, ED visits declined by 13.1% from 2021 to 2022 alone, while hospitalizations only declined by 1.5% during this time. This trend may be due to a decline in admissions for less serious self-inflicted injuries, but steady rates for those more serious injuries. Costs for self-inflicted injury medical encounters were relatively stable since 2019 except for the spike in 2021 for both hospital and ED visit encounters. Since no spike in the rate of hospital visits for self-inflicted injury was observed in 2021, this cost spike may have been attributed to additional costs associated with COVID-19 precautions during the pandemic (i.e. hazard pay, etc.).

Glossary of Terms

Suicide

Suicide is a death caused by self-directed injurious behavior with any intent to die as a result of the behavior.

Suicide Death

Suicide deaths in Arizona are based on the final determination of the cause of death as reported on the official death certificate. Suicide deaths are likely underreported due to a high threshold of determination of death for suicide compared to accidental death.

Self-Inflicted Injury

Self-inflicted injuries were identified by reported visits to the emergency department or hospital. These visits were determined by ICD-10 code and included both fatal and non-fatal self-inflicted injuries.

Suicidal Ideation

Suicidal ideation refers to thinking about or planning suicide. The thoughts lie on a continuum of severity from a wish to die with no method, plan, intent, or behavior, to active suicidal ideation with a specific plan and intent. Although suicidal ideation does not include physically harmful behaviors, over one third of adolescents who experience suicidal ideation will attempt suicide within their lifetimes.

Risk Factors

Risk factors for suicide refer to personal or environmental characteristics that are associated with suicide. People affected by one or more of these risk factors have a greater probability of suicidal behavior.

Protective Factors

Protective factors are personal or environmental characteristics that reduce the probability of suicide. Protective factors can buffer the effects of risk factors. The capacity to resist the effects of risk factors is known as resilience.

Table of Contents

Executive Summary	4
Analysis of Suicide Deaths	4
Medical History	6
Occupations	7
Self-Inflicted Injuries	7
Glossary of Terms	8
Introduction	10
Methods	10
Data Sources	10
Analytic Methods	11
Findings	12
Analysis of Suicide Deaths	12
Medical History	48
Occupations	54
Self-Inflicted Injuries	55
Limitations	63
Conclusions	64
References	67
Appendix A	68

Introduction

To understand the patterns, risk factors, locations, and impact of suicide, both fatal and non-fatal, among Arizona’s communities, the Arizona Department of Health Services has compiled available hospital discharge and death certificate data in this annual report. It is our hope that this information will provide insight into those most affected and contributing circumstances to guide public health interventions and support those struggling with suicide in the future. The current report provides an update on current trends among suicide deaths and self-inflicted injuries in 2022.

Methods

Suicide deaths are identified from the manner of death as determined by Medical Examiners and cited on death certificates. The methodology for identifying self-injury in hospital discharge data may vary based on agency best practices.

Data Sources

Hospital Discharge Data

ADHS collects [hospital discharge records](#) for emergency department (ED) visits and hospitalizations from all Arizona-licensed hospitals. This collection is required by Arizona Revised Statute (A.R.S.) § 36-125-05, and Arizona Administrative Code Title 9, Chapter 11, Articles 4 and 5. Hospital discharge data includes both fatal and non-fatal encounters. Data were submitted by 144 facilities in Arizona (as of December, 2020).

Death Certificates

Information on suicide deaths is compiled from the original documents filed with the Arizona Department of Health Services Bureau of Vital Records and from transcripts of original death certificates filed in other states but affecting Arizona residents. These data are compiled in the Database Application for Vital Events (D.A.V.E.).

Population Denominators

Where applicable, population denominators have been provided by the Arizona Department of Health Services for Arizona data, by the U.S. Census Bureau (2022, 5-year estimates) for national data, and from the Department of Veteran Affairs for veteran data.

Analytic Methods

Computing Rates

Crude rates were calculated as the number of events (or deaths) occurring among Arizonians per year, divided by the total number of populations for that year. Rates are shown as the number of events/deaths per 100,000 population.

Denominators

The denominators for rates of suicide and self-inflicted injury events and hospital encounters were calculated based on 2022 population data from [ADHS](#). Regional population denominators used to calculate risk ratios were provided by the U.S. Census Bureau (2022, 5-year estimates). Veteran population denominators were provided by the Department of Veteran Affairs for veteran data.

Trend Analyses

Incidence estimates were examined over multiple years (and across groups) to compare current and past trends and provide insight into population differences over time.

Risk Ratios

Risk ratios were calculated using OpenEpi software. Risk for veterans was compared to the reference group. P-values were calculated using Mid-P exact tests. Covariates were not evaluated.

Urban vs. Rural Designation

For this analysis, Maricopa, Pima, and Pinal counties were classified as ‘urban’. All other counties were classified as ‘rural’.

Years of Potential Life Lost

YPLL for this report has been calculated as the sum of years lost to victims of suicide compared to the years that they might have lived based on the average life expectancy for men and women in the United States as of 2022.

Findings

Analysis of Suicide Deaths

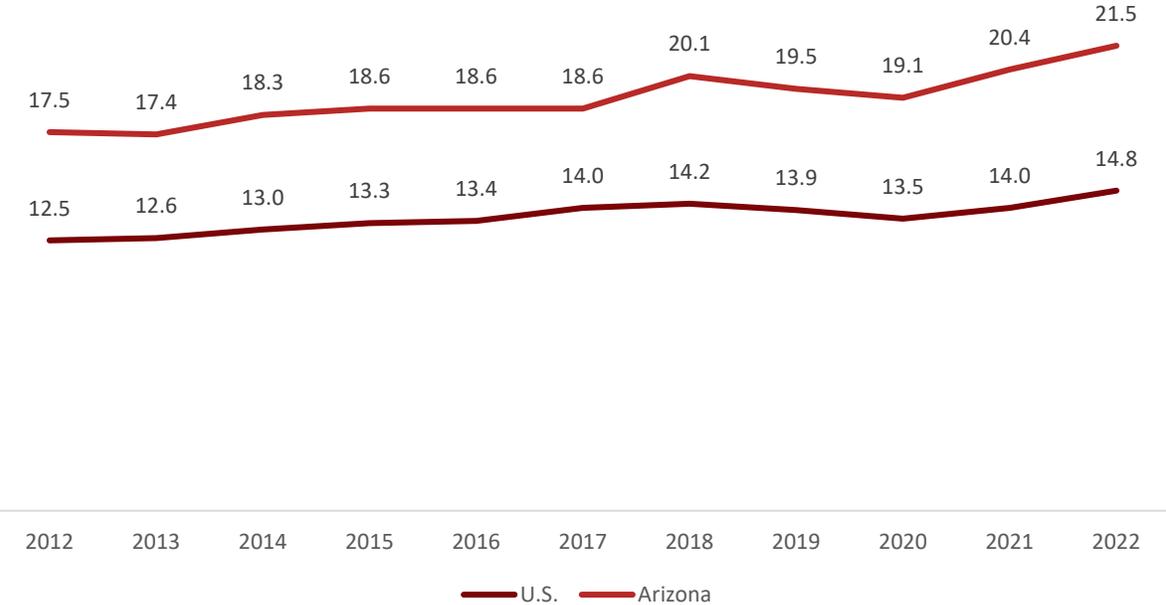
Suicide Mortality Totals and Rates

Arizona Compared to the United States

In the last 10 years, Arizona suicide fatality rates have been consistently higher than those of the United States (U.S.) as a whole. The rate of suicide fatalities in Arizona has increased over the last 10 years, from 17.5 suicide fatalities per 100,000 residents in 2012 to 21.5 suicide fatalities per 100,000 residents in 2022. This reflects a 22.9% increase in the rate of fatal suicides in Arizona in the last 10 years. The percent change in counts is even higher between 2012 (n=1,148) and 2022 (n=1,596) at 39.0%.

Similarly, the suicide fatality rate over the entire U.S. has increased over the last 10 years, from 12.5 per 100,000 residents in 2012 (n=40,600), to 14.8 per 100,000 residents in 2022 (n=49,449). However, this reflects an 18.4% increase in fatal suicide in the U.S., less than that of Arizona by itself.

Figure 1. Suicide rates per 100,000 residents, Arizona and United States, 2012-2022

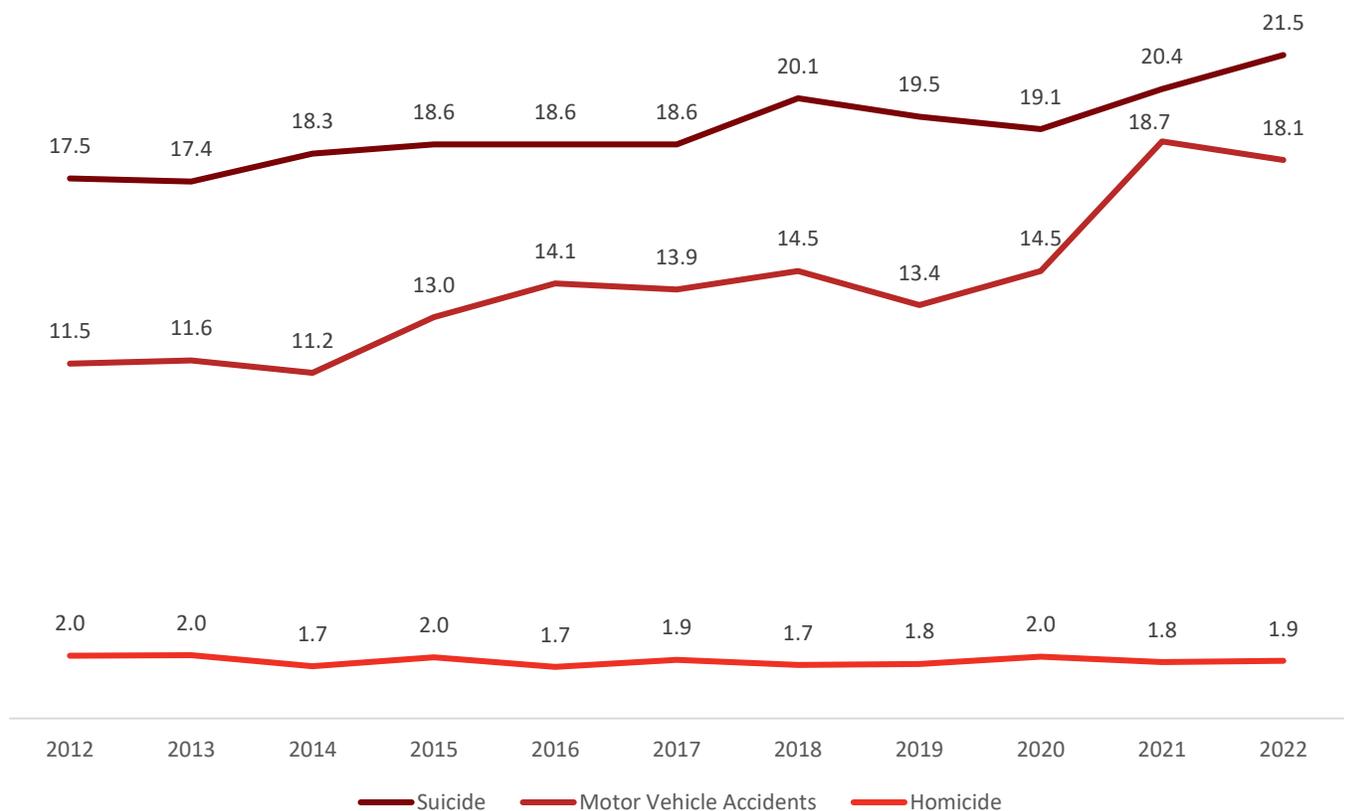


Data Source: Death certificates

Suicide Compared to Motor Vehicle Crashes and Homicide

Mortality rates and counts due to suicide have consistently remained higher than motor vehicle crashes (MVC) and homicide. Comparatively, mortality rates due to MVC and suicide have both increased from 2012 to 2022, while homicide rates have remained relatively stable over this time. In fact, suicide mortality rates in 2022 (21.5 deaths per 100,000 residents) were higher than the rates of MVC (18.1 deaths per 100,000 residents) and homicide (1.9 deaths per 100,000 residents) combined. The same can be said for 2022 counts, with the total number of motor vehicle deaths equaling 1,339, the total number of homicides equaling 138, and the total number of suicides equaling 1,596.

Figure 2. Rates per 100,000 residents for suicide, motor vehicle accidents, and homicide deaths, Arizona 2012-2022

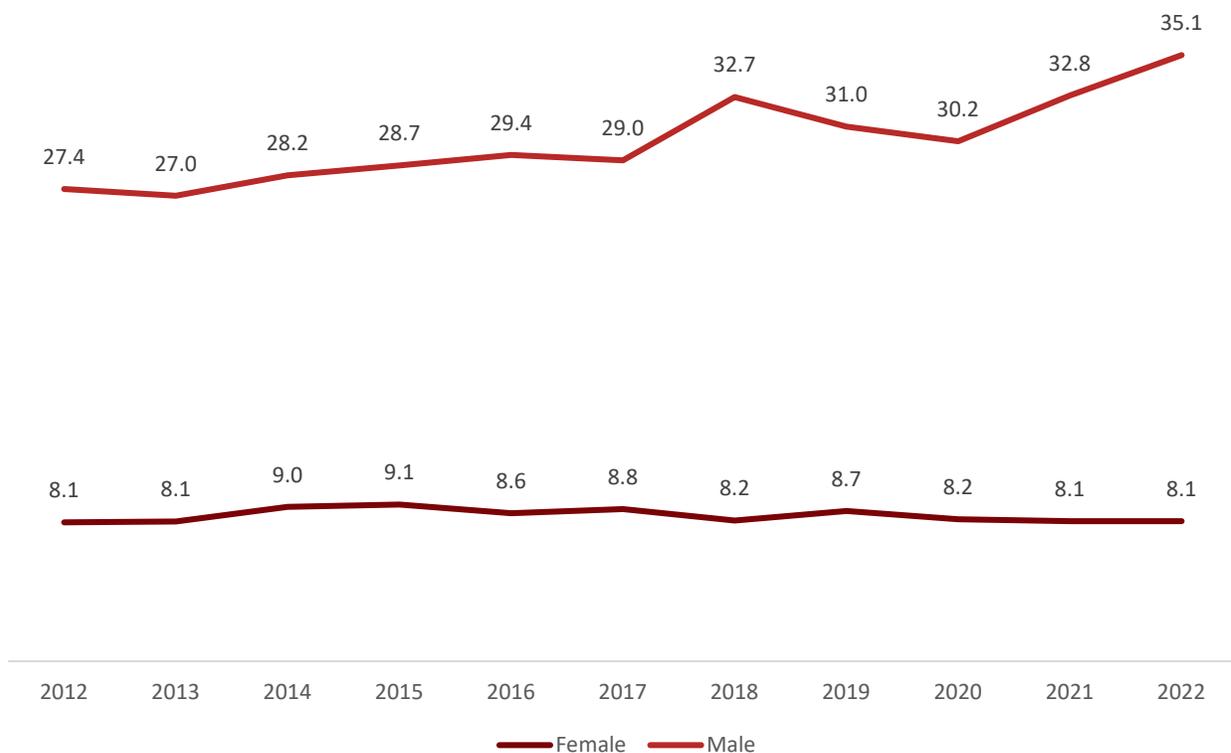


Data Source: Death certificates

Sex

Since 2012, male population-specific mortality rates have consistently been at least 3 times greater than those of females. While female mortality rates have remained relatively stable over this 10-year period, male rates have almost steadily increased. With this disparity, male mortality rates in 2022 (35.1 deaths per 100,000 male residents, n=1,293) were more than four times those of female mortality rates (8.1 deaths per 100,000 female residents, n=303).

Figure 3. Suicide rates per 100,00 residents by sex, Arizona 2012-2022



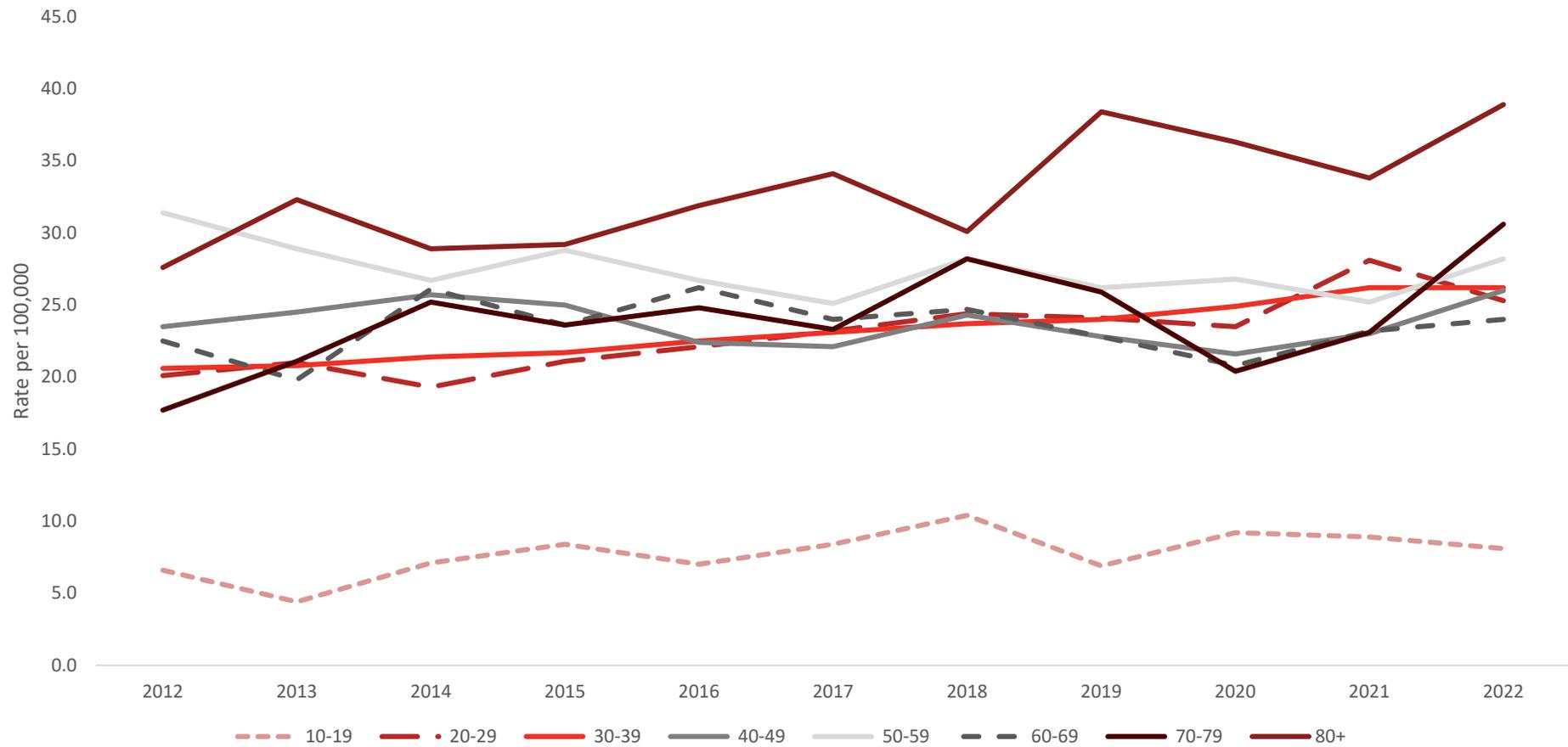
Data Source: Death certificates

Age

Suicide fatality among children ages zero to nine, although especially concerning, has remained rare, with less than 10 deaths total from 2012 to 2022; these counts have been suppressed in Table 1 to protect the confidentiality of these individuals. With the exception of the 0 to 9 and 50 to 59 age groups, all age categories have had an increase in the count and rate of suicide mortalities from 2012 to 2022 (10-19 from 61 to 78, 20-29 from 178 to 262, 30-39 from 173 to 255, 40-49 from 196 to 227, 60-69 from 150 to 206, 70-79

from 71 to 196, and 80+ from 64 to 124). The most notable increases over this 10-year period were in the 70 to 79 (72.9% rate increase) and 80+ (40.9% rate increase) age groups.

Figure 4. Suicide rates per 100,000 residents by age group, Arizona 2012-2022



Data Source: Death certificates

Table 1. Suicide rates per 100,000 residents by age group, Arizona 2012-2022

Year	Age Group								
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
2012	0.0	6.6	20.1	20.6	23.5	31.4	22.5	17.7	27.6
2013	0.0	4.4	21.0	20.8	24.5	28.9	19.8	21.1	32.3
2014	0.0	7.1	19.3	21.4	25.7	26.7	26.1	25.2	28.9
2015	0.0	8.4	21.1	21.7	25.0	28.8	23.6	23.6	29.2
2016	*	7.0	22.1	22.5	22.4	26.7	26.2	24.8	31.9
2017	0.0	8.4	23.2	23.1	22.1	25.1	24.0	23.3	34.1
2018	0.0	10.4	24.4	23.7	24.3	28.2	24.7	28.2	30.1
2019	0.0	6.9	24.1	24.0	22.8	26.2	22.8	25.9	38.4
2020	0.0	9.2	23.5	24.9	21.6	26.8	20.8	20.4	36.3
2021	0.0	8.9	28.1	26.2	23.0	25.2	23.2	23.1	33.8
2022	*	8.1	25.3	26.2	26.0	28.2	24.0	30.6	38.9

Data Source: Death certificates *Note: Rates for the 0-9 age group are suppressed due to low counts

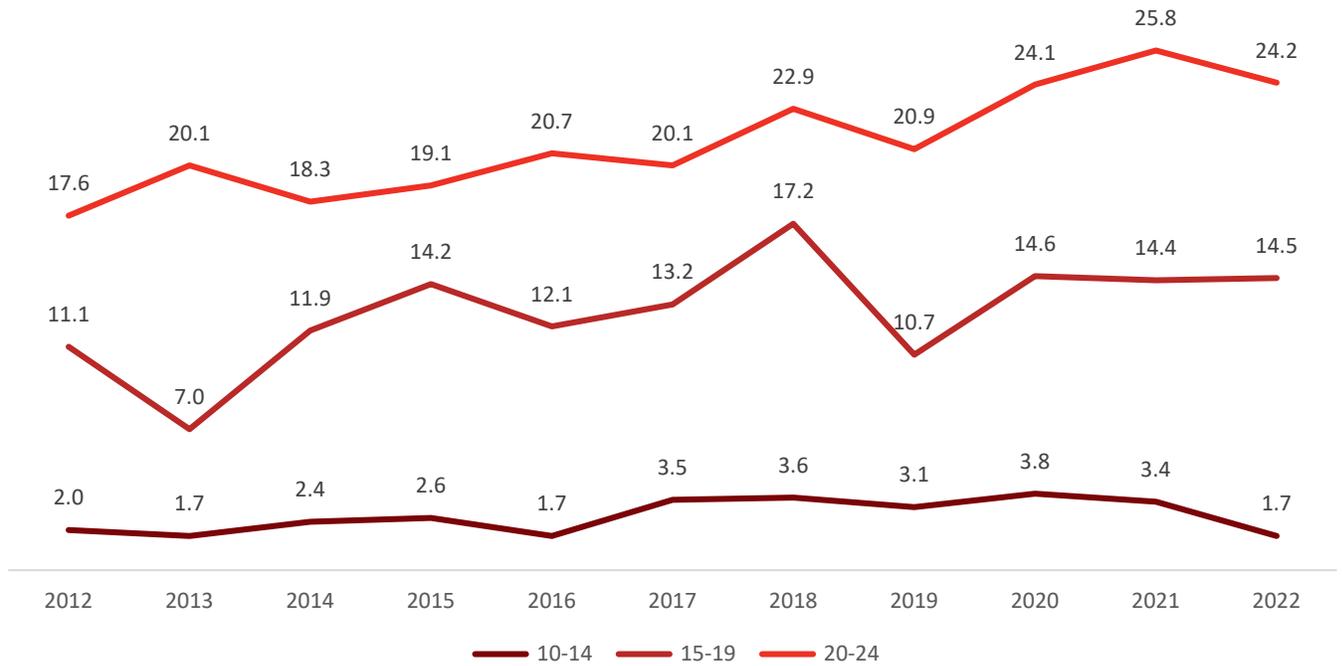
Youth

Youth and young adult suicide mortality were analyzed to evaluate differences in rates and trends between five-year age groups (following age disaggregation standards suggested by Diaz et al¹). Low suicide mortality counts and rates for the 5 to 9 age group have been suppressed in Figure 5 to protect confidentiality; suicide mortality in the 5 to 9 age group has been rare. In the 10 to 14 age group, suicide mortality has been variable from 2012 to 2022, with rates increasing in general from 2014 to 2020 (n= 9 and 18), but declining suddenly in 2016 and 2022 (n= 8 and 8).

Although variable from year to year, mortality counts and rates for 15 to 19 and 20 to 24 age groups have increased overall from 2012 (11.1 deaths per 100,000 residents, n=52, and 17.6 deaths per 100,000 residents, n=80) to 2022 (14.5 deaths per 100,000 residents, n=70, and 24.2 deaths per 100,000 residents, n=122). The age group with the highest percent increase over

this time was young adults ages 20 to 24, with a 37.5% increase. This age group also had the highest mortality rates among these age groups each year.

Figure 5. Suicide rates per 100,000 residents for youth, Arizona 2012-2022



Data Source: Death certificates *Note: 0-9 age group has been suppressed due to low counts

Race and Ethnicity

The highest population-specific suicide mortality rates from 2017 to 2022 were for American Indian/Alaska Native, followed by White and Black/African American groups. Asian/Pacific Islander and Hispanic/Latino groups remained lowest across all six years, representing less than half the rate of White race and ethnicity, and less than one-third the rate of American Indian/Alaska Native. All race and ethnicity identities have, generally, had an increase in suicide mortality rates over this five year time period, although American Indian/Alaska Native had a significant decrease from 2021 to 2022 and Asian/Pacific Islander had a slight decrease from 2021 to 2022. Breaking this down further, both American Indian/Alaska Native and Asian/Pacific Islander groups experienced a spike in suicide mortality in 2021, where both groups had comparatively lower suicide mortality rates in 2019 and 2020. Looking further back, a similar spike in suicide mortality rates was observed in 2018 for American Indian/Alaska Native and Black/African American groups.

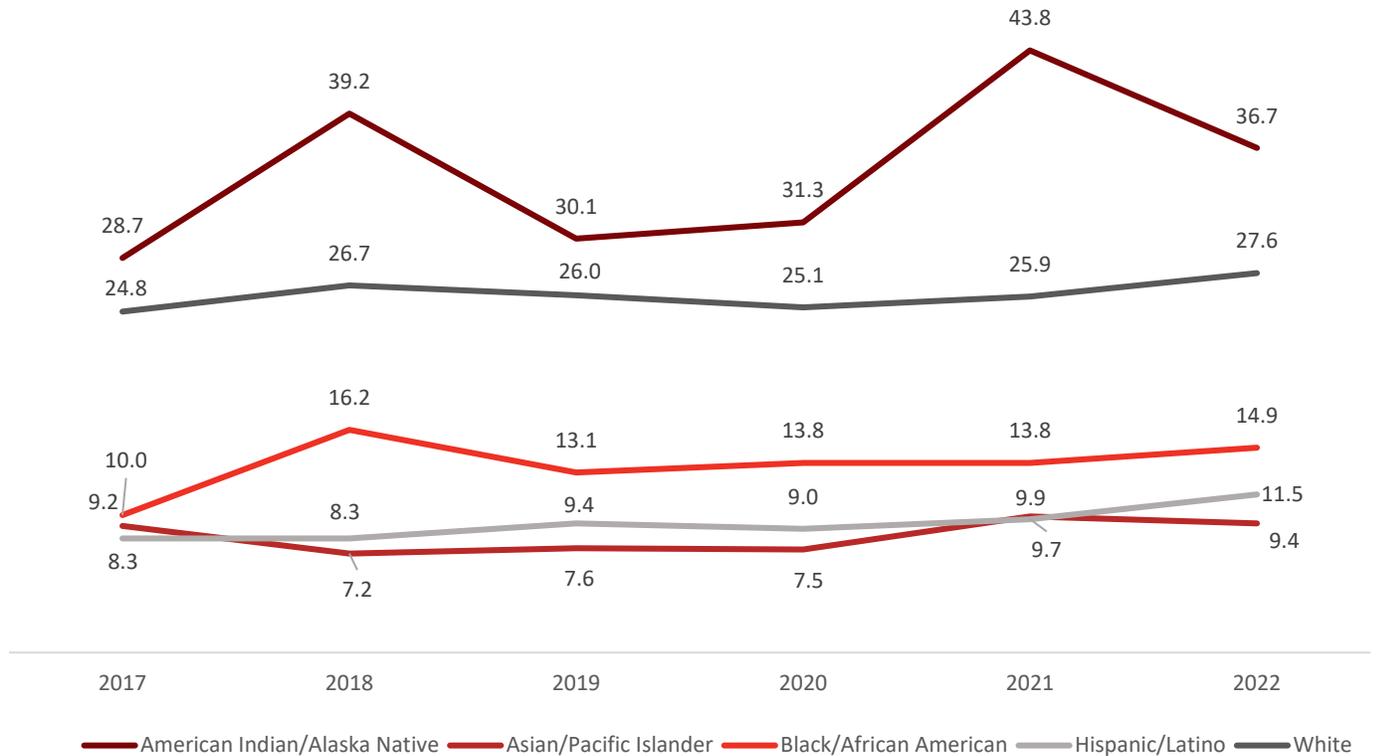
Additional data analysis of persons in participating National Violent Death Reporting System (NVDRS) jurisdictions during 2015–2020 identified many risk factors for the American Indian/Alaska Native population. This analysis found higher risks of suicide among American Indian/Alaska Native persons across a range of factors, such as relationship problems related to intimate partners, family, and other relationships; interpersonal violence victimization and perpetration; and death of friends or family members by suicide. Similarly, more alcohol and other substance use circumstances, including those of an acute and more chronic nature, were observed, as were criminal problems, although the nature of these problems was unknown. Any representation of risk factors among AI/AN populations must consider the context and consequences of current inequities as well as historical trauma, including intergenerational transmission, that continue to affect AI/AN persons, families, and communities today. Suicide is a multi-faceted problem with many contributing factors that affect different communities differently².

Table 2. Percent of population vs. percent burden of suicide by race/ethnicity, Arizona 2022

Race/Ethnicity	% of Population	% Burden of Suicide
American Indian/Alaska Native	4.0	6.8
Asian/Pacific Islander	4.0	1.8
Black/African American	5.2	3.6
Hispanic/Latino	31.9	17.0
White	55.0	70.4
Unknown	N/A	0.5

Data Source: Death certificates

Figure 6. Suicide rates per 100,000 residents by race/ethnicity, Arizona 2017-2022

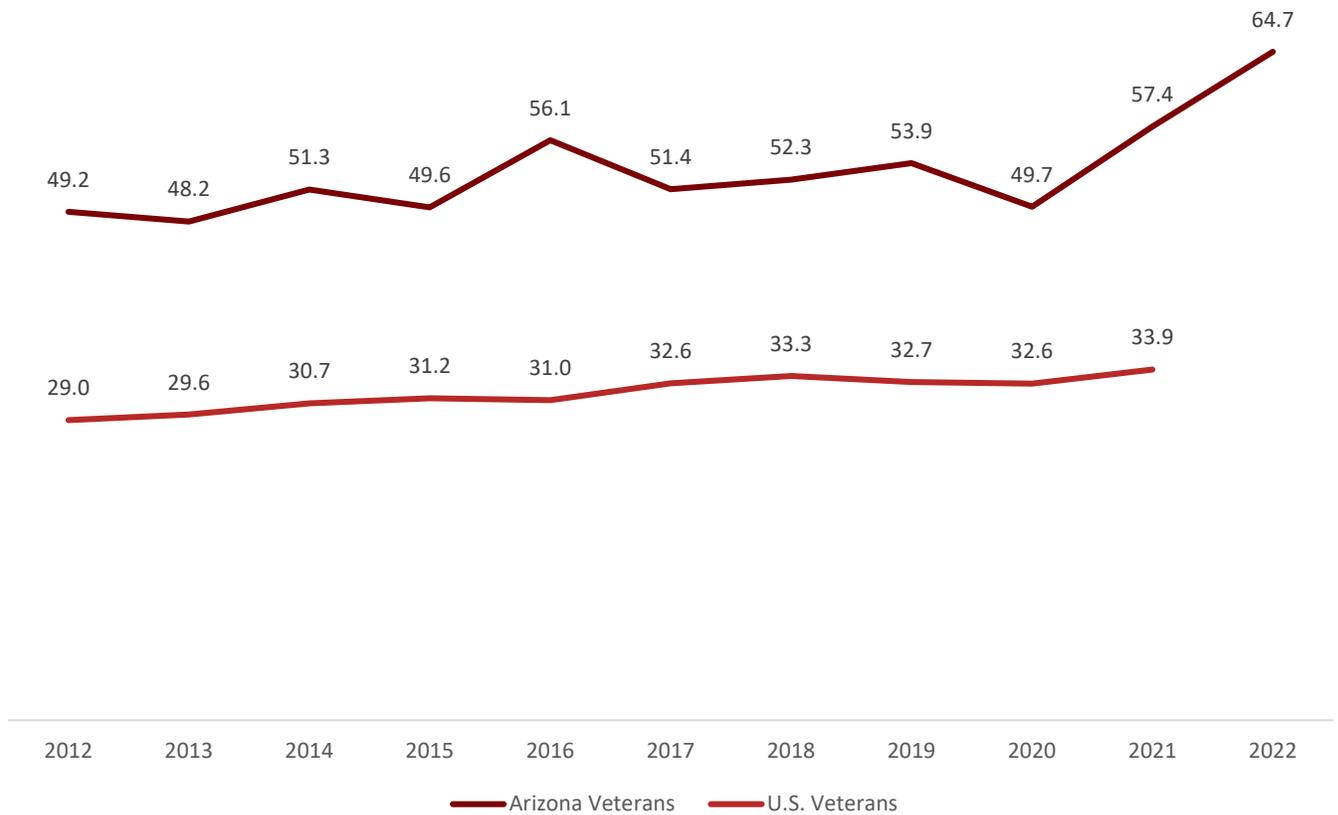


Data Source: Death certificates

Veterans Compared to National Data Reported by the U.S. Department of Veteran Affairs

The rate of suicide deaths for Arizona veterans has been consistently higher than that of U.S. veterans as a whole from 2012 to 2021, the most recent data year available for the U.S.A similar trend of increasing veteran suicide rates has occurred in both Arizona and the United States from 2012 to 2022, but the increase in the Arizona rate from 2020 to 2021 has been much steeper (15.5%) compared to the U.S. (3.8%).

Figure 7. Suicide rates per 100,000 veteran residents, Arizona and the U.S. 2012-2022

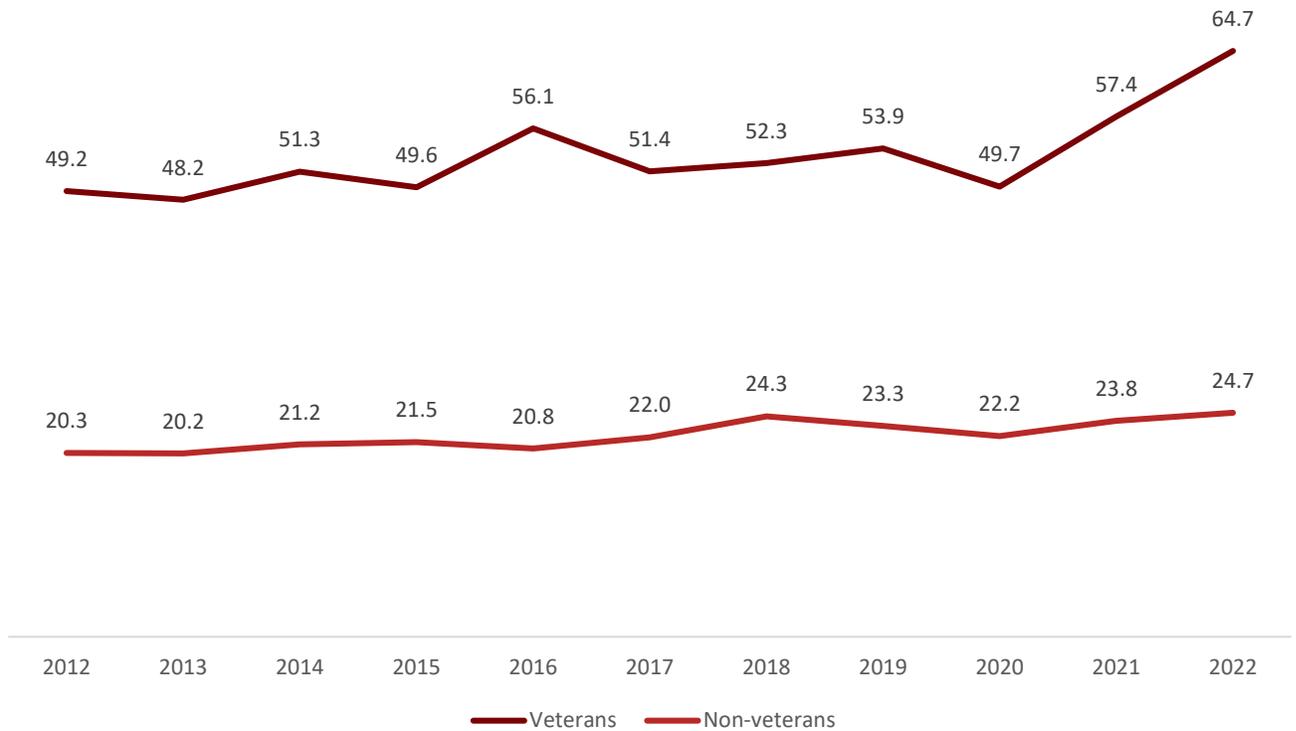


Data Source: Death Certificates and the Department of Veterans Affairs³ *2022 U.S. veteran rate was not available at the time of this report

Veterans

Suicide mortality rates have been consistently higher for veterans compared to non-veterans from 2012 to 2022. Across all years, veterans experienced more than double the population-specific rate of suicide mortality compared to non-veterans. The steepest increase in veteran compared to non-veteran suicide mortality occurred between 2020 and 2022; veteran suicide increased by 15.5% from 2020 to 2021 and 12.7% from 2021 to 2022, while non-veteran suicide increased by 7.2% from 2020 to 2021 and 3.8% from 2021 to 2022. Since the COVID-19 pandemic began in the United States in 2020⁴, this stark increase may be attributed to the trauma and aftermath of the pandemic, but cannot be determined through these data.

Figure 8. Suicide rates per 100,000 for veterans and non-veterans, Arizona 2012-2022

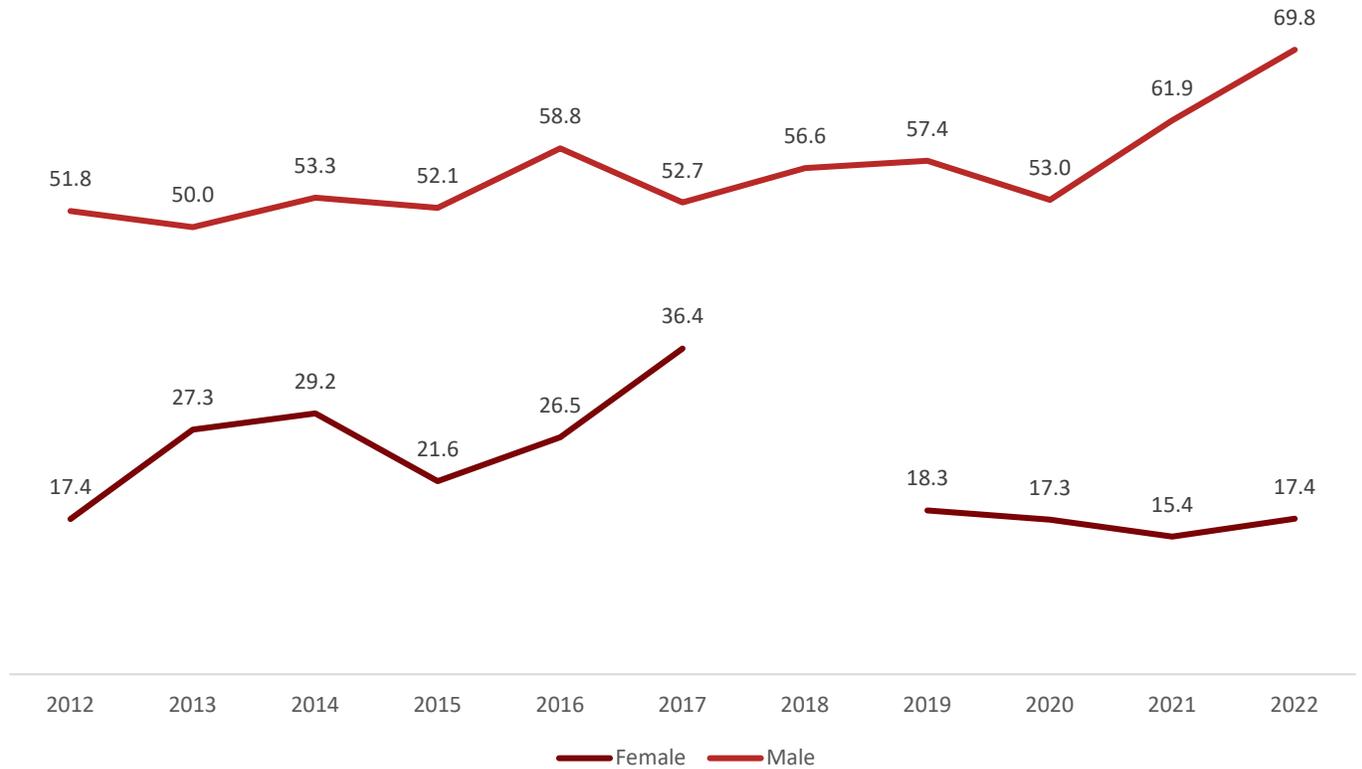


Data Source: Death certificates

Veterans by Sex

Suicide mortality rates for veterans adjusted by female and male veteran populations show that male suicide mortality rates have been consistently higher than female rates from 2012 to 2022. Male veteran suicide rates have had a steep increase since 2020 as observed in the general veteran population trends, while female rates have stayed relatively consistent from 2020 to 2022. While prior to 2020, male veteran suicide rates were fairly consistent with a small spike observed in 2016, female rates have been more variable across this 10-year period, with a spike followed by a significant decline in 2017 and 2018, then stabilization from 2019 onward. As of 2022, male veteran suicide mortality rates were 4 times those of female veteran rates.

Figure 9. Suicide rates per 100,000 veteran residents by sex, Arizona 2012-2022



Data Source: Death certificates *Note: 2018 female rate is suppressed due to count <6

Introduction to Risk Ratio

Risk ratios are a measure of association that compares the risk for a disease or outcome for one population compared to another. ADHS is required to report risk ratios for veteran populations according to A.R.S. §36-146. For veteran suicide, these measures help public health professionals and organizations understand the risk, or probability, of suicide for veterans and specific veteran groups compared to that of non-veterans and non-veteran groups. A risk ratio of 1.00 for veterans compared to non-veterans would indicate that the risk of veteran suicide was equal to the risk of non-veteran suicide. A risk ratio above 1.00 and a 95% confidence interval (CI) that does not include 1.00 would indicate a statistically significant increase in risk for suicide for veterans compared to non-veterans. The further away from 1.00, the greater the difference in risk. A negative risk ratio, although not present in the findings of this report, would indicate that the veteran group had a decreased risk compared to non-veterans.

Risk by Veteran Status

Across all years from 2012 to 2022, veterans were more than twice as likely to die by suicide compared to non-veterans. This estimate is provided by the risk ratio, here demonstrating the ratio of the probability of a veteran dying by suicide versus the probability of a non-veteran dying by suicide. For the most recent data year in this report, 2022, this risk ratio was 2.62 (95% CI 2.31, 2.96), which was the second highest risk ratio since 2012, with the highest at 2.70 (95% CI 2.36, 3.08) in 2016 and the lowest at 2.15 (95% CI 1.88, 2.46) in 2018. Lower risk ratios reflect the risk of death by suicide being more similar for veterans and non-veteran individuals. Risk ratios and probability statistic measures were statistically significant across all years.

Table 3. Veteran risk ratios by veteran status, Arizona 2012-2022

Year	Group	Risk Ratio	95% CI
2012	Veteran	2.42	2.11, 2.78
2013	Veteran	2.38	2.07, 2.74
2014	Veteran	2.42	2.11, 2.77
2015	Veteran	2.31	2.01, 2.65
2016	Veteran	2.70	2.36, 3.08
2017	Veteran	2.33	2.03, 2.68
2018	Veteran	2.15	1.88, 2.46
2019	Veteran	2.32	2.03, 2.65
2020	Veteran	2.24	1.95, 2.57
2021	Veteran	2.41	2.11, 2.75
2022	Veteran	2.62	2.31, 2.96

Data Source: Death certificates *Veterans were compared to non-veterans **Bold indicates statistical significance

Risk by Veteran Status and Sex

In general, from 2012 to 2022, male veterans had a statistically significant higher risk of death by suicide than male non-veterans with risk ratios ranging from 1.67 (95% CI 1.45, 1.92) to

1.99 (95% CI 1.72, 2.30), except for 2017, in which veteran status seemed to be a protective factor yielding a lower risk of suicide than non-veteran status risk ratio of 0.181 (95% CI 0.16, 0.21). This difference may be attributed to an outlier in the number of veteran compared to non-veteran deaths. Female veteran risk ratios from 2012 to 2022 were not statistically significant for 7 out of the 11 years from 2012 to 2022. This indicates that no difference in risk for female veterans compared to female non-veterans was detected, although this may be because the number of female veteran suicide deaths and/or the overall female veteran population was too small for the statistical tests to detect a difference. The risks for female veterans were statistically significant in 2013, 2014, 2016, and 2017. Of these years, the risk ratios ranged from 2.56 (95% CI 1.44, 4.55) to 3.33 (95% CI 1.98, 5.60). Although these risk ratios of female veteran risk compared to female non-veteran risk were higher than those of male veterans, the confidence intervals were wider, suggesting that the accuracy of this risk estimate and the true value of the risk ratio is not as certain with this population, likely due to the smaller number of female veteran deaths by suicide and female veteran population.

Table 4. Veteran risk ratios by veteran status and sex, Arizona 2012-2022

Year	Group	RR	95% CI	Group	RR	95% CI
2012	Female	1.68	0.79, 3.56	Male	1.99	1.72, 2.30
2013	Female	2.65	1.45, 4.85	Male	1.92	1.65, 2.22
2014	Female	2.56	1.44, 4.55	Male	1.98	1.71, 2.29
2015	Female	1.88	0.97, 3.65	Male	1.90	1.64, 2.20
2016	Female	2.57	1.41, 4.69	Male	2.14	1.86, 2.46
2017	Female	3.33	1.98, 5.60	Male	0.18	0.16, 0.21
2018	Female	0.67	0.22, 2.10	Male	1.67	1.45, 1.92
2019	Female	1.67	0.83, 3.36	Male	1.81	1.57, 2.08
2020	Female	1.70	0.84, 3.43	Male	1.74	1.50, 2.01
2021	Female	1.49	0.70, 3.15	Male	1.85	1.61, 2.12
2022	Female	1.68	0.83, 3.39	Male	1.99	1.74, 2.26

Data Source: Death certificates *Veteran females were compared with non-veteran females, veteran males were compared with non-veteran males **Bold indicates statistical significance

Risk by Veteran Status and Age

Across all age categories, veterans had a statistically significant higher risk of death by suicide compared to non-veterans. The risk was generally higher for veterans compared to non-veterans in the 75-year and up age category, in which risk ratios ranged from 4.17 (95% CI 3.16, 5.50) in 2022 to 7.47 (95% CI 5.21, 10.72) in 2016. This reflects a risk of death by suicide for veterans 75 years of age and older, which was approximately 7.5 times higher than the risk of non-veterans in that age group in 2016. The average risk ratio from 2012 to 2022 for this group was 5.40. The next highest risk group by risk ratio was 18 to 34 years, with an average risk ratio of 3.61, followed by 64 to 74 years, with an average risk ratio of 3.26 from 2012 to 2022. These age groups reflect the most vulnerable age groups of veterans at risk for death by suicide. The group with the lowest risk of death by suicide for veterans compared to non-veterans was 55 to 64 years, with an average risk ratio of 2.05. As a note, the risk estimates attributed to these age groups may continue to change over time, as the domestic and foreign war experiences and support available to veterans have changed over time with each generation. **(Table 12 in Appendix)**

Risk by Veteran Status and Race/Ethnicity

Data years were aggregated for 2017 to 2022 to estimate risk ratios by veteran status and race or ethnicity to account for the small annual number of deaths for certain race or ethnicity groups. The highest risk ratio was attributed to the Asian/Pacific Islander group, with a 3.98 times higher risk of death by suicide compared to non-veteran Asian/Pacific Islanders (95% CI 2.33, 6.80). The confidence interval for the risk estimate for this group was wider than others due to the comparatively smaller count of suicide deaths across these years, but the lowest estimate of that risk was higher than the risk ratio of the next highest risk race and ethnicity group, White (risk ratio 2.51, 95% CI 2.36, 2.66). Hispanic/Latino was the next highest risk group with a risk ratio of 2.18 (95% CI 1.79, 2.66), followed by Black/African American with a risk ratio of 1.56 (95% 1.11, 2.18) compared to non-veteran groups of the same race and ethnicity identity. The risk ratio for American Indian/Alaskan Native (AI/AN) was the lowest and did not show a statistically significant difference between veterans and non-veterans. This finding may reflect that there is no true difference in risk or it may be due to the comparatively smaller number of veteran and/or non-veteran deaths by suicide for this group which affects the ability of the statistical tests to detect a difference.

Table 5. Veteran risk ratios by veteran status and race/ethnicity, Arizona 2012-2022

Race/Ethnicity	RR	95% CI
American Indian/Alaska Native	0.92	0.611, 1.38
Asian/Pacific Islander	3.98	2.33, 6.80
Black/African American	1.56	1.11, 2.18
Hispanic	2.18	1.79, 2.66
White	2.51	2.36, 2.66

Data Source: Death certificates*Veterans of each race/ethnicity were compared with non-veterans of each race/ethnicity
**Bold indicates statistical significance

Years Potential Life Lost (YPLL)

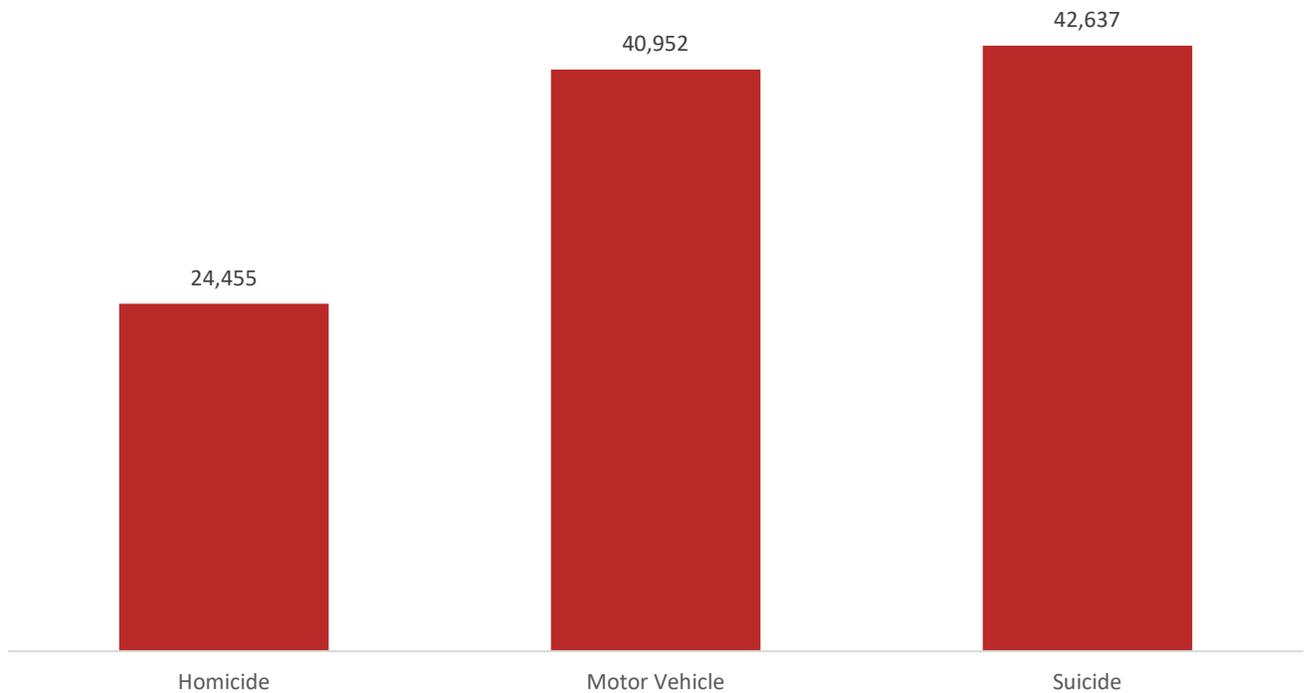
Introduction

Years of potential life lost (YPLL) is a measure that helps conceptualize the social and economic consequences of premature death. Calculations of YPLL can vary⁵. YPLL for this report has been calculated as the sum of years lost to victims of suicide compared to the years that they might have lived based on the average life expectancy in the United States as of 2022: 80.2 years for women and 74.8 years for men⁶. Although this measure can help to understand the burden of public health issues and prioritize public health interventions, it does place heavier weight on diseases and injuries affecting younger age groups⁷. It is also challenging to compare complex public health issues such as suicide, which involves both behavioral health and injury, to injury and violence or chronic disease processes. YPLL due to suicide death has been compared to two other injury and violence public health concerns in this report, homicide and motor vehicle crashes.

YPLL for Arizona

YPLL due to suicide were 4.1% higher than those of deaths due to motor vehicle crashes and 74.3% higher than those due to homicide in 2022, even with the heavy burden of suicide in older adult age groups.

Figure 10. Years of potential life lost (YPLL) due to homicide, motor vehicle crashes, and suicide, Arizona 2022

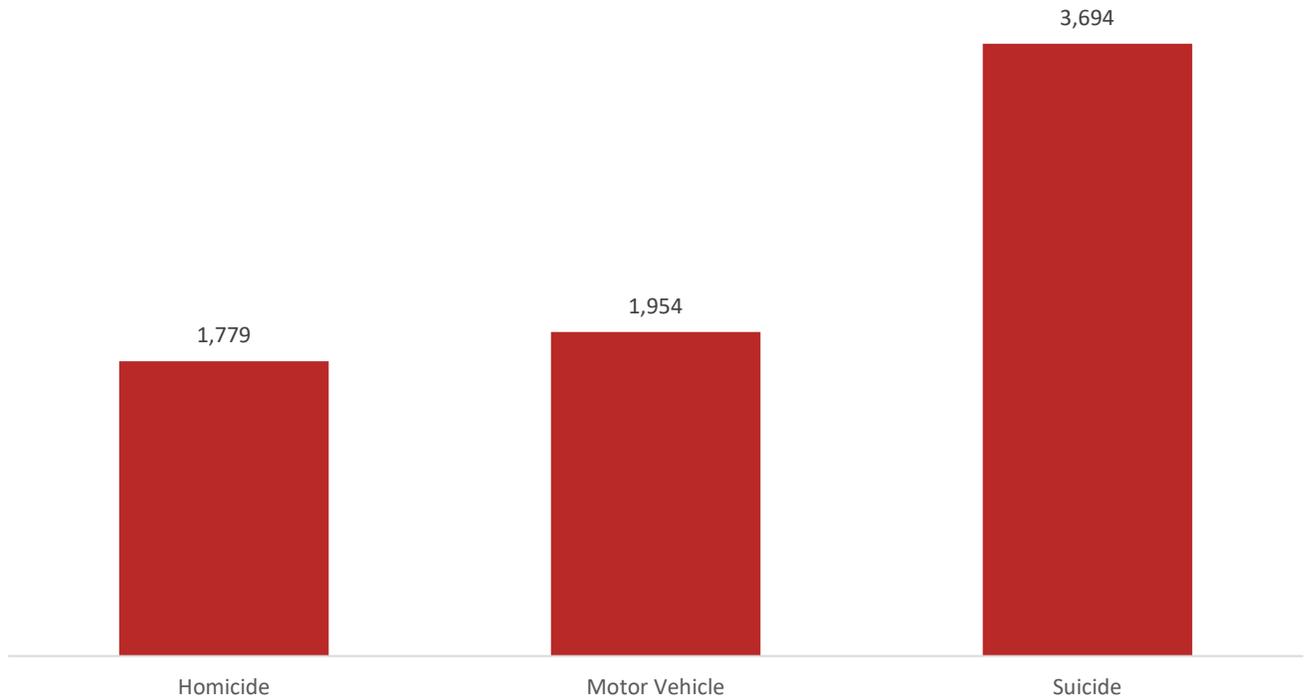


Data Source: Death certificates *Note: YPLL was calculated using female and male life expectancy estimates from the CDC for 2022⁸

YPLL by Veteran Status

YPLL due to suicide deaths for veterans were significantly higher than motor vehicle crashes and homicides compared to veterans and non-veterans as a whole. For veterans, YPLL due to suicide was 89.0% higher than veteran YPLL due to motor vehicle crashes (compared to 4.1% higher for Arizona as a whole in 2022) and 107.6% higher than veteran YPLL due to deaths by homicide (compared to 74.3% higher for Arizona, 2022).

Figure 11. Years of potential life lost (YPLL) due to homicide, motor vehicle, and suicide for veterans, Arizona 2022)



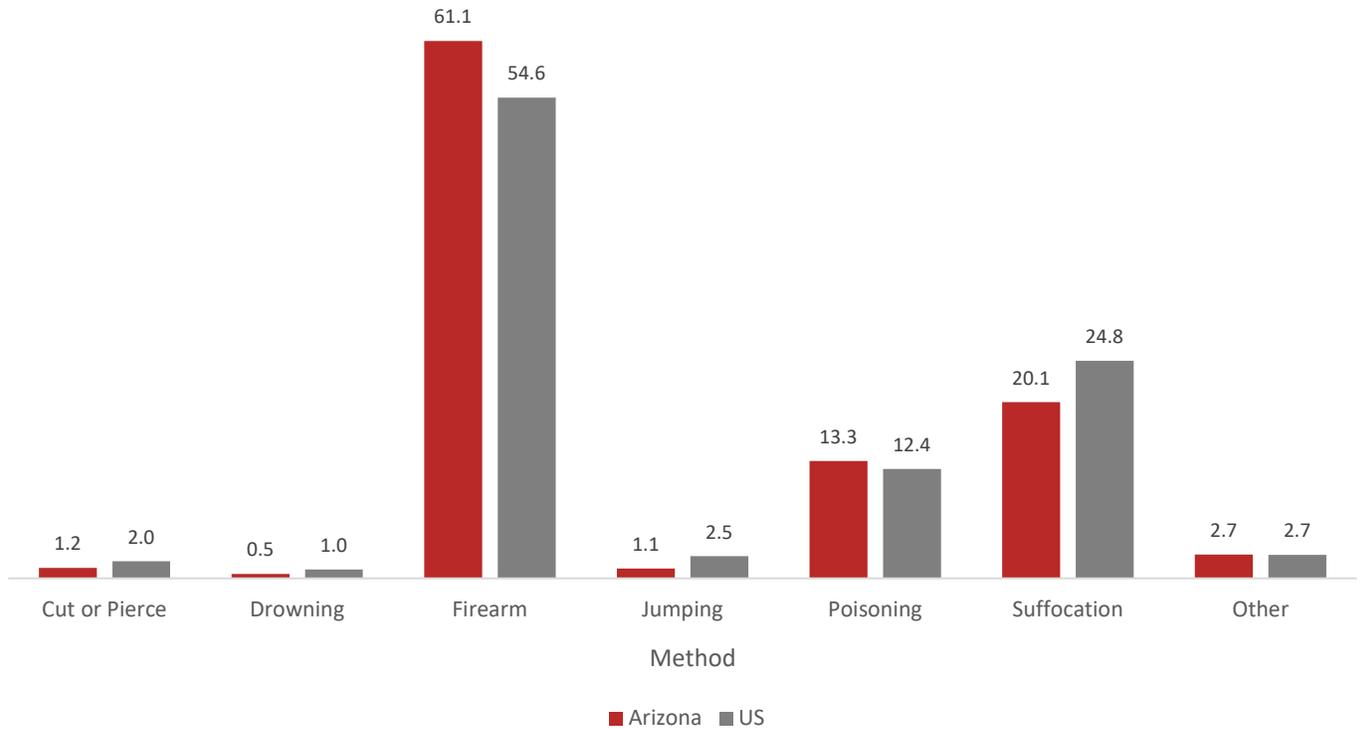
Data Source: Death certificates *Note: YPLL was calculated using female and male life expectancy estimates from the CDC for 2022⁸

Suicide Death Method Totals and Percentages

Arizona

The majority (61.1%, n=975) of fatal suicides were carried out using firearms in 2022. This method was three times higher than the next most frequent category, suffocation (20.1%, n=320), which was followed by poisoning (13.3%, n=213). Suicide by cutting or piercing (1.2%, n=19), jumping (1.1%, n=18), and drowning (0.5%, n=8) were the most infrequent. Compared to the U.S. as a whole, Arizona had higher percentages of suicide deaths by firearm and poisoning, but less by suffocation, cutting or piercing, jumping, and drowning.

Figure 12. Percentage of suicides by method, Arizona and the U.S. 2022

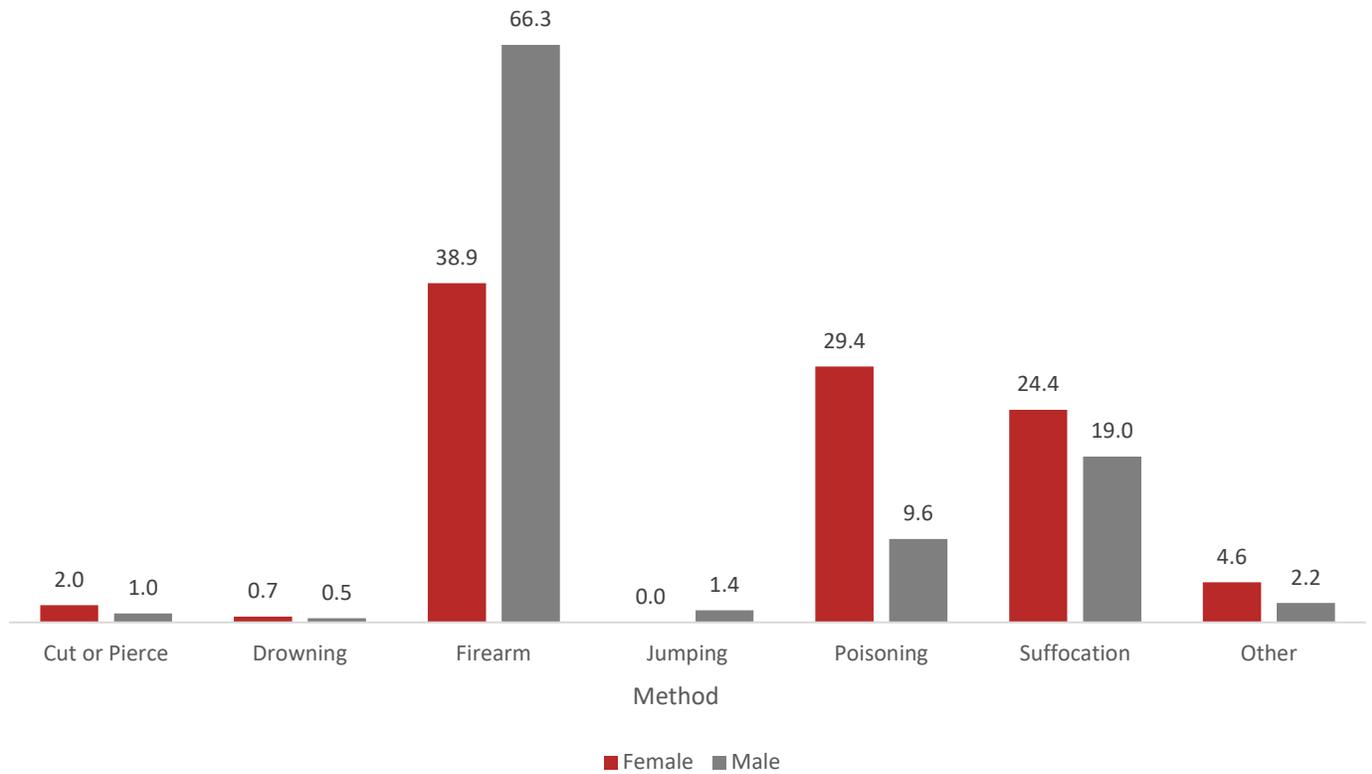


Data Source: Death certificates and CDC WONDER⁹

Sex

Methods of death by suicide differed between females and males in 2022. A higher percentage of males died by suicide using firearms (66.3% males, 38.9% females), whereas higher percentages of females died by suicide using poisoning (29.4% females, 9.6% males) or suffocation methods (24.4% females, 19.0% males).

Figure 13. Percentage of male and female suicides by method, Arizona 2022 (n=1,596)

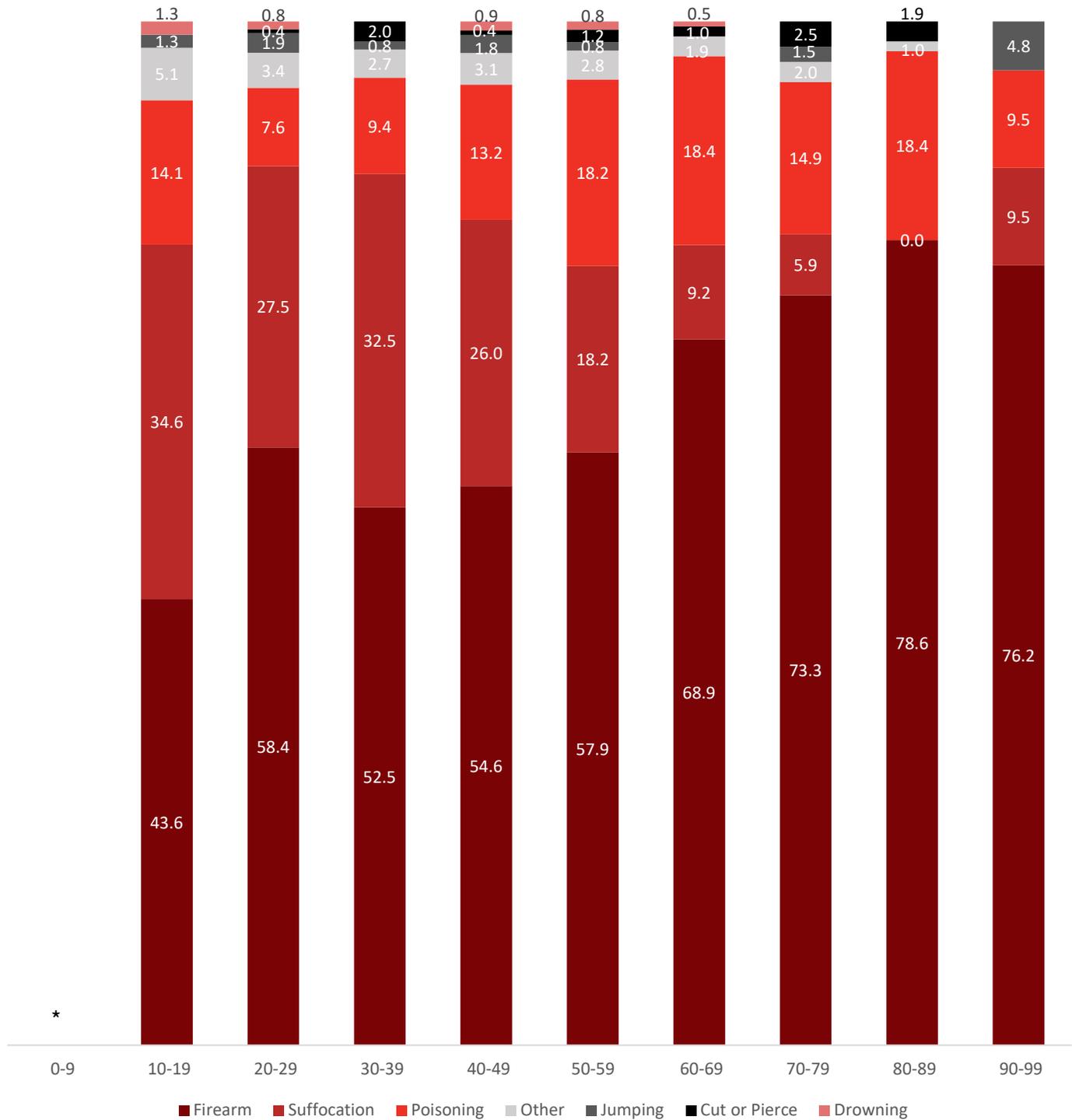


Data Source: Death certificates

Age

Suicide methods varied somewhat between age groups. Suicide by firearm was the most frequent method across all groups, especially for older adults for whom firearms represented 68.9% of fatality methods for adults ages 60-69, 73.3% for adults ages 70-79, 78.6% for adults ages 80-89, and 75.8% for adults ages 90-99. Suicide by suffocation was most frequent among adults ages 20-29 (27.4%), 30-39 (32.5%), 40-49 (26.0%), and 50-59 (18.2%). Suicide by poisoning was most frequent among adults ages 50-59 (18.2%) and 60-69 (18.4%) compared to other age groups.

Figure 14. Percentage of age group suicides by method, Arizona 2022 (n=1,596)

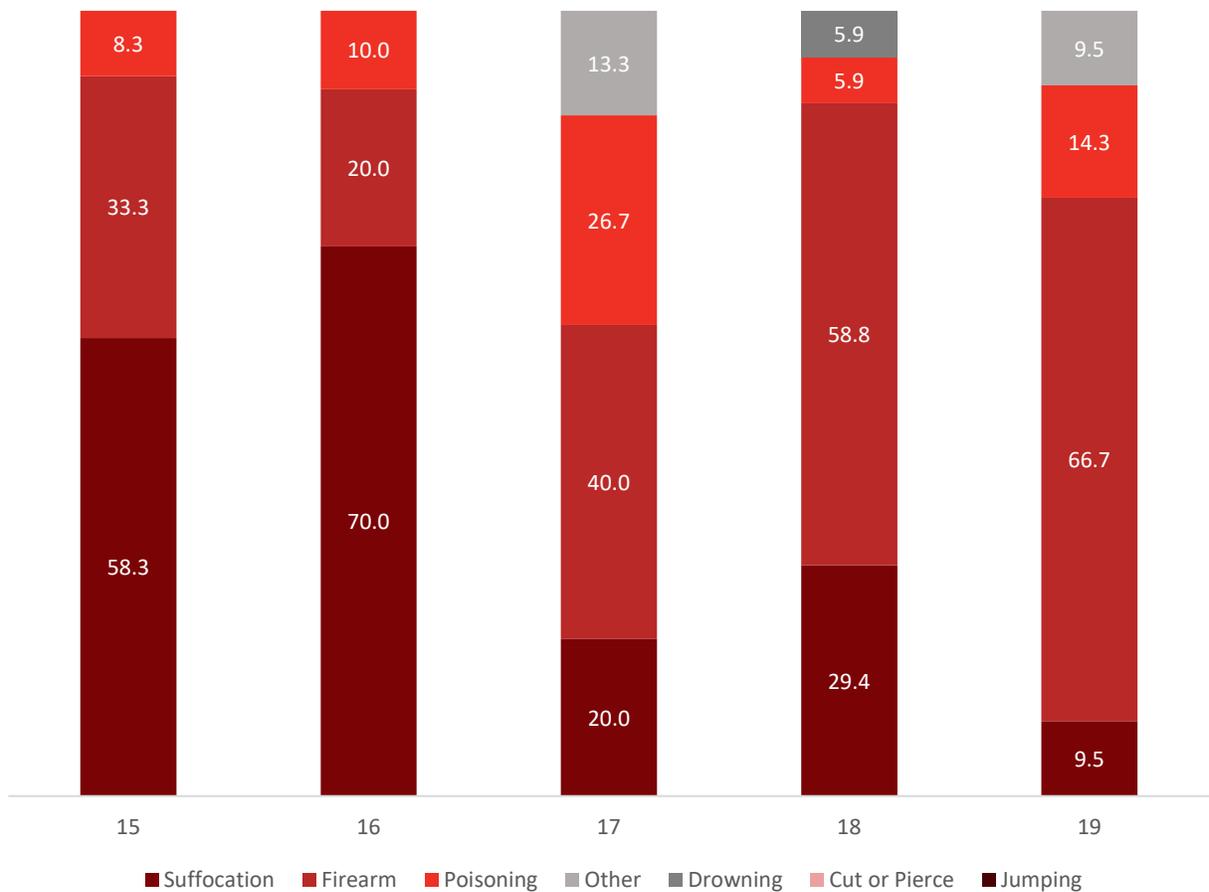


Data Source: Death certificates *Note: Percentages for the 0-9 age group have been suppressed due to low counts

Youth

Youth suicide methods differed from those of adults. Youths aged 12 and younger only used suffocation, whereas youths ages 13 to 19 used a mix of methods, primarily firearms, suffocation, and poisoning. Jumping or cutting/piercing methods were not seen in youth suicides in 2022. Older youth aged 17 to 19 more frequently used firearms to perform suicide than younger ages, and jumping was more frequently observed in those 17-19 years.

Figure 15. Percentage of youth suicides of ages 15-19 by method, Arizona 2022 (n=70)



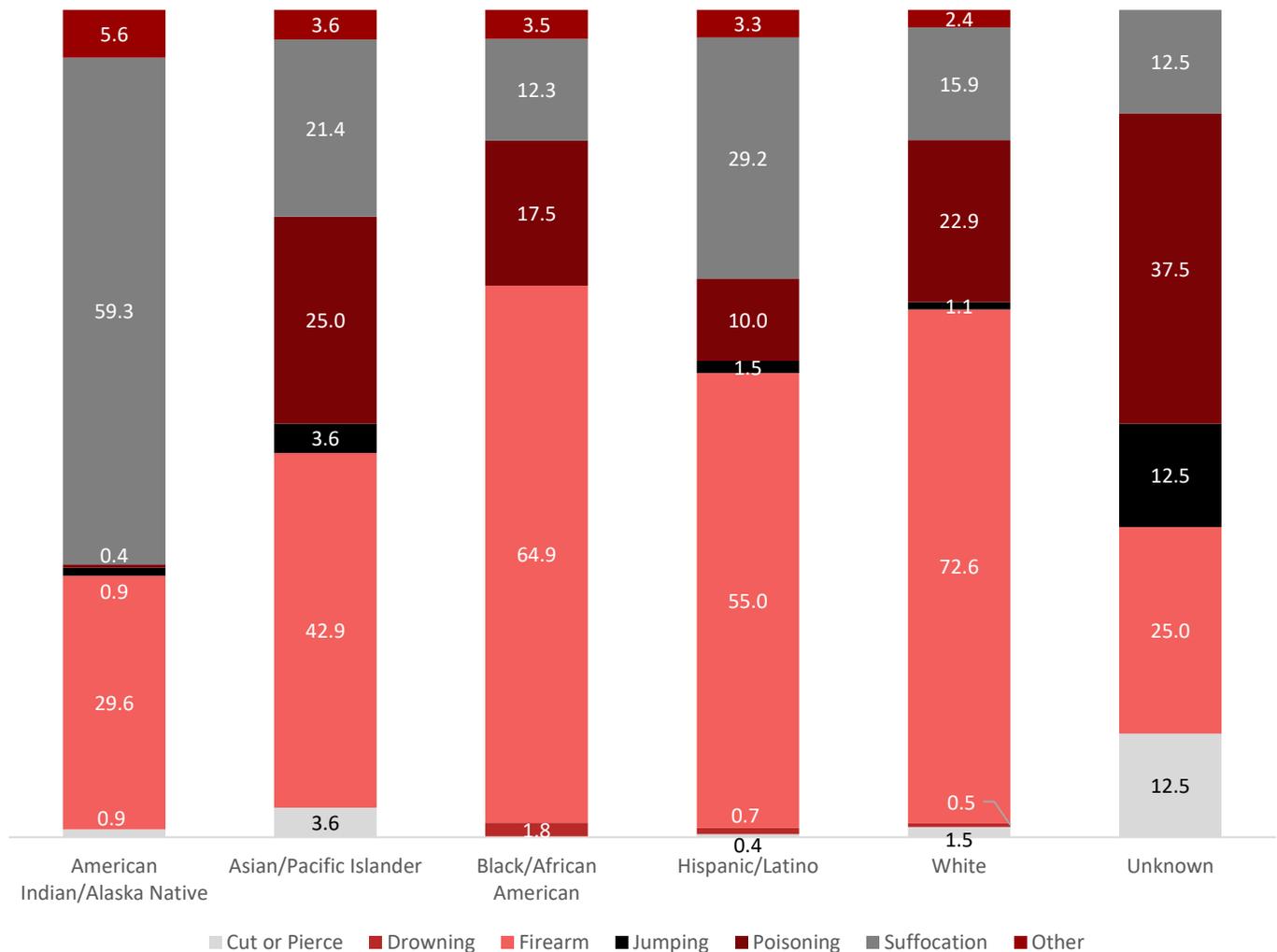
Data Source: Death certificates *Note: Percentages for ages 9, 10, 12, 13, and 14 have been suppressed due to low counts

Race and Ethnicity

Firearm was the most frequent suicide method for all known race and ethnicity groups, with the exception of American Indian/Alaska Native. For this group, suffocation was the most

frequent method of suicide (59.3%). Suffocation was more common in American Indian/Alaska Native, Hispanic/Latino (29.2%), and Asian/Pacific Islander (21.4%) groups compared to White (15.9%) and Black/African American (12.3%) groups. Suicide by poisoning was more common in Asian/Pacific Island (25.0%) and White (22.9%) groups compared to Black/African American (17.5%), Hispanic/Latino (10.0%), and American Indian/Alaska Native (0.4%). Suicide by jumping and cutting or piercing was very infrequent across all known groups, but most common in Asian/Pacific Islander (3.6% for both methods).

Figure 16. Percentage of suicides for each race/ethnicity by method, Arizona 2022 (n=1,596)

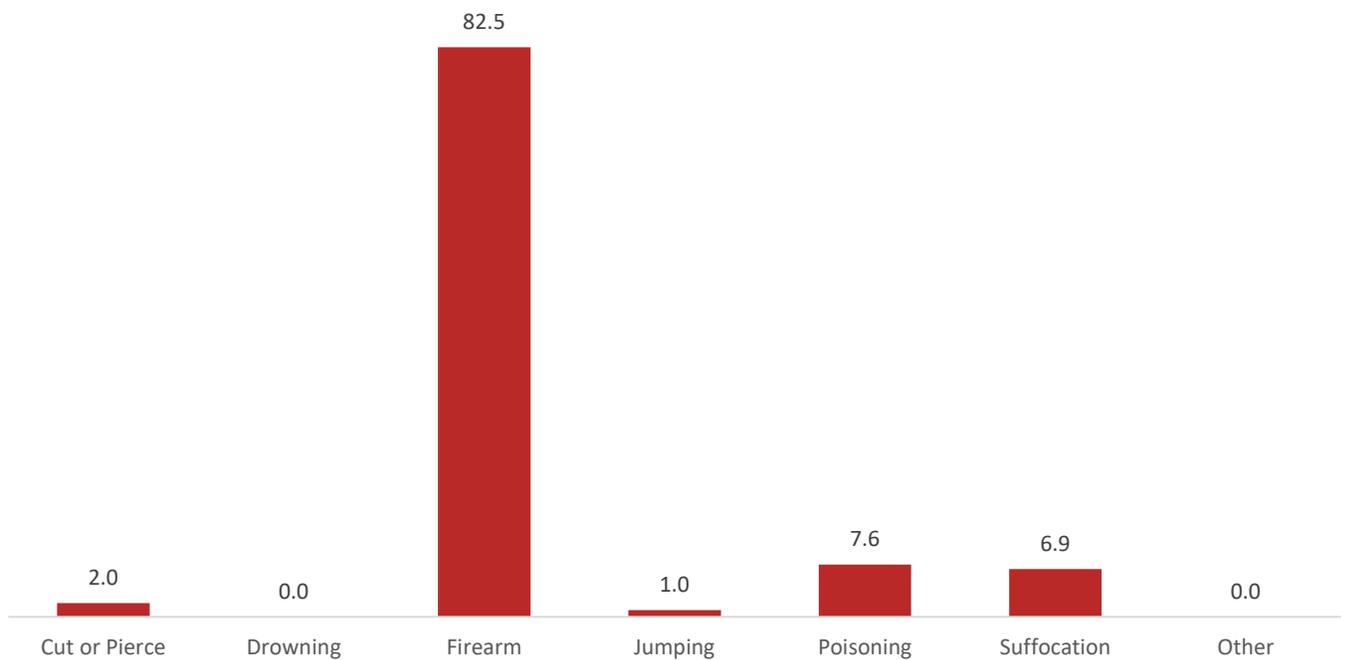


Data Source: Death certificates

Veterans

Among veterans, suicide by firearm was much more frequent than any other method in 2022 (82.5%). Veteran suicide by firearm was more than ten times more common than any other method including poisoning (7.6%), suffocation (6.9%), cutting or piercing (2.0%), and jumping (1.0%).

Figure 17. Percentage of veteran suicide deaths by method, Arizona 2022 (n=303)

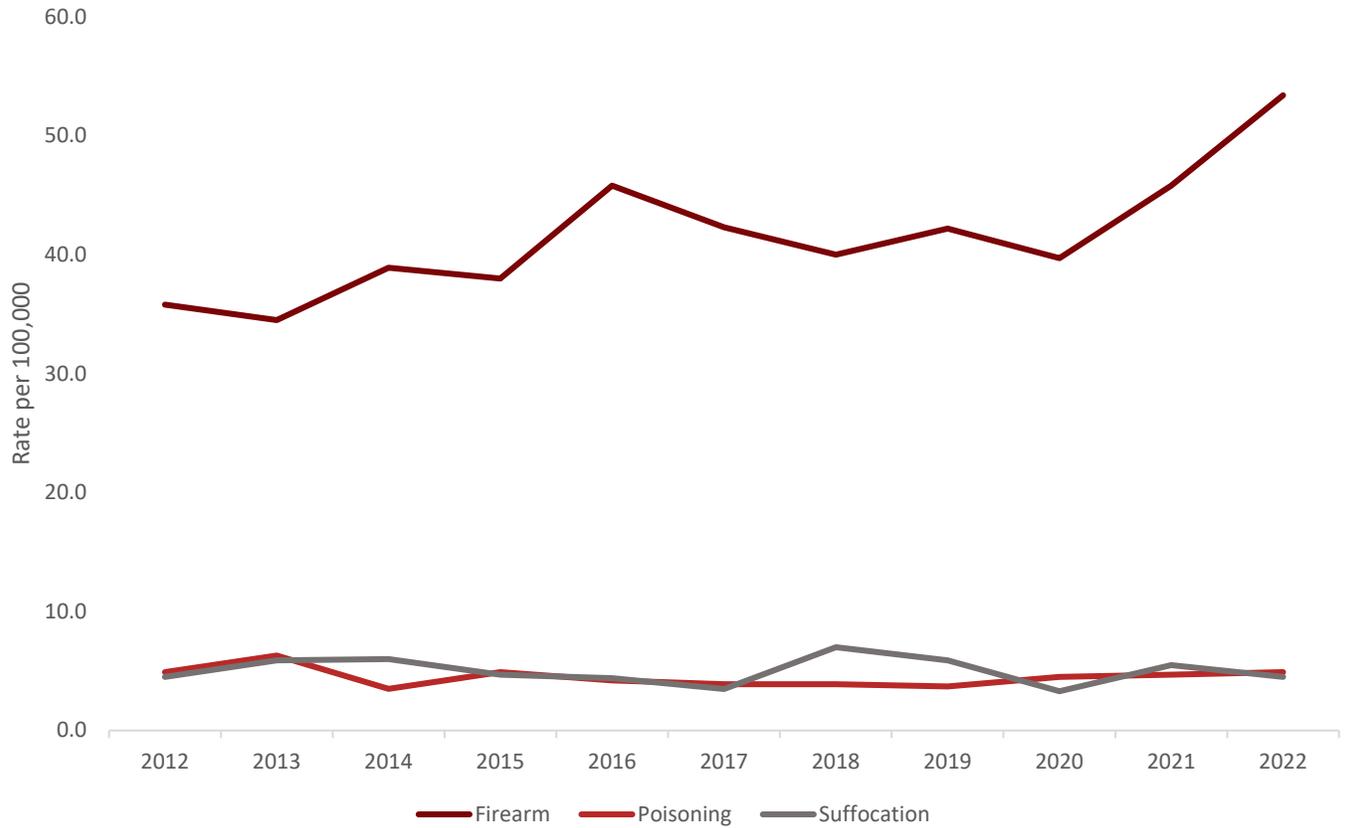


Data Source: Death certificates

Veterans, 10-Year Trend

Although suicide by firearms has been consistently and significantly more frequent than any other method in the 10-year span between 2012 and 2022, the rate of this method use has increased progressively since 2020, from 39.7 per 100,000 in 2020 to 53.4 per 100,000 in 2022.

Figure 18. Rate of veteran suicide death per 100,000 residents by method, Arizona 2012-2022



Data Source: Death certificates *Note: Rates for jumping, drowning, cut or pierce, and other were comparatively low.

Table 6. Rate of veteran suicide death per 100,000 residents by method, Arizona 2012-2022

Year	Method						
	Cut or Pierce	Drowning	Firearm	Jumping	Poisoning	Suffocation	Other
2012	*	0.0	35.8	0.0	4.9	4.5	3.4
2013	*	*	34.5	*	6.3	5.9	*
2014	1.2	*	38.9	*	3.5	6.0	1.2
2015	*	*	38.0	0.0	4.9	4.7	*
2016	*	0.0	45.8	0.0	4.2	4.4	1.2
2017	*	*	42.3	0.0	3.9	3.5	*
2018	*	*	40.0	*	3.9	7.0	*
2019	1.2	0.0	42.2	*	3.7	5.9	*
2020	*	*	39.7	*	4.5	3.3	1.2
2021	*	*	45.8	0.0	4.7	5.5	*
2022	1.3	1.3	53.4	*	4.9	4.5	*

Data Source: Death certificates *Note: Rates for some methods were suppressed due to small counts

Substance Related Suicides Totals and Percentages

Introduction

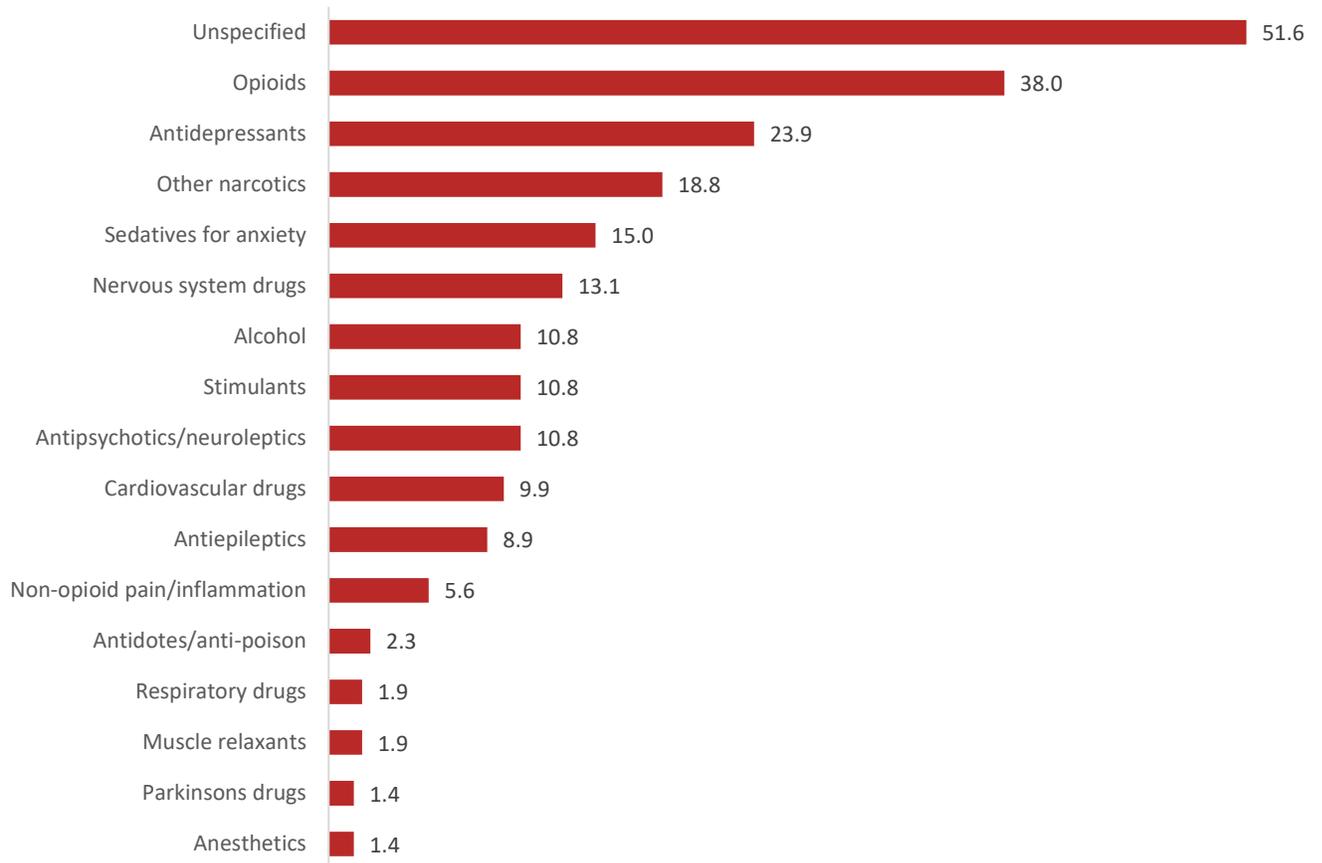
In this report, the terms “substance use” and “substance method” describe the substances responsible for death in fatal suicides. This information comes from the ICD-10 codes listed as the cause of death on the individual’s death certificate.

Arizona

For causes of death by substance use where the contributing substances were specified, opioids were the most common (38.0%), followed by antidepressants (23.9%), other narcotics (18.8%), sedatives used for anxiety (15.0%), and other nervous system drugs (13.1%). Antipsychotics and neuroleptic drugs, stimulants, and alcohol each accounted for 10.8%, while classes such as cardiovascular drugs (9.9%), antiepileptics (8.9%), non-opioid

medications for pain or inflammation such as Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) and acetaminophen (5.6%), antidotes (2.3%), respiratory medications (1.9%), muscle relaxants (1.9%), medications for Parkinson’s-type symptoms (1.4%), and anesthetics (1.4%) all reflected less than 10% of substance types used. It is important to keep in mind that taking too much of anything can be toxic to the body, even if it is thought of as a generally safe medication.

Figure 19. Percentage of overdose suicides with listed drugs, Arizona 2022 (n=213)



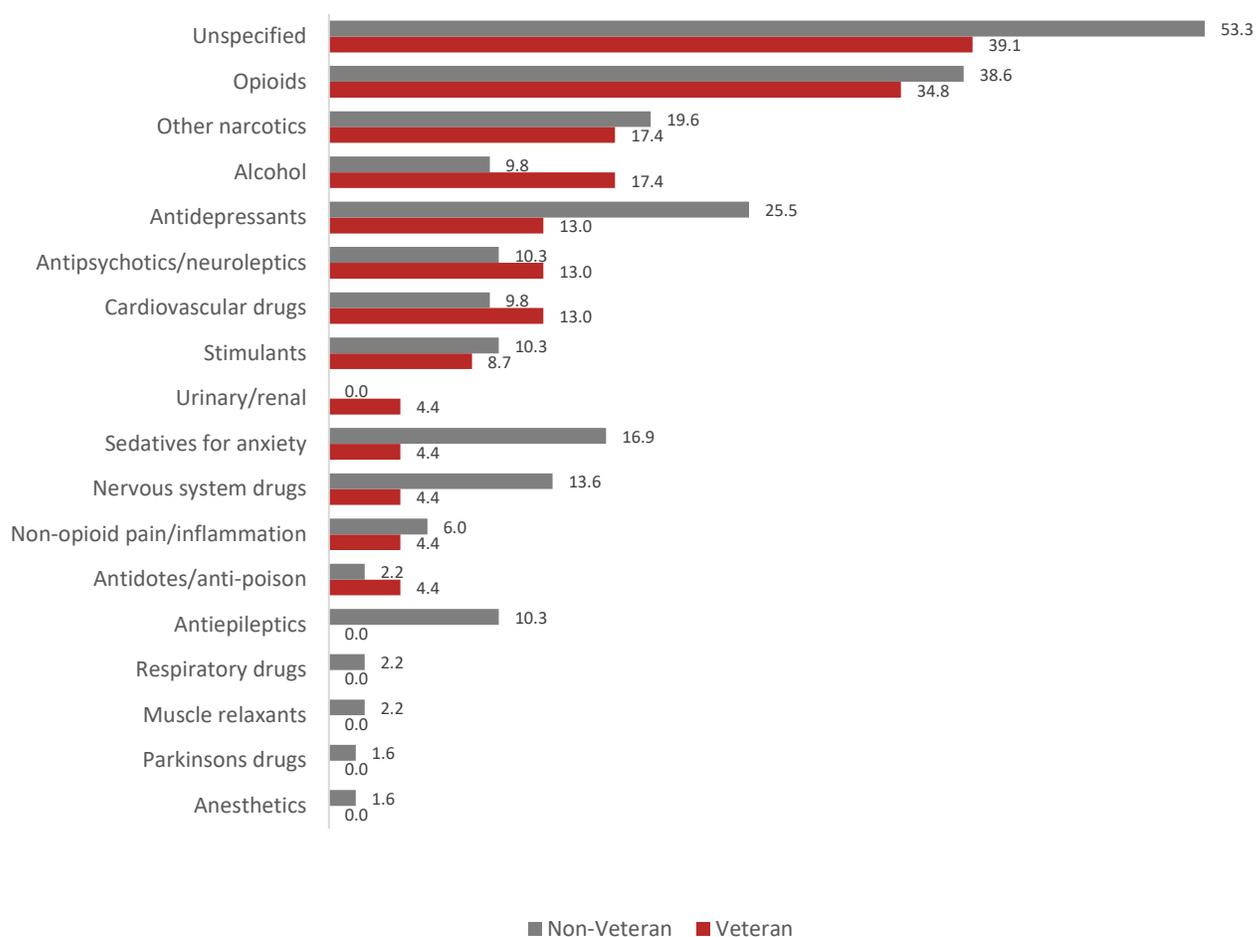
Data Source: Death certificates using ICD-10 codes

Veterans

Substance use categories that were not methods of suicide death for veterans or cases for which veteran status was unknown were not included. Of those drug categories that were specified in the death certificate cause of death, opioids were still the most frequently used substance for veterans (34.8%), although less often than non-veterans, followed by other

narcotics (17.4%), alcohol (17.4%), antidepressants (13.0%), antipsychotics and neuroleptics (13.0%), and cardiovascular medications (13.0%). The most notable differences among those substances used more frequently for suicide was that suicide death by alcohol was much more common for veterans compared to non-veterans (17.4% versus 9.8%), and that compared to non-veterans, substances like antidepressants and sedatives for anxiety were used much less frequently (13.0% and 4.4% compared to 25.5% and 16.9%, respectively) in suicide death by veterans.

Figure 20. Percentage of overdose suicides with listed drugs by veteran status, Arizona 2022



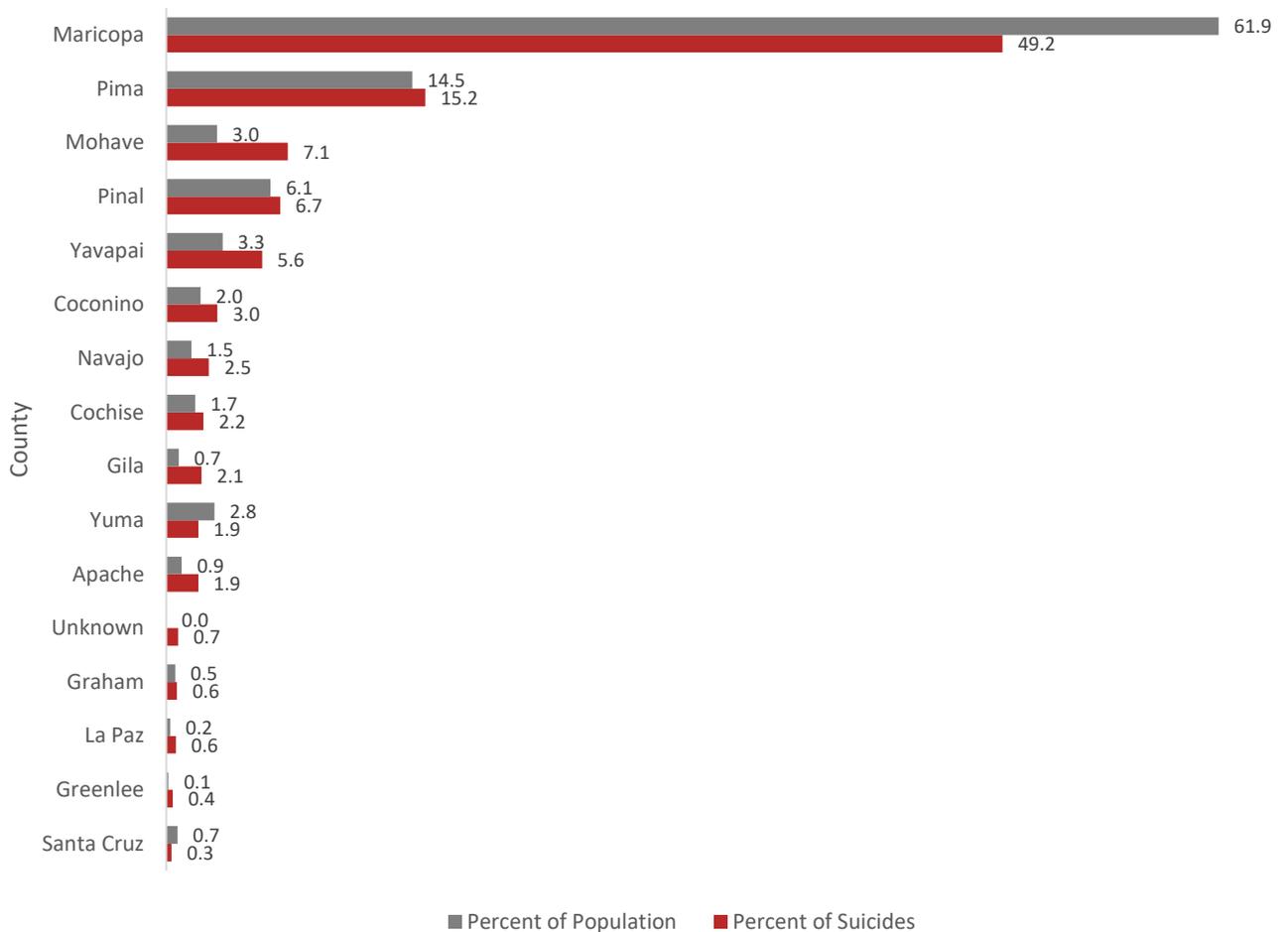
Data Source: Death certificates

Location

Arizona

Although Maricopa County houses the highest percentage of the Arizona population (61.9%), it had a lower percentage of the 2022 suicides (49.2%). In contrast, all other counties except for Yuma and Santa Cruz had higher percentages of Arizona suicide deaths compared to population percentages. Counties such as Mohave, Gila, and Apache had more than double the percentage of Arizona suicides compared to their populations. However, in Gila and Apache counties, both suicide and population percentages are low, making the influence of even a relatively small number of suicide cases more significant in this comparison.

Figure 21. Percentage of Arizona suicides relative to Arizona’s population by county, 2022 (n=1,596)

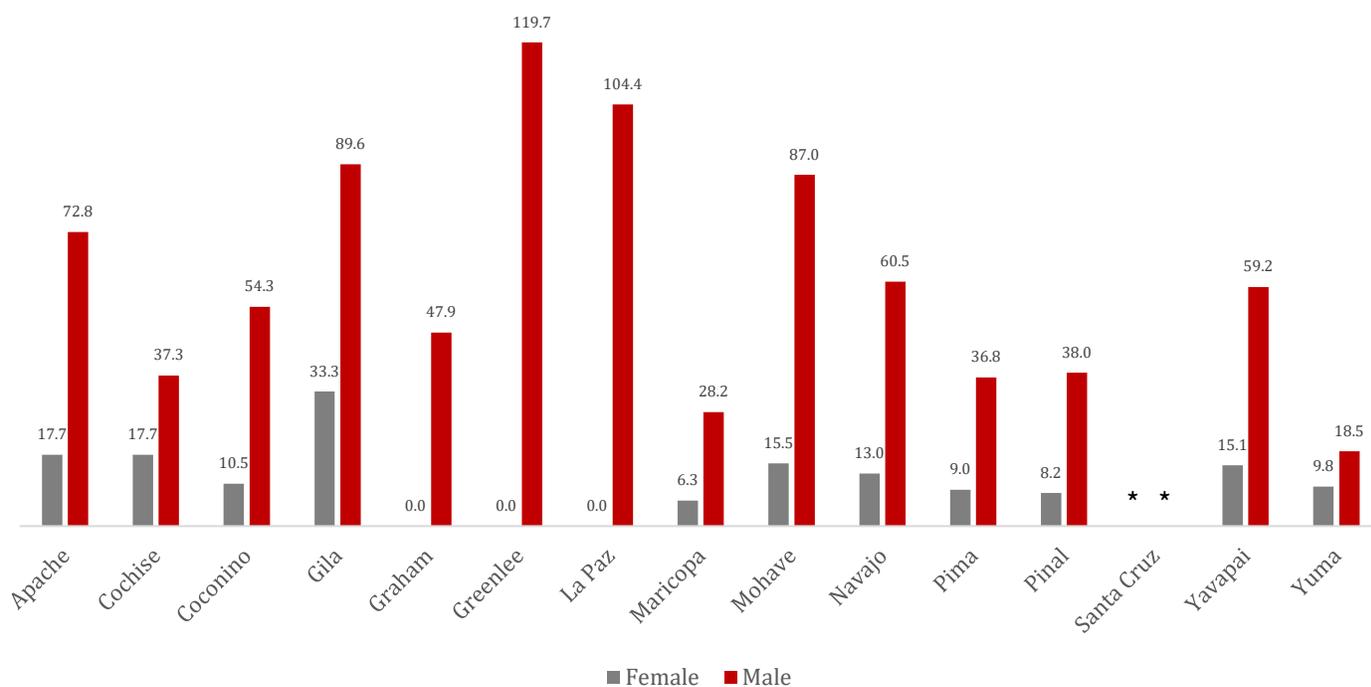


Data Source: Death certificates

Sex

Across all counties, the rate of suicide was much higher for males than females. The smallest difference in rates was seen for Yuma County, where the rate for males (18.5 per 100,000) is slightly less than twice the rate for females (9.8 per 100,000). The largest disparity between rates was seen in Greenlee and La Paz, where there were no female suicides in 2022, and male rates for suicide were 119.7 per 100,000 for Greenlee and 104.4 per 100,000 for La Paz.

Figure 22. Rate per 100,000 of female and male suicides by county of residence, Arizona 2022 (n=1,596)

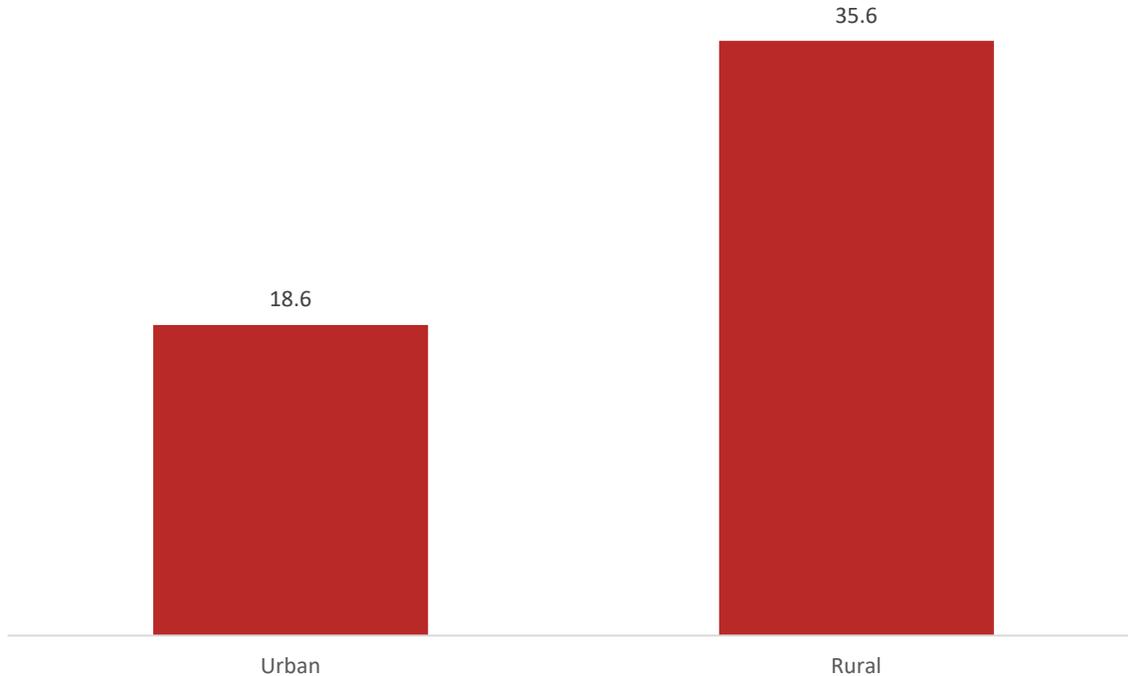


*Data suppressed due to low counts Data Source: Death certificates

Urban and Rural

When comparing suicide deaths in urban versus rural counties in 2022, suicide deaths in urban areas accounted for 71.1% of suicide deaths, while those in rural counties accounted for 28.9% of suicide deaths. However, the population-specific rate of suicide deaths in rural counties was almost twice as high (35.6 per 100,000 residents) as the rate of deaths in urban counties (18.6 per 100,000 residents).

Figure 23. Rate of suicides per 100,000 residents, by urban/rural counties, Arizona 2022 (n=1,596)

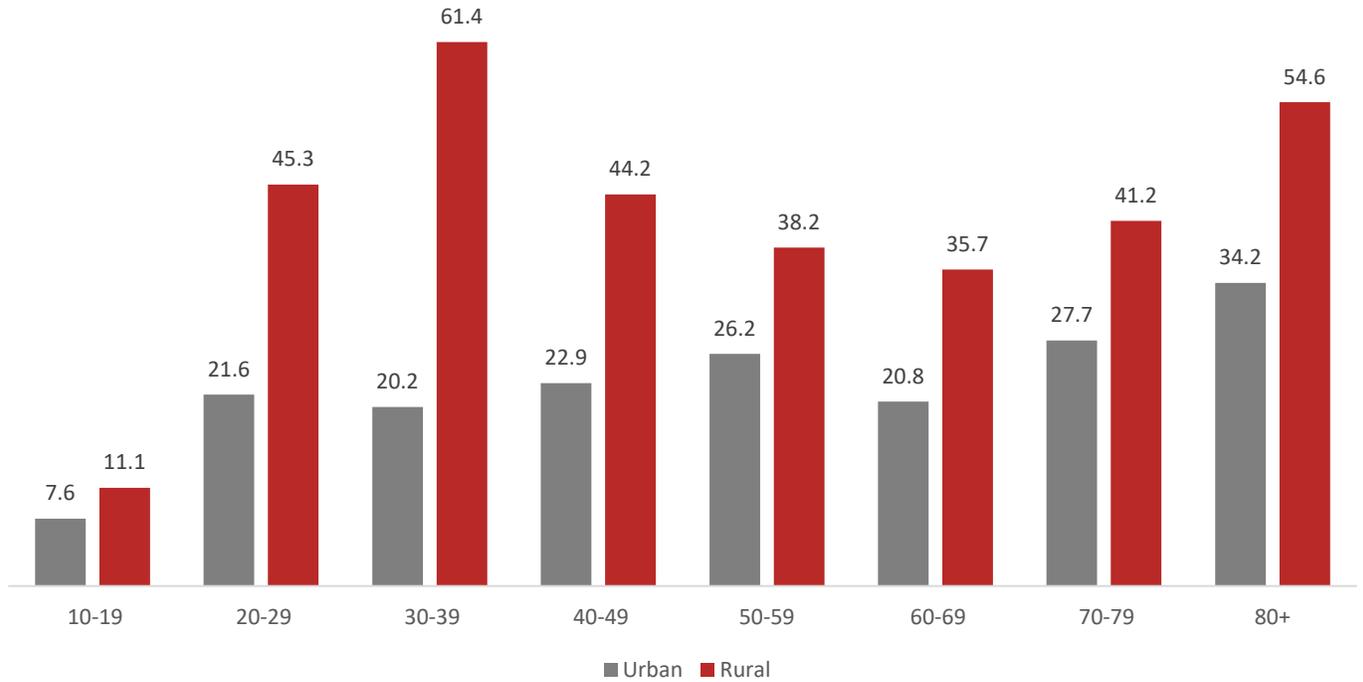


Data Source: Death certificates

Urban and Rural by Age

In 2022, there was a higher population-specific rate of suicide deaths in rural areas compared to urban deaths across all age groups. The widest difference in rates between rural and urban areas was in the 30 to 39-year age group, for which rural suicide death rates were 204.0% higher than the urban rates. The narrowest, but still significant, difference was for ages 10 to 19 years, where the rural rate was 46.1% higher than the urban rate. Data for ages 0 to 9 years has been suppressed to protect confidentiality. There are several social and socioeconomic differences between urban and rural areas that may influence these differences across age groups such as geographic isolation from social and mental health support, socioeconomic factors, access to firearms, and stigma¹⁰.

Figure 24. Suicide rate per 100,000 residents of urban/rural counties by age group, Arizona 2022 (n=1,596)

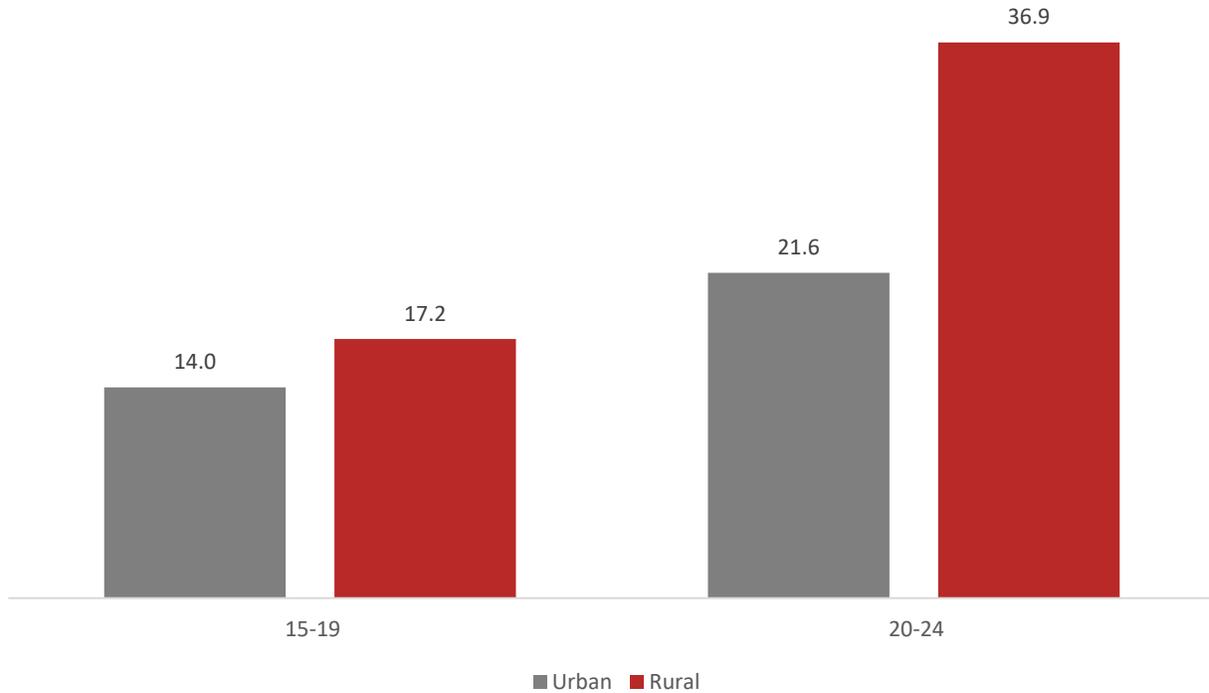


Data Source: Death certificates *Note: Rate for 0-9 has been suppressed due to low counts

Urban and Rural by Youth

Among youth, similar trends were found in which rural suicide rates were higher than those of urban rates. This difference was most pronounced for the 20 to 24 year age group, for which rural rates were 70.8% higher than urban rates. Data for rural youth ages 5 to 9 and 10-14 years has been suppressed to protect confidentiality.

Figure 25. Suicide rate per 100,000 residents for Arizona youth by urban/rural, 2022 (n=193)

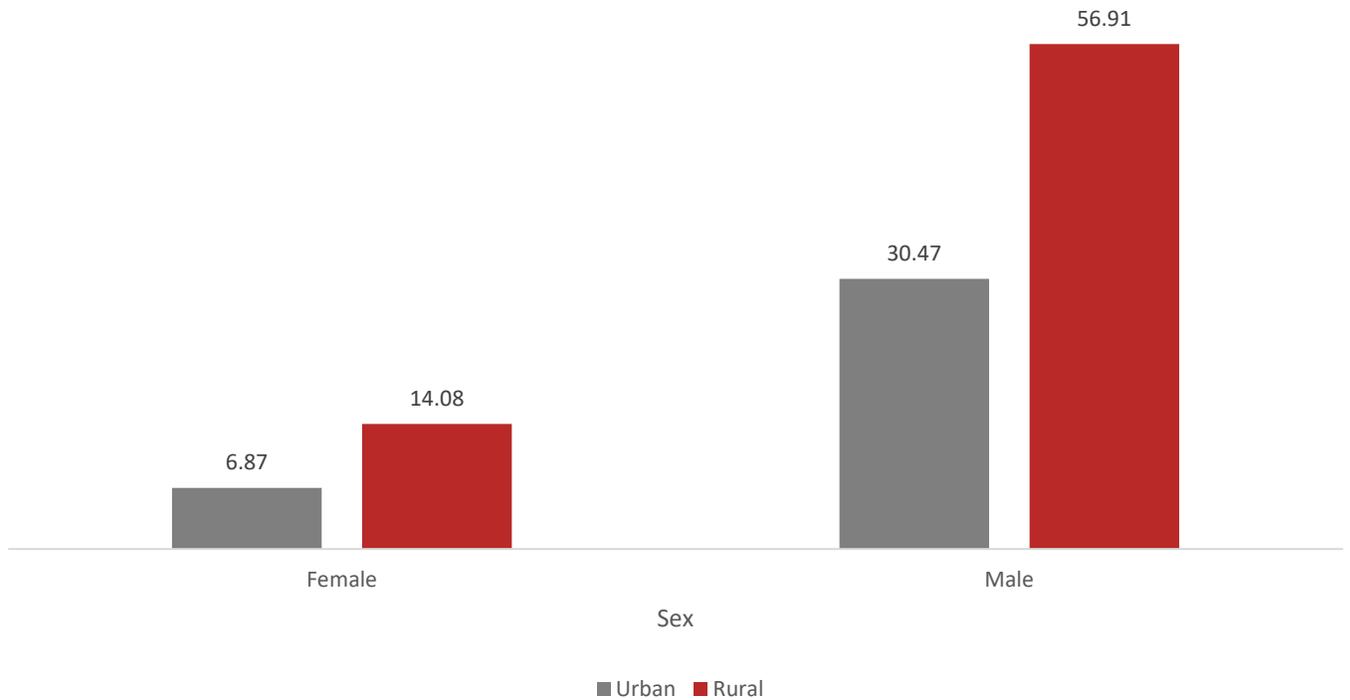


Data Source: Death certificates *Note: Rates for 5-9 and 10-14 have been suppressed due to low counts

Urban and Rural by Sex

Both females and males living in rural counties had higher suicide death rates when compared to urban residents (female 14.1 vs. 6.9 per 100,000, male 57.0 vs. 30.5 per 100,000). The difference between rural and urban death rates was higher for women than men, with the percent difference being 68.6% for women and 60.6% for men.

Figure 26. Suicide rates per 100,000 residents by sex and urban/rural, Arizona 2022 (n=1,596)

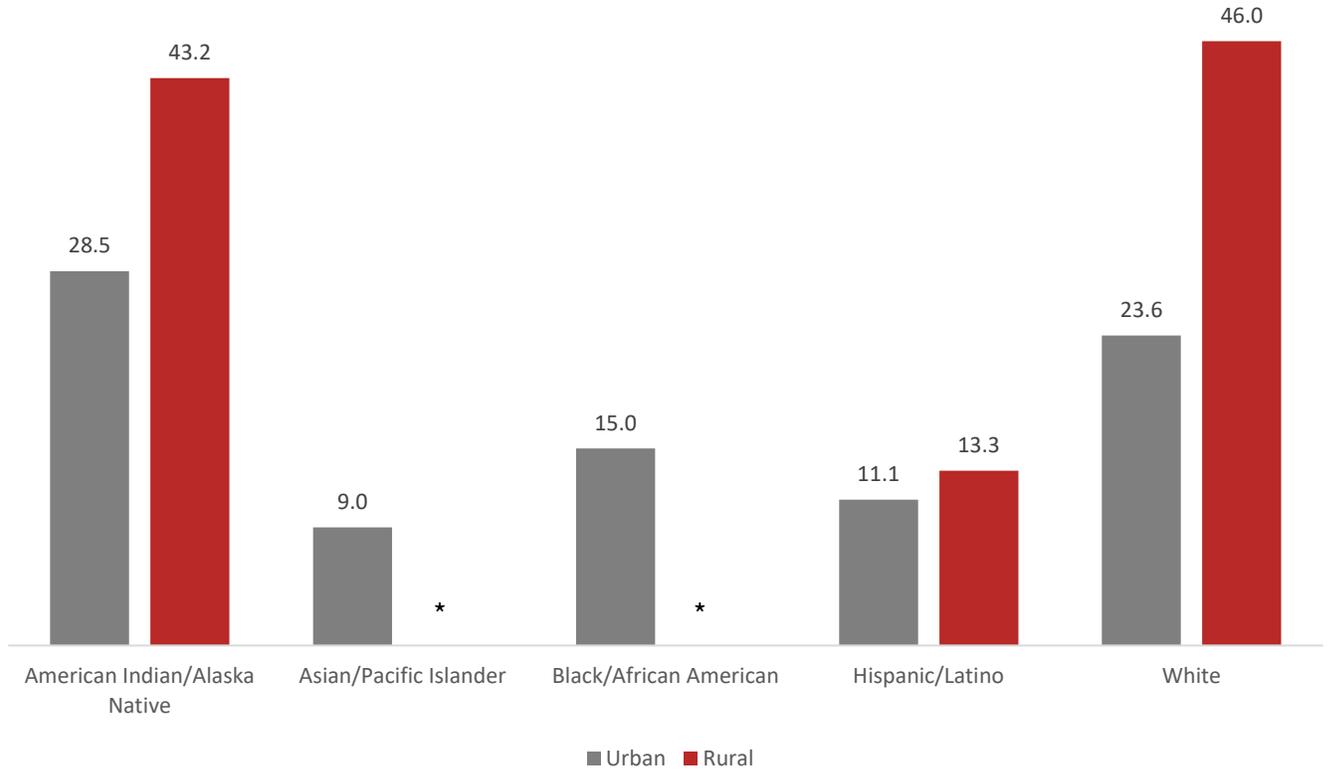


Data Source: Death certificates

Urban and Rural by Race and Ethnicity

As with age groups, higher rates of suicide deaths were observed in rural areas compared to urban areas for most race and ethnicity groups, with the exception of Black/African American, where the 2022 urban suicide death rate was higher than the rural rate. The highest rural rate and difference between rural and urban rates was for the White category, where rural suicide death rate was 46.0 suicide deaths per 100,000 race/ethnicity-adjusted residents, which was 94.9% higher than the urban rate of 23.6 per 100,000 residents, followed by the American Indian/Alaska Native group with a rural rate of 43.2 per 100,000 residents, which was 51.6% higher than the urban rate of 28.5 per 100,000 residents.

Figure 27. Suicide rates per 100,000 residents by race/ethnicity and urban/rural, Arizona 2022 (n=1,596)

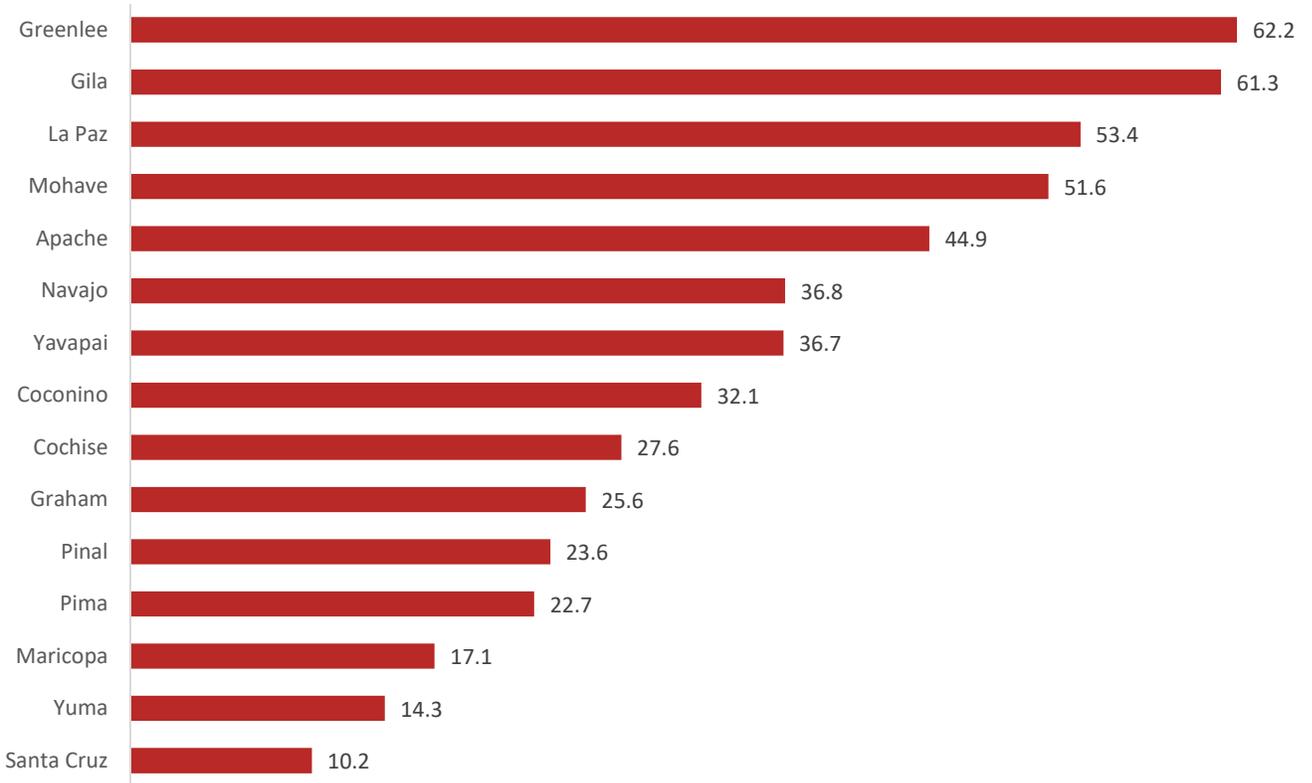


Data Source: Death certificates *Rates for rural Asian/Pacific Islanders and Black/African Americans have been suppressed due to low counts

County

The five counties with the highest rates of suicide deaths were Greenlee (62.2 deaths per 100,000 residents), Gila (61.3 per 100,000 residents), La Paz (53.4 per 100,000 residents), Mohave (51.6 per 100,000), and Apache (44.9 per 100,000 residents). Santa Cruz had the lowest rate of 10.2 suicide deaths per 100,000 residents. Consistent with comparisons of urban versus rural suicide death rates, Pima and Maricopa had lower rates than many of the more rural counties (22.7 per 100,000 and 17.1 per 100,000, respectively).

Figure 28. Suicide rates per 100,000 residents by county of residence, Arizona 2022 (n=1,596)

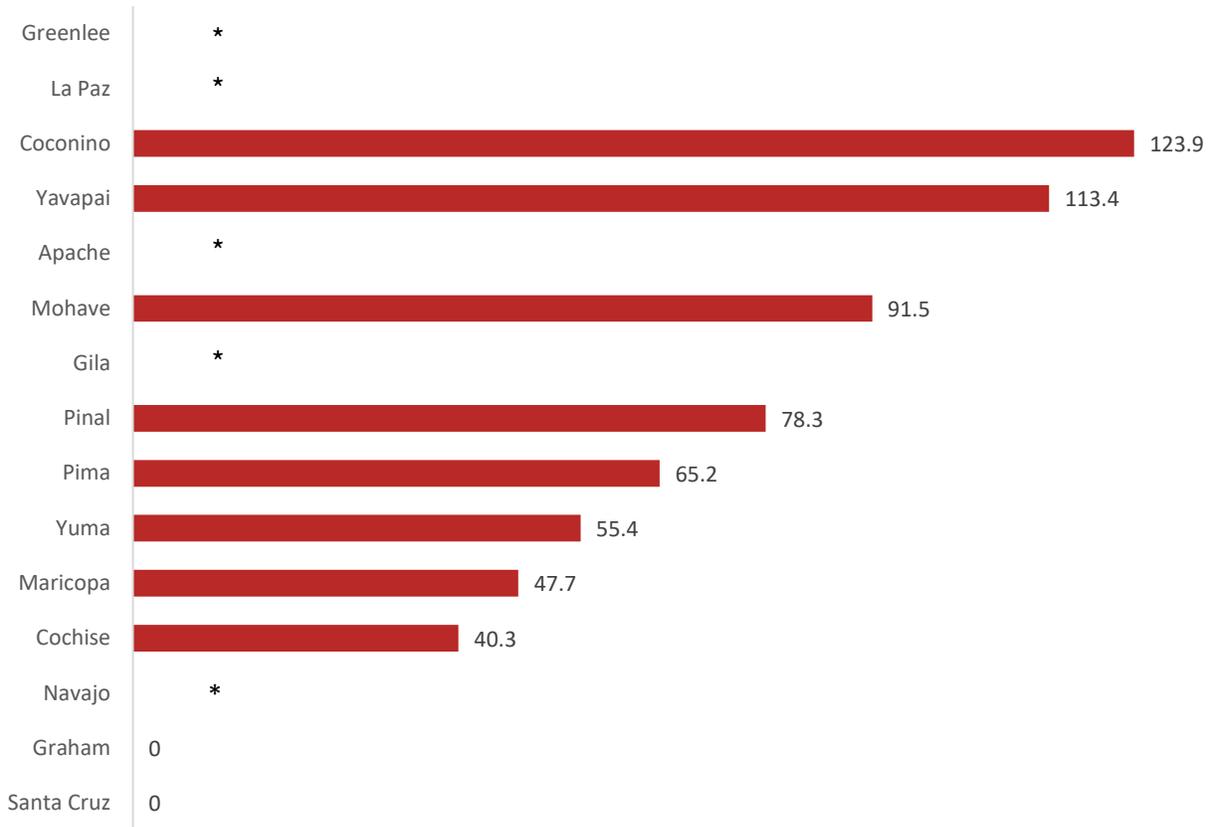


Data Source: Death certificates

Veterans by County

For veteran suicide deaths by county, Coconino had the highest rate (123.9 per 100,000 residents) followed by Yavapai (113.4 per 100,000 residents), and Mohave (91.5 per 100,000 residents) counties. Similar to geographical trends for Arizona as a whole, veteran suicide death rates in Pima and Maricopa were lower than many of the more rural counties (65.2 per 100,000 residents and 47.7 per 100,000 residents, respectively). Data for Greenlee, La Paz, Apache, Gila, and Navajo counties were suppressed to protect confidentiality. Graham and Santa Cruz counties had counts of zero.

Figure 29. Suicide rates per 100,000 veteran residents by county, Arizona 2022 (n=303)



Data Source: Death certificates *Note: Some county rates are suppressed due to low counts

Risk Ratio for Veterans by County

To understand regional differences in veteran risk for suicide death compared to non-veterans, counties in Arizona were divided into regions and evaluated using risk ratios and probability testing. The Northern region consisted of Apache, Coconino, Navajo, and Yavapai counties; the Central region consisted of Gila, Graham, Maricopa, and Pinal counties; the Western region consisted of Mohave, La Paz, and Yuma counties; and the Southeastern region was comprised of Cochise, Greenlee, Pima, and Santa Cruz counties. Among these regions, the Central area had the highest risk of veteran death by suicide compared to non-veterans (RR 3.16, 95% CI 2.67, 3.75), followed by the Southeastern (RR 3.16, 95% CI 2.40, 4.16) and Northern (RR 3.00, 95% CI 2.14, 4.21) regions. The Western region had the lowest risk ratio (2.82), but the widest confidence interval (95% CI 1.92, 4.13). This is likely because the Western region had the lowest total population of the four, resulting in less certainty of statistical tests.

Table 7. Veteran risk ratios by veteran status and region, Arizona 2012-2022

Region	RR	95% CI
Northern	3.00	2.136, 4.211
Central	3.16	2.667, 3.75
Western	2.82	1.923, 4.126
Southeastern	3.16	2.398, 4.161

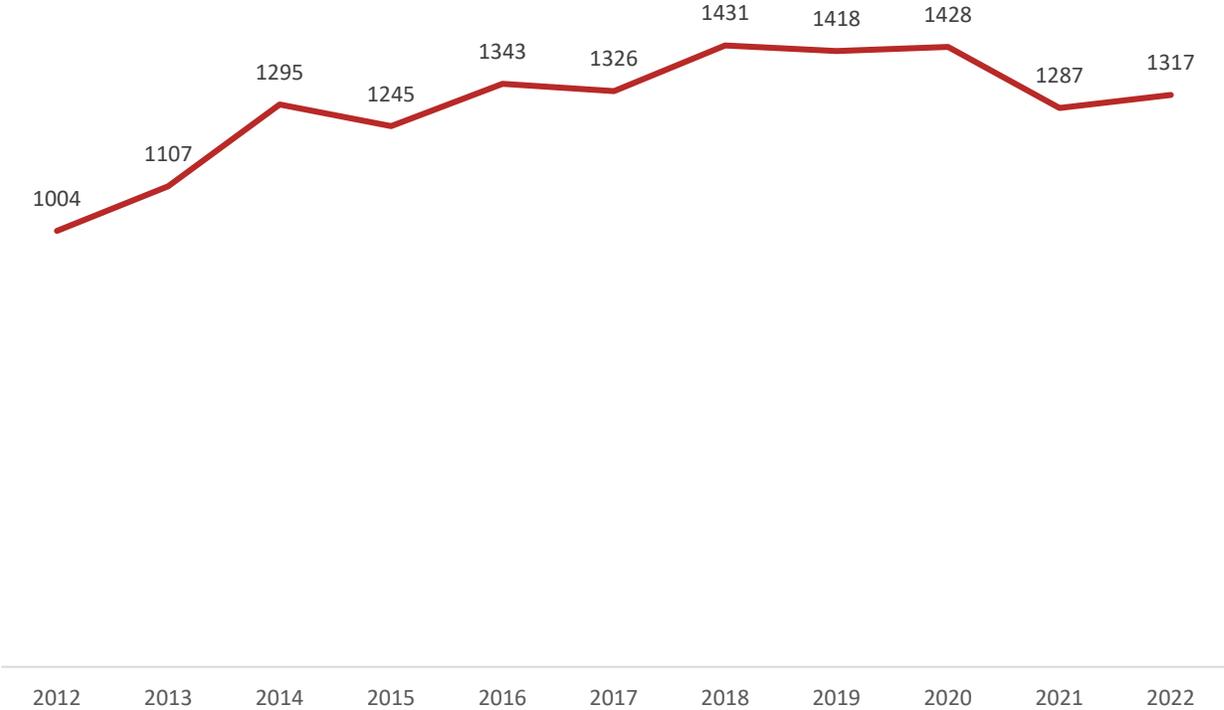
Data Source: Death certificates *Veteran residents of each region were compared with non-veteran residents of each region

Medical History

History of Previous Medical Encounters Within Six Months Prior to Death

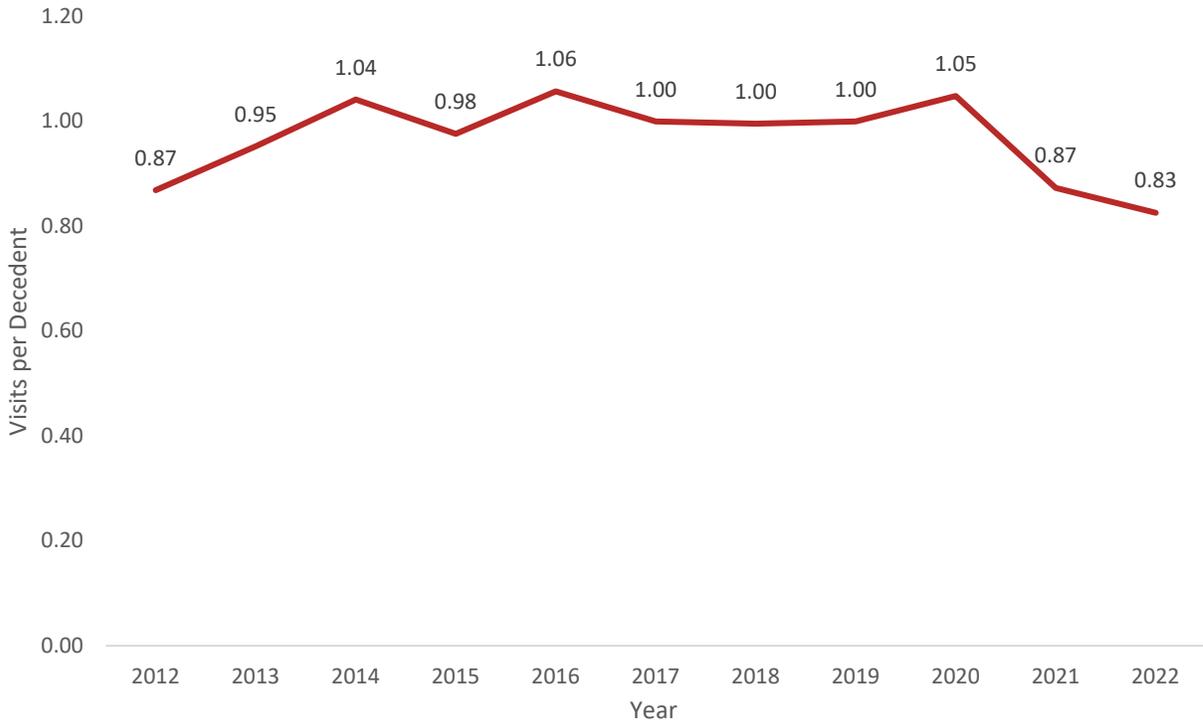
From 2012 to 2022, the combined number of hospital visits among suicide decedents increased by 31.2%. There was a 9.8% decrease in hospital visits from 2020 to 2021, which increased slightly (2.3%) in 2022. However, the total number of hospital visits per decedent in 2012 was 0.87, whereas in 2022, this number was very similar at 0.83 visits per decedent. This means that there was almost 1 hospital visit per person who died by suicide in 2022, just looking at the 6 months before their death. This metric aids in identifying a possible intervention point for screening or services.

Figure 30. Number of hospital visits in the 6 months prior to death by suicide decedents, Arizona 2012-2022



Data Source: Death certificates and Hospital Discharge Data

Figure 31. Number of hospital visits per suicide decedent in the 6 months prior to death, Arizona 2012-2022

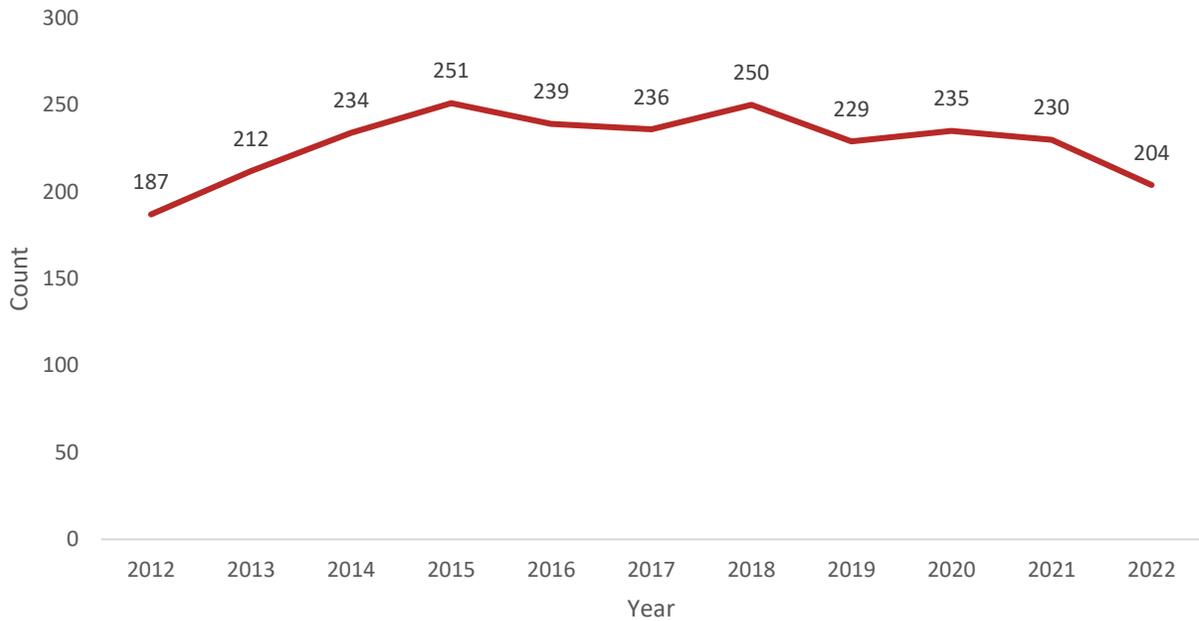


Data Source: Death certificates and Hospital Discharge Data

Veteran History of Previous Medical Encounters Within Six Months Prior to Death

From 2012 to 2022, the combined number of hospital visits among veteran suicide decedents increased from 2012 to 2015, then began to decline from 2018. There was an 18.4% decrease in hospital visits from 2018 to 2022. However, the average number of hospital visits per decedent in 2012 was 0.72, whereas in 2022, this number was slightly lower (6.9% decrease) at 0.67 visits per decedent.

Figure 32. Number of hospital visits in the 6 months prior to death by veteran suicide decedents, Arizona 2012-2022



Data Source: Death certificates and Hospital Discharge Data.

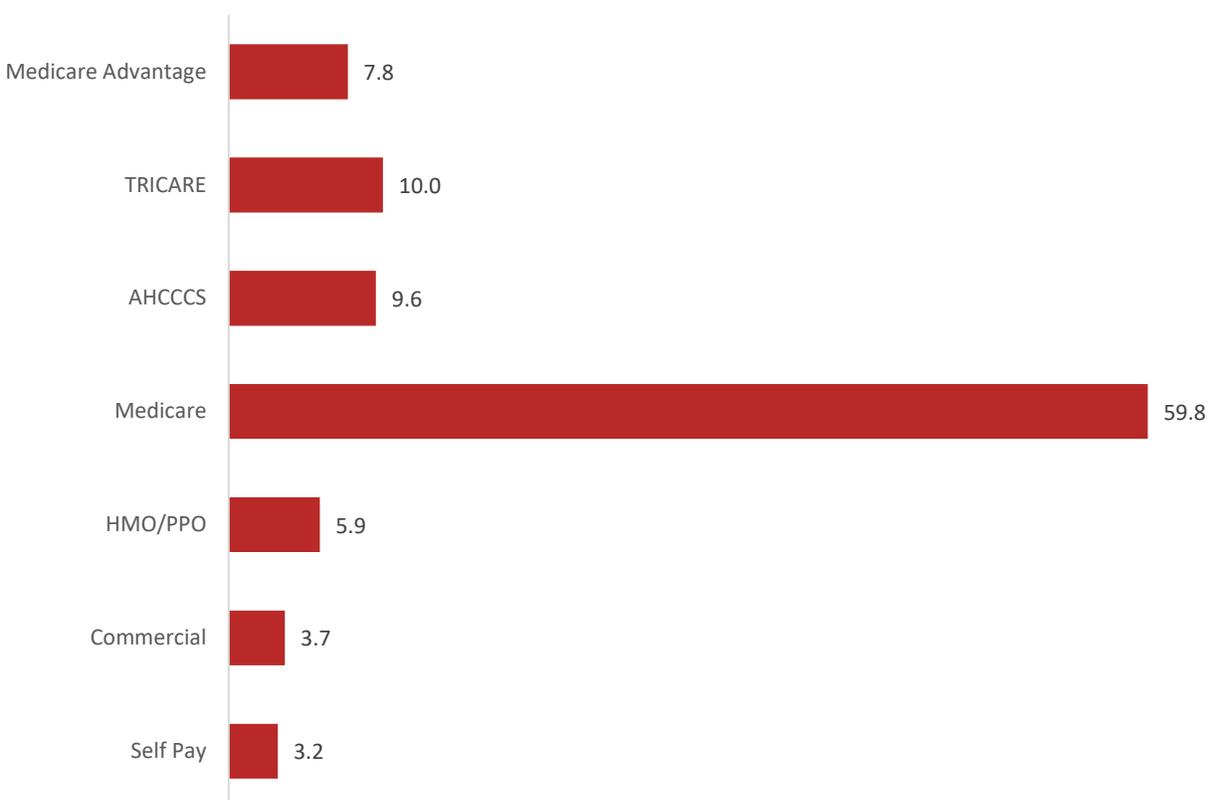
Figure 33. Number of hospital visits per veteran suicide decedent in the 6 months prior to death, Arizona 2012-2022



Data Source: Death certificates and Hospital Discharge Data.

Medicare was by far the highest percentage of payment type for veteran decedents (59.8%). Tricare and AHCCCS were similar at 10.0% and 9.6%, respectively, followed by Medicare Advantage (7.8%). Non-state and non-federal insurance such as PPO, HMO, and Commercial plans together accounted for a total of 9.6% of decedent insurance, while self-pay was utilized by 3.2% of veteran decedents.

Figure 34. Percentage of each payment type for hospital encounters of veteran suicide decedents, Arizona 2022 (n=204)



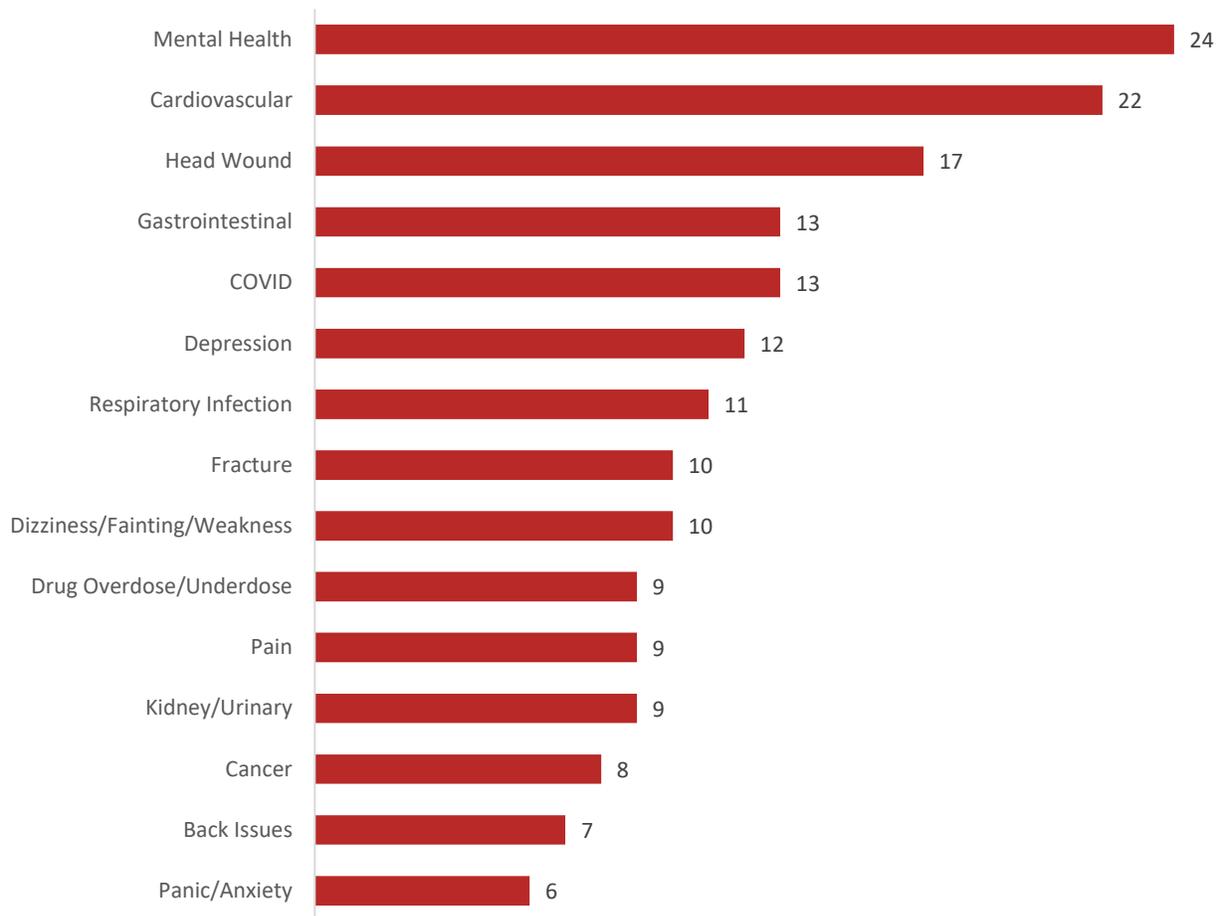
Data Source: Death certificates and Hospital Discharge Data *Note: Percentages are for hospital encounters within 6 months of death

Veteran Most Common Principal Diagnoses in Previous Medical Encounters

Principal diagnoses in hospital discharge data capture the condition established as chiefly responsible for the hospital or ED admission. Out of the 204 veteran visits identified, the most common principal diagnosis in all hospital and ED visits for veterans who died by suicide in 2022 was mental health (n=24), including depression, panic disorder, anxiety, homicidal ideation, bipolar disorder, or psychotic disorder; followed by cardiovascular conditions

(n=22), head wounds (n=17), gastrointestinal disorders (n=13), and COVID-19 illness (n=13). Head wounds and certain mental health diagnoses may be due to the suicide event admission itself. In future studies, data modernization efforts at ADHS will allow for a more robust analysis of prior medical history to rule out admission events due to fatal suicide.

Figure 35. Principal diagnosis of recent hospital encounters for veteran suicide decedents, Arizona 2022 (n=204)



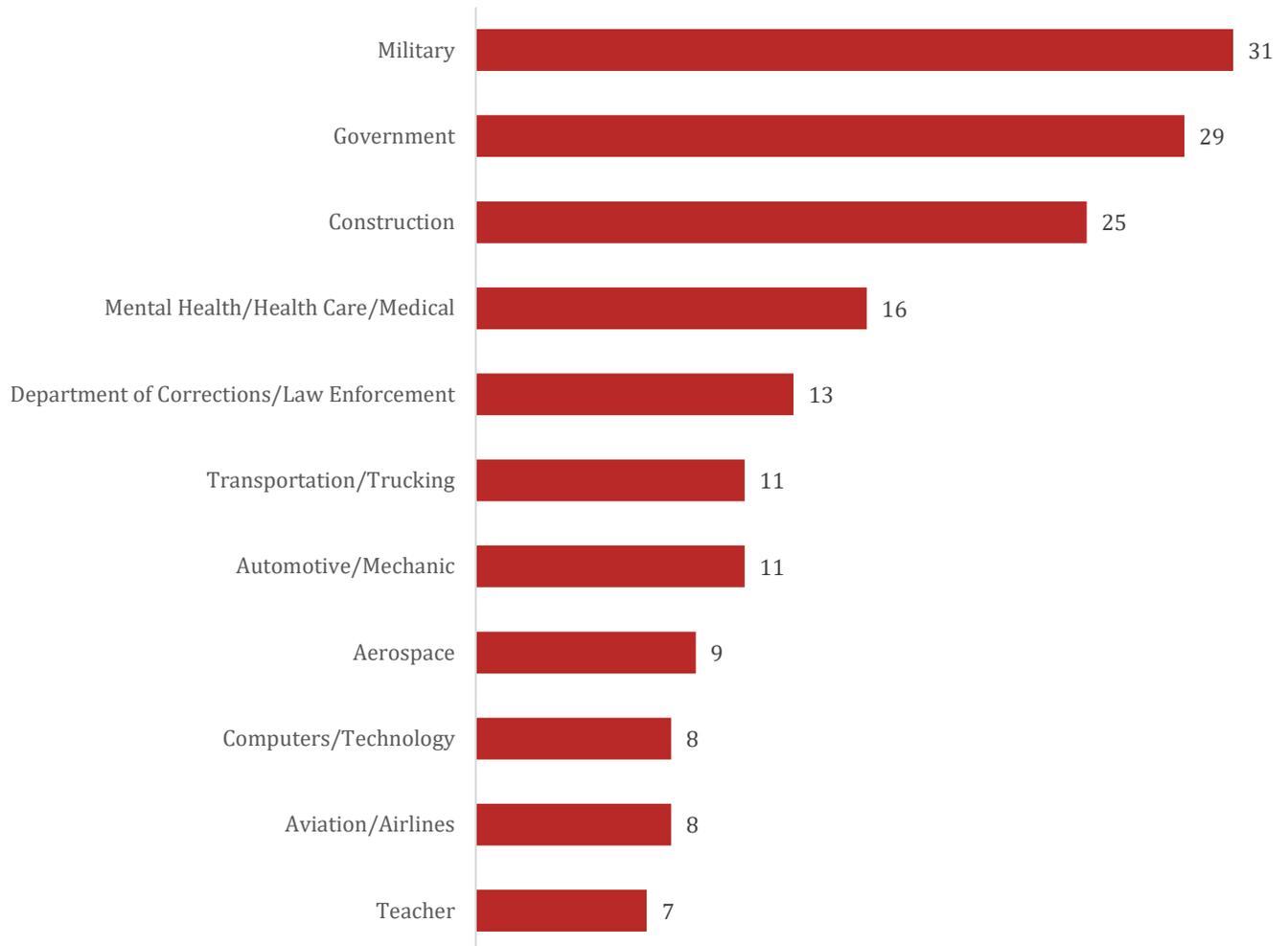
Data Source: Death certificates and Hospital Discharge Data *Note: Counts are for hospital encounters within 6 months of death

Occupations

Veteran Occupations

Of suicide death occupations for veterans, military (n=31) and government (n=29) were the two most common, although these correspond with past military service and may not reflect the most current employment at the time of death. Following those, construction (n=25), health care or mental health staff (n=16), law enforcement or Department of Corrections (n=13), transportation (n=11), and automotive/mechanic (n=11) fields were the most common.

Figure 36. Common industries of occupation for veteran suicide decedents, Arizona 2022 (n=303)



Data Source: Death certificates

Self-Inflicted Injuries

Introduction

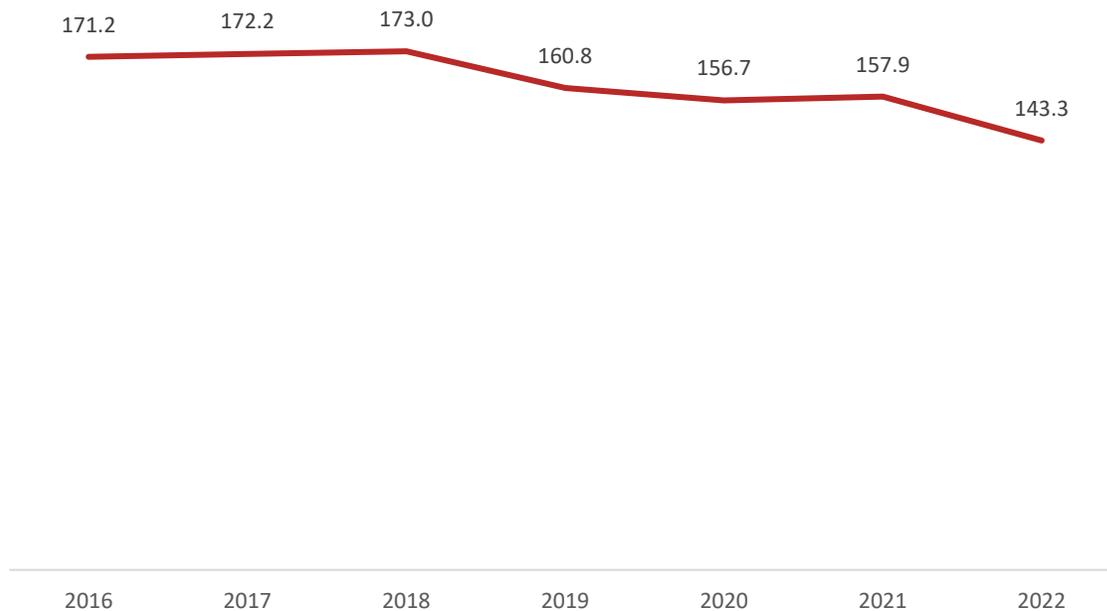
Hospital and emergency department (ED) visit reports where individuals presented with self-inflicted injuries were compiled from hospital discharge data. However, of these self-inflicted injuries, no determination was made between fatal and non-fatal injuries, and intent could not be determined. There is a difference in the backgrounds, intent, and outcomes between non-suicidal self-injuries (NSSIs), otherwise known as self-injury or self-harm, and suicide attempts. NSSI tends to be more frequent than suicidal attempts and often reflects a maladaptive coping mechanism rather than acting on suicidal ideation^{11 12 13 14}.

Totals and Rates

Arizona

Hospital and ED visits due to self-inflicted injury decreased from 11,886 in 2016 to 10,615 in 2022 (16.3% decrease), with a 9.2% decrease from 2021 to 2022 (11,489 to 10,615).

Figure 37. Rates per 100,000 residents of hospital and ED visits for self-inflicted injuries, Arizona 2016-2022

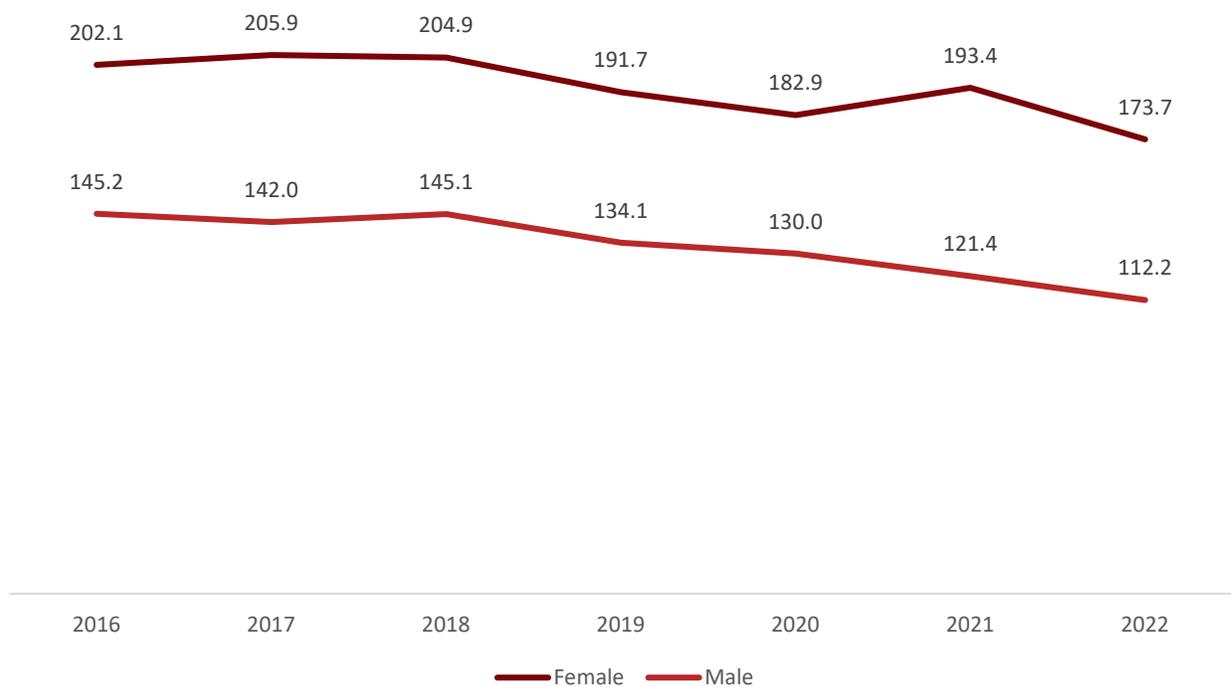


Data Source: Hospital Discharge Data

Sex

Compared to males, females consistently had higher rates of hospital and ED visits due to self-inflicted injury from 2016 to 2022. In 2022, this female rate (173.7 per 100,000 residents) was 54.8% higher than the male rate (112.2 per 100,000 residents). This is in contrast to the consistently higher rates of male suicide deaths compared to females since 2016.

Figure 38. Rates per 100,000 residents of hospital and ED visits for self-inflicted injuries by sex, Arizona 2016-2022



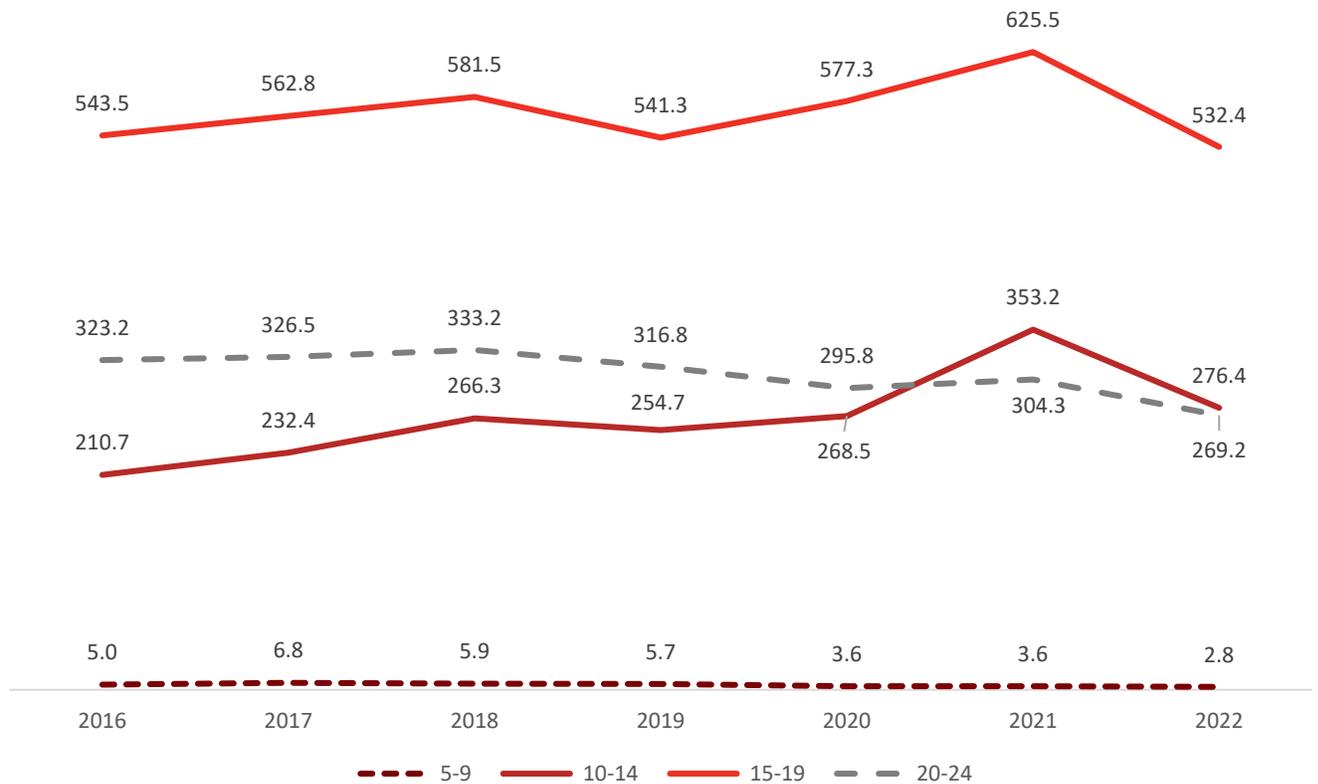
Data Source: Hospital Discharge Data

Youth

Youth hospital and ED admission rates due to self-inflicted injury varied by age group, with the highest admission highest among 15 to 19 year olds (532.4 per 100,000 residents in 2022), followed by 10 to 14 years olds (276.4 per 100,000 residents in 2022), and 20 to 24 year olds (269.2 per 100,000 residents in 2022). The lowest rate was among youth ages 5 to 9, this rate has decreased from 5.0 visits per 100,000 residents in 2016 to 2.8 per 100,000 residents in 2022. The rate of hospital and ED visits has declined among all groups except for youth ages 10 to 14, which spiked to 353.2 per 100,000 in 2021 and has since decreased somewhat to 276.4 per 100,000 residents in 2022. Additional prioritization for surveillance and monitoring

is suggested for this group as it has experienced a 31.2% incline in visits due to self-inflicted injury from 2016 to 2022.

Figure 39. Rates per 100,000 youth of hospital and ED visits for self-inflicted injuries, Arizona 2016-2022

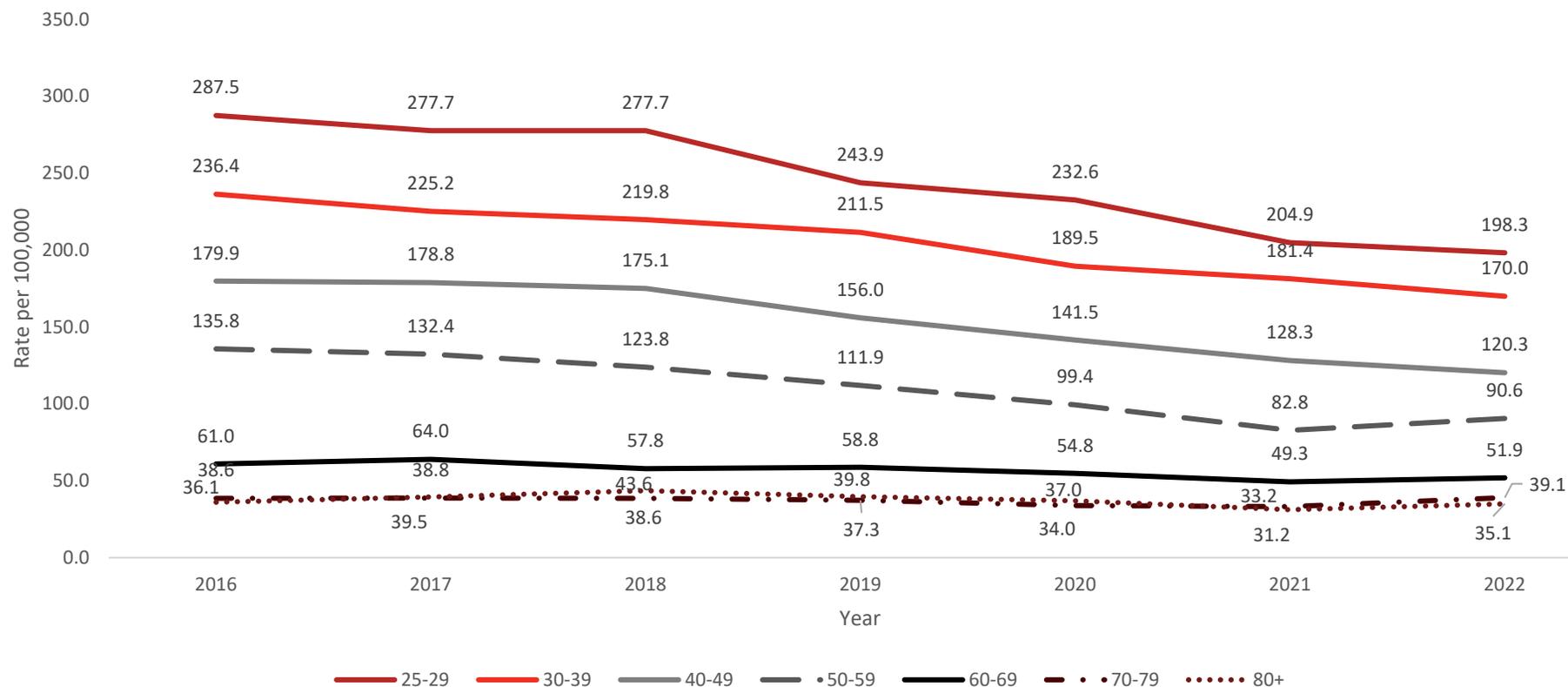


Data Source: Hospital Discharge Data

Adult

All age groups, except for 70 to 79 years of age, had a decline in hospital and ED visits from 2016 to 2022. The age group with the higher rate of self-inflicted injury visits was 25 to 29 years (198.3 per 100,000 residents), although this group also had the largest decline since 2016 (31.0%). Although the 70 to 79 and 80 years and over age groups had the two lowest visit rates, they have fluctuated since 2016, with 70 to 79 years of age being just higher (39.1 per 100,000 residents) in 2022 compared to 80 years and over (35.1 per 100,000 residents).

Figure 40. Rates per 100,000 adults of hospital and ED visits for self-inflicted injuries, Arizona 2016-2022

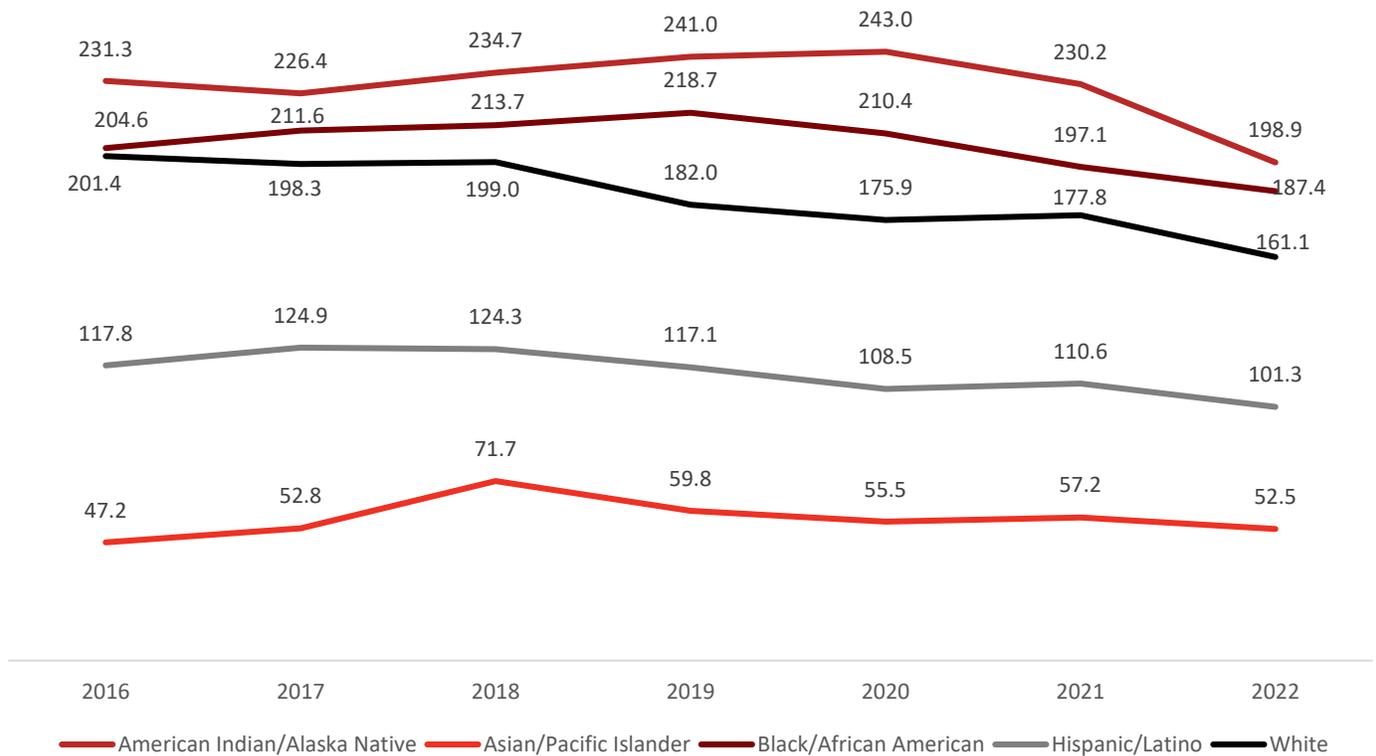


Data Source: Hospital Discharge Data

Race and Ethnicity

By race and ethnicity, the American Indian and Alaska Native population consistently had the highest rate of hospital and ED visits for self-inflicted injury from 2016 to 2022. However, there has been a steady decline in visit rates for this group since 2020. The same decline was observed for the Black and African American population, whose decline began in 2019. Self-inflicted injury visit rates for White, Hispanic and Latino, and Asian and Pacific Islander groups have remained relatively stable from 2020 to 2022.

Figure 41. Rates per 100,000 residents of hospital and ED visits for self-inflicted injuries by race/ethnicity, Arizona 2016-2022



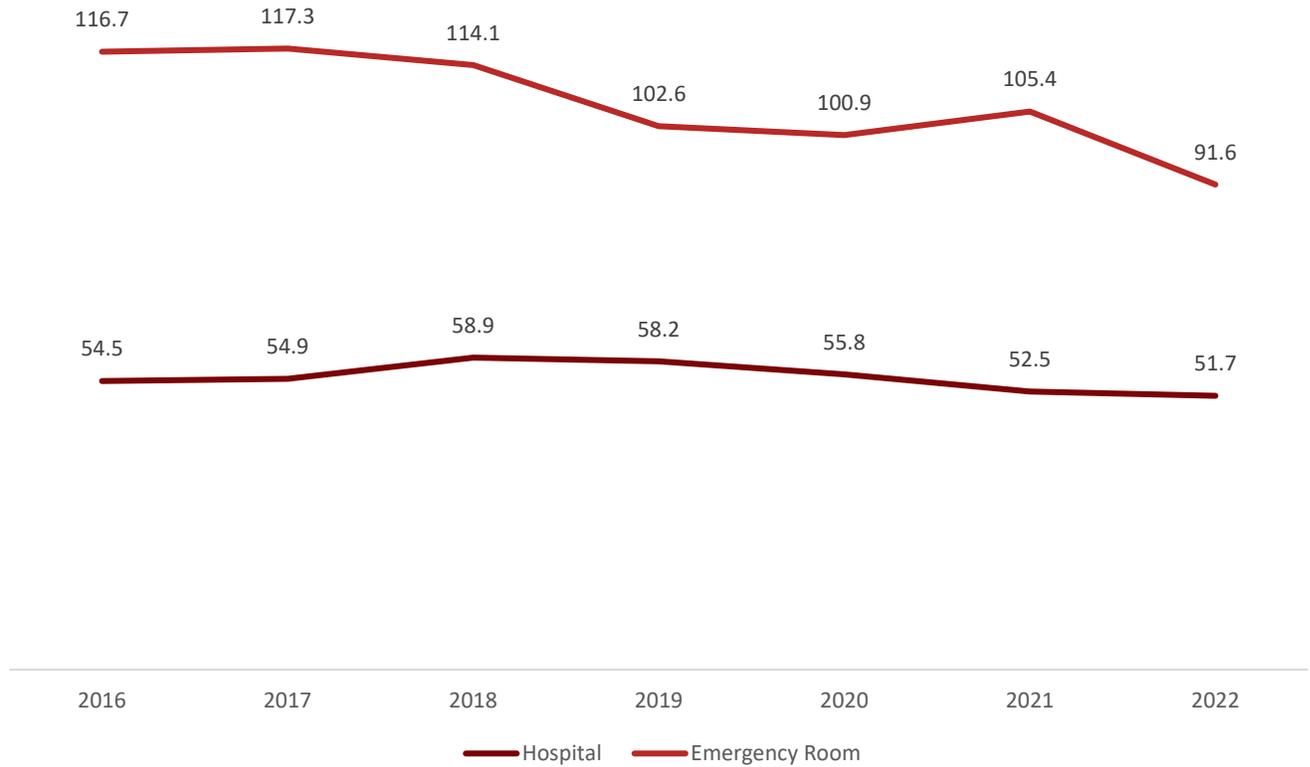
Data Source: Hospital Discharge Data

Medical Facility Utilization

Arizona

As expected, emergency department (ED)/emergency room (ER) visit rates were consistently higher than those of hospitalizations, as hospitalizations reflect more serious injuries. However, ED visit rates have declined overall (21.5% decrease) since 2016, while hospitalizations have only slightly declined (5.1% decrease). Additionally, ED visits declined by 13.1% from 2021 to 2022 alone, while hospitalizations only declined by 1.5% during this time. This trend may be observed due to a decline in admissions for less serious self-inflicted injuries, but steady rates for those more serious injuries. Whether a decrease in admissions for less serious injuries is due to an actual decrease in individuals engaging in self-harm, or from a decrease in seeking care for self-harm, it cannot be determined from these data.

Figure 42. Rates per 100,000 residents of hospitalizations and emergency room visits for self-injury, Arizona 2016-2022

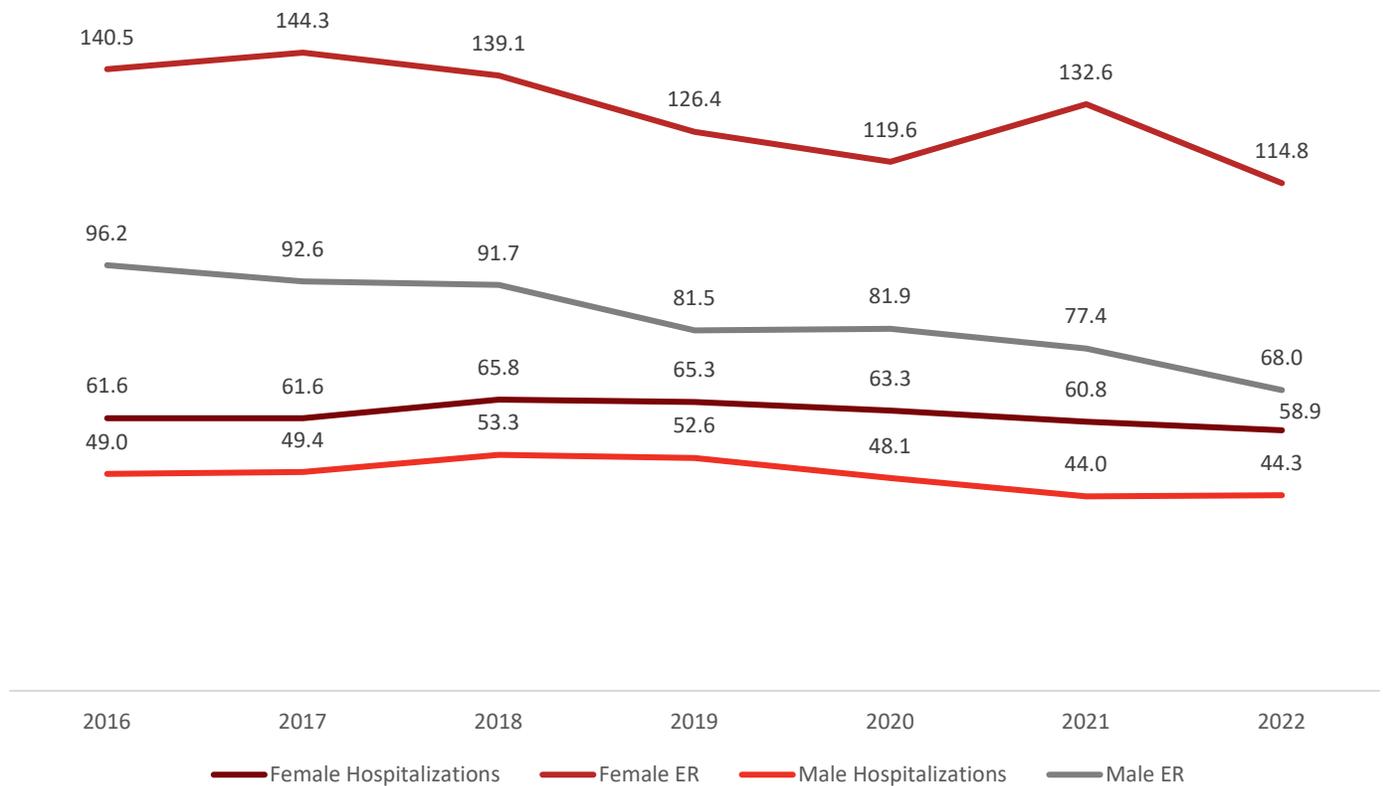


Data Source: Hospital Discharge Data

Sex

As with self-inflicted hospital and ED visits as a whole, females consistently had higher rates of both hospital and ED visits due to self-inflicted injury than males from 2016 to 2022. In 2022, the female ED visit rate (114.8 per 100,000 residents) was 68.8% higher than the male rate (68.0 per 100,000 residents), and the female hospitalization rate (58.9 per 100,000 residents) was 33.0% higher than the male rate (44.3 per 100,000 residents). As with self-inflicted visits as whole, this is in contrast to the consistently higher rates of male suicide deaths compared to females since 2016.

Figure 43. Rates per 100,000 residents of hospitalizations and emergency room visits for self-injury by sex, Arizona 2016-2022

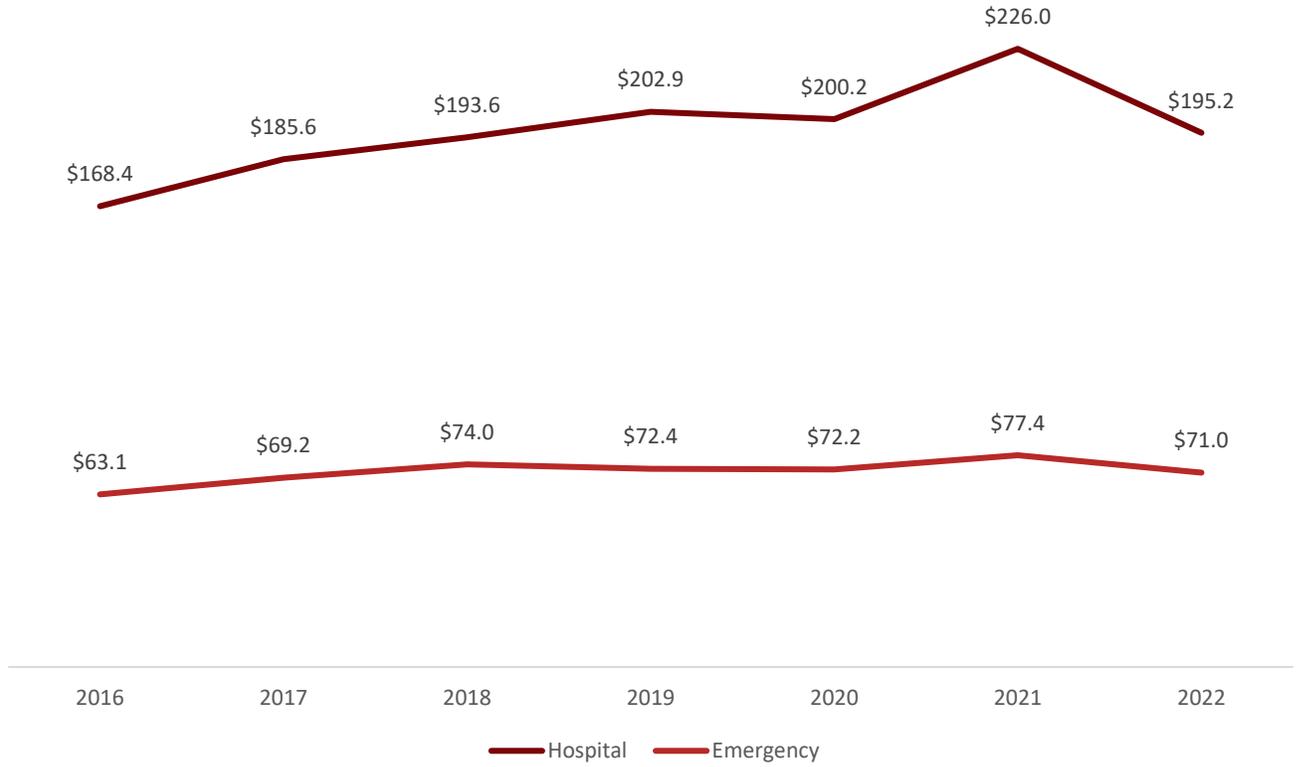


Data Source: Hospital Discharge Data

Costs

Costs for self-inflicted injury medical encounters had increased from 2016 to 2019, and were relatively stable except for the spike in 2021 for both hospital and ED visit encounters. Since no spike in the rate of hospital visits for self-inflicted injury was observed in 2021, this cost spike may have been attributed to additional costs associated with COVID-19 precautions during the pandemic. A smaller spike for ED costs was observed in 2021 as well, although there was a similar spike in the ED visit rate that year that might account for increased costs. These costs have been collected from hospital discharge data directly, but not adjusted for inflation.

Figure 44. Total cost of self-injury hospital and emergency room visits in millions, Arizona 2016-2022



Data Source: Hospital Discharge Data *Note: Units are in millions. \$168.4= \$168,400,000

Limitations

Several limitations should be kept in mind when reviewing data included in this report.

Calculations

With smaller population denominators and smaller numbers of cases (e.g. death or hospital visits), rates are considered more unstable, meaning they are more vulnerable to inaccuracy when cases or denominators miss or unintentionally include additional individuals. Caution should be used when interpreting special populations and more rural areas described in this report.

This report is a cross-sectional analysis of events and rates for 2022, with no additional statistical testing to quantify the significance of relationships between various factors and outcomes. As such, data should be interpreted with caution in identifying potential associations, and without conclusions about cause and effect.

No covariates were evaluated or accounted for in risk ratio calculations.

Reporting Completeness

Individuals with self-inflicted injuries may not always present to a hospital or ED, so these events are likely underestimated in this report. Additionally, these injuries include both those related to non-fatal and fatal suicide attempts as well as those with non-suicidal intent. Future data modernization efforts at ADHS will facilitate these delineations in subsequent reports.

Other Contributing Factors for Suicide

Most of this analysis could not consider social determinants of health that may have played a role in any particular suicide or self-inflicted injury event, such as economic stability, access to health providers or behavioral health care, or other environmental impacts. The annual Suicide Mortality Review Report contains more information on contributing factors related to suicide deaths.

Conclusions

Connecting Data to Implementation

In 2021, state Suicide Prevention efforts moved from the Arizona Health Care Cost Containment System (AHCCCS) to Arizona Department of Health Services (ADHS). The program officially began in January of 2022, with the hiring of a Suicide Prevention Program Manager and the publication of Arizona's 2022 - 2023 Suicide Prevention Action Plan (SPAP). That SPAP sought to establish a solid data foundation that could be built on, including the creation of a publicly facing suicide death data dashboard in 2022. This effort was further expanded in 2023, establishing a suicide encounter dashboard, displaying hospitalization and in-patient data from the National Syndromic Surveillance Program, relating to suicidal ideation and suicide attempts.

The 2024 - 2026 SPAP aims to add to the progress of the previous plan by sustaining successful initiatives, maintaining data transparency, and greatly expanding partnerships and collaboration. As part of the data transparency effort, ADHS will be combining the Suicide Surveillance and Self-Inflicted Injury Report with newly collected data from the Arizona Suicide Mortality Review program, to create an all-new report for 2024, focusing on 2023 data. This new report will communicate a more complete understanding of Arizona's suicide environment, offer more context to the information presented, and assist Arizona's suicide prevention advocates, state and local government, and other stakeholders in their work. The Arizona Suicide Surveillance and Self-Inflicted Injury Report is an essential component of Arizona's overall suicide prevention efforts. Accurate data, collected and analyzed within Arizona, by epidemiologists who understand the unique risk and protective factors at play, presents a solid foundation from which to strategically plan, as well as measure the impact of initiatives taking place within our communities every day.

As the Arizona Suicide Surveillance and Self-Inflicted Injury Report is unveiled, ADHS acknowledges a deep commitment to its enduring impact. ADHS's responsibility does not end with the completion of this document; rather, it marks the beginning of an ongoing journey to save lives and protect the well-being of Arizona's citizens. ADHS is determined to continuously improve our strategies, embrace innovation, and engage our communities to build a sustainable future where suicide prevention remains a top priority. Together, we can create a legacy of hope, resilience, and support that transcends generations.

Resources

- 1) Arizona State Crisis Hotline
 - a. **Phone** - 1-844-534-HOPE (4673)
 - b. **Text** - 4HOPE (44673)
 - c. **Chat** - <https://crisis.solari-inc.org/start-a-chat/>
- 2) Arizona Local Crisis Hotlines
 - a. **1-866-495-6735** - Cochise, Graham, Greenlee, La Paz, Pima, Pinal, Santa Cruz and Yuma Counties
 - b. **1-800-631-1314** or **1-602-222-9444** - Maricopa County
 - c. **1-877-756-4090** - Apache, Coconino, Gila, Mohave, Navajo and Yavapai Counties
 - d. **1-800-259-3449** - Gila River and Ak-Chin Indian Communities
 - e. **1-855-331-6432** - Salt River Pima Maricopa Indian Community
 - f. **1-844-423-8759** - Tohono O’odham Crisis Line
 - g. **1-855-728-8630** - Tribal Warm Line
- 3) National Suicide and Crisis Hotline - **988**
 - a. **Veteran’s Crisis Line** - Option 1
 - b. **Spanish Language** - Option 2
 - c. **LGBTQIA2S+** - Option 3
 - d. **Chat** - <https://988lifeline.org/chat/>
 - e. **Text** - Text 988 to get connected
- 4) Teen Lifeline
 - a. A peer-to-peer hotline providing a safe place for teens to connect with someone they can relate to
 - b. Call and Text Crisis Line: **1-602-248-8336 (TEEN)** - Maricopa County Only
 - c. Outside Maricopa County, call **1-800-248-8336 (TEEN)**
- 5) Veterans
 - a. **Be Connected** - Connecting Arizona service members, veterans, families & helpers to information, support and resources.
 - i. Webpage - <https://www.beconnectedaz.org/>
 - ii. Call to be connected to a counselor - **866-429-8387**
 - b. **U.S. Department of Veteran Affairs**
 - i. Find VA Locations - <https://www.va.gov/find-locations>
 - ii. VA benefits hotline - **800-827-1000**
 - iii. National Call Center for Homeless Veterans - **877-424-3838**
 - c. **Arizona Department of Veteran Services**

- i. **Arizona Benefits Guide** - <https://dvs.az.gov/information/arizona-benefits-guide>
 - ii. **Arizona Veteran Courts** - <https://dvs.az.gov/information/veteran-courts>
 - iii. **Phone:** 602-255-3373
 - iv. Other resources
- 6) Please visit the **Arizona State Suicide Prevention** webpage for more resources:
<https://www.azdhs.gov/prevention/chronic-disease/suicide-prevention/index.php#local-national-resources>

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Appendix A

Table 8. Number of Suicides and Suicide Mortality Rates by Age Group and Year, Arizona, 2012-22

Age Group		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
0-9	Count	0	0	0	0	*	0	0	0	0	0	*
	Rate	0	0	0	0	*	0	0	0	0	0	*
10-19	Count	61	41	65	77	64	78	98	66	87	84	78
	Rate	6.6	4.4	7.1	8.4	7.0	8.4	10.4	6.9	9.2	8.9	8.1
20-29	Count	178	188	180	199	211	226	242	244	237	286	262
	Rate	20.1	21.0	19.3	21.1	22.1	23.2	24.4	24.1	23.5	28.1	25.3
30-39	Count	173	177	183	187	196	205	215	223	233	250	255
	Rate	20.6	20.8	21.4	21.7	22.5	23.1	23.7	24.0	24.9	26.2	26.2
40-49	Count	196	204	214	208	186	185	206	195	184	197	227
	Rate	23.5	24.5	25.7	25.0	22.4	22.1	24.3	22.8	21.6	23.0	26.0
50-59	Count	255	239	224	245	229	216	243	226	229	217	247
	Rate	31.4	28.9	26.7	28.8	26.7	25.1	28.2	26.2	26.8	25.2	28.2
60-69	Count	150	135	185	173	199	190	198	186	171	196	206
	Rate	22.5	19.8	26.1	23.6	26.2	24.0	24.7	22.8	20.8	23.2	24.0
70-79	Count	71	89	111	110	121	119	154	150	122	145	196
	Rate	17.7	21.1	25.2	23.6	24.8	23.3	28.2	25.9	20.4	23.1	30.6
80+	Count	64	77	72	75	85	95	85	113	109	106	124
	Rate	27.6	32.3	28.9	29.2	31.9	34.1	30.1	38.4	36.3	33.8	38.9

Data Source: Death certificates

Table 9. Suicide Counts by Sex, Arizona, 2012-22

Sex		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Female	Count	263	268	300	309	295	309	290	315	297	298	303
	Rate	8.1	8.1	9.0	9.1	8.6	8.8	8.2	8.7	8.2	8.1	8.1
Male	Count	885	884	934	965	997	1005	1151	1108	1075	1187	1293
	Rate	27.4	27.0	28.2	28.7	29.4	29.0	32.7	31.0	30.2	32.8	35.1

Data Source: Death certificates

Table 10. Suicide Rates and Counts by Race/Ethnicity, Arizona, 2017-22

Race/Ethnicity		2017	2018	2019	2020	2021	2022
American Indian/Alaska Native	Count	85	117	90	91	127	108
	Rate	28.7	39.2	30.1	31.3	43.8	36.7
Asian/Pacific Islander	Count	23	19	21	21	29	28
	Rate	9.2	7.2	7.6	7.5	9.9	9.4
Black/African American	Count	33	55	46	50	52	57
	Rate	10.0	16.2	13.1	13.8	13.8	14.9
Hispanic/Latino	Count	180	186	215	206	225	271
	Rate	8.3	8.3	9.4	9.0	9.7	11.5
White	Count	973	1053	1036	997	1037	1124
	Rate	24.8	26.7	26.0	25.1	25.9	27.6

Data Source: Death certificates

Table 11. Suicide Rates and Counts by Veteran Status, Arizona, 2012-2022

Veteran Status		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Veteran	Count	261	252	264	251	279	250	255	263	244	271	303
	Rate	49.2	48.2	51.3	49.6	56.1	51.4	52.3	53.9	49.7	57.4	64.7
Non-Veteran	Count	860	874	936	967	955	1031	1169	1142	1113	1185	1258
	Rate	20.3	20.2	21.2	21.5	20.8	22.0	24.3	23.3	22.2	23.8	24.7

Data Source: Death certificates

Table 12. Veteran risk ratios by veteran status and age group, Arizona 2012-2022

Year	Group	RR	95% CI	P-value	Group	RR	95%CI	P-value	Group	RR	95% CI	P-value	Group	RR	98% CI	P-value	Group	RR	98%CI	P-value
2012	18-34	4.46	3.10, 6.41	<0.0000001	35-54	2.74	2.11, 3.55	<0.0000001	55-64	1.71	1.24, 2.36	0.0009063	65-74	3.67	2.44, 5.50	<0.0000001	75+	7.08	4.62, 10.83	<0.0000001
2013	18-34	3.34	2.19, 5.07	0.000000718	35-54	2.27	1.74, 2.96	<0.0000001	55-64	2.30	1.64, 3.23	0.000004039	65-74	4.10	2.81, 5.97	<0.0000001	75+	5.07	3.47, 7.42	<0.0000001
2014	18-34	4.02	2.77, 5.82	<0.0000001	35-54	2.61	2.00, 3.41	<0.0000001	55-64	1.69	1.19, 2.41	0.002755	65-74	2.83	2.03, 3.97	<0.0000001	75+	6.19	4.25, 9.03	<0.0000001
2015	18-34	3.58	2.44, 5.24	<0.0000001	35-54	2.22	1.66, 2.98	0.000000552	55-64	1.73	1.22, 2.47	0.00207	65-74	4.40	3.16, 6.11	<0.0000001	75+	4.69	3.22, 6.81	<0.0000001
2016	18-34	4.59	3.23, 6.51	<0.0000001	35-54	2.09	1.54, 2.83	0.000000785	55-64	2.25	1.61, 3.15	0.000006227	64-74	3.66	2.64, 5.07	<0.0000001	75+	7.47	5.21, 10.72	<0.0000001
2017	18-34	3.94	2.77, 5.60	<0.0000001	35-54	1.93	1.39, 2.67	0.0001555	55-64	2.00	1.41, 2.84	0.0001533	64-74	3.02	2.15, 4.24	<0.0000001	75+	5.14	3.71, 7.14	<0.0000001
2018	18-34	3.00	2.04, 4.41	0.000000663	35-54	1.95	1.44, 2.65	0.0000415	55-64	1.83	1.28, 2.61	0.0009213	64-74	2.82	2.08, 3.81	<0.0000001	75+	4.71	3.41, 6.52	<0.0000001
2019	18-34	2.27	1.48, 3.49	0.0004185	35-54	2.33	1.75, 3.10	0.000000107	55-64	1.87	1.30, 2.7	0.0008272	64-74	2.86	2.05, 4.00	<0.0000001	75+	4.86	3.64, 6.48	<0.0000001
2020	18-34	3.67	2.60, 5.19	<0.0000001	35-54	2.25	1.66, 3.06	0.000001147	55-64	2.15	1.51, 3.06	0.000047	64-74	1.94	1.31, 2.86	0.0008477	75+	4.87	3.60, 6.59	<0.0000001
2021	18-34	3.17	2.23, 4.49	<0.0000001	35-54	2.17	1.61, 2.92	0.000001941	55-64	2.64	1.89, 3.69	0.000000128	64-74	3.08	2.25, 4.22	<0.0000001	75+	5.20	3.81, 7.11	<0.0000001
2022	18-34	3.63	2.57, 5.14	<0.0000001	35-44	2.49	1.90, 3.27	<0.0000001	55-64	2.32	1.67, 3.21	0.0000001919	64-74	3.47	2.57, 4.67	<0.0000001	75+	4.17	3.16, 5.50	<0.0000001

Data Source: Death certificates