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Veteran Suicide in Colorado, Colorado Violent Death Reporting System, 2015-2019

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Introduction

Suicide is a major public health problem in the United States of America. Suicide affects all populations including members and veterans of the US Armed Forces. Historically, suicide rates among veterans were lower than the national average; however, in 2001 and since the suicide rates among veterans and armed forces have increased, and in 2008 suicide rates among veterans surpassed the national average.[1] Overall, the national unadjusted suicide rate for veterans from 2001 through 2019 increased by 35.9%.[5] However, the national veteran suicide rate and count has decreased in 2018 and 2019, and the suicide mortality rate for adults in the US has decreased in 2019.[5]

Colorado has had one of the highest suicide rates in the nation, being among the ten states with the highest suicide rates for the past eight consecutive years.[8] This report presents the most current available suicide mortality data among Colorado veterans of the US Armed Forces from the Colorado Department of Public Health and Environment (CDPHE). This report features demographics, injury specifics, contributing circumstances, and toxicology findings associated with suicide deaths. The purpose of this report is to increase awareness of suicide as an important public health issue, and to highlight the disparities in suicide risks between civilian and veteran populations. Additionally, this report can be used to inform ongoing prevention efforts and contribute to reducing suicide in Colorado.

Methods

Data for this report come from the Colorado Violent Death Reporting System (CoVDRS), as well as death certificate-based data from CDPHE's Vital Statistics Program in which CoVDRS is located. The CoVDRS is an enhanced public health surveillance system designed to obtain a complete census of all violent deaths occurring in Colorado.[2] A violent death includes any death by suicide, homicide, unintentional firearm discharge, legal intervention, as well as selected deaths of undetermined intent when the death may have been the result of violence. Colorado is one of 52 states and territories currently participating in the broader National Violent Death Reporting System (NVDRS), which is maintained and funded by the Centers for Disease Control and Prevention (CDC).[3] The NVDRS is the centralized database consisting of de-identified violent death data submitted by all participating states. All state-based NVDRS programs collect and input data from multiple sources including death certificates, coroner/medical examiner reports, and law enforcement investigations. These data include enhanced demographics, injury specifics, method of injury, contributing circumstances and toxicology findings.

This report focuses on suicide deaths among Colorado veterans from 2015 through 2019, with the latter representing the most current complete year of data from CoVDRS. Deaths are identified using the CoVDRS, which uses data

collected from death certificates, coroner/medical examiner investigations, autopsy reports, and law enforcement investigation reports. A full description of the data collection processes of the NVDRS is provided elsewhere.[4] Suicide deaths of non-Colorado residents, those of unknown veteran background, and decedents under the age of 18 were excluded from this report. It is important to note that Vital Statistics Program data (death certificates) include those Colorado residents who die out of state, whereas the CoVDRS data and results only includes those deaths that occur in Colorado.

Suicide deaths were described by year, age, sex, race and ethnicity, lethal means of suicide, and armed forces service status, and associated precipitating circumstances. For the purposes of this report, the term "veteran" refers to both active military members and those who are retired or non-active military. Sex of individuals is coded using what is documented on the death certificate which is captured using two categories: Female and male. Not included in this report is information on sexual orientation or transgender individuals. For this report, race and ethnicity (or Hispanic origin) is represented in five categories; White non-Hispanic, Hispanic (all races), Black or African American (Hispanic and non-Hispanic), American Indian or Alaska Native (Hispanic and non-Hispanic), and Asian or Pacific Islander (Hispanic and non-Hispanic). This is different than other published presentations of CoVDRS data, but necessary to ensure alignment of categories between the CoVDRS data for suicide deaths by race/ethnicity and the population estimates used for calculating population-based rates. Thus, Black/African American, Asian/Pacific Islander, and American Indian or Alaska Native include both Hispanic and non-Hispanic individuals in those race groups. Conversely, Hispanic will include all other race groups. The result is that race and ethnicity categories presented in this report are not mutually exclusive.

Decedents' counties of residence at the time of death were categorized as urban, rural, or frontier, according to the Colorado Office of Rural Health.[6] This geographic location is based on the decedent's county of residence, and not the county where death occurred. For this report, lethal means are reported as one of four possible categories: 'Firearm', 'hanging/asphyxiation/suffocation' (including oxygen displacement via gas), 'poisoning' (including overdoses from illicit and prescription drugs, other chemicals, as well as carbon monoxide), and 'other' (including jumping from a high place and sharp objects). Data presented on the specific toxicology findings focuses on assessing what drugs were present in the decedent at the time of death, and not necessarily the single drug causing death. A decedent can have multiple drugs in their system and be counted in each respective category; thus categories presented are not mutually exclusive.

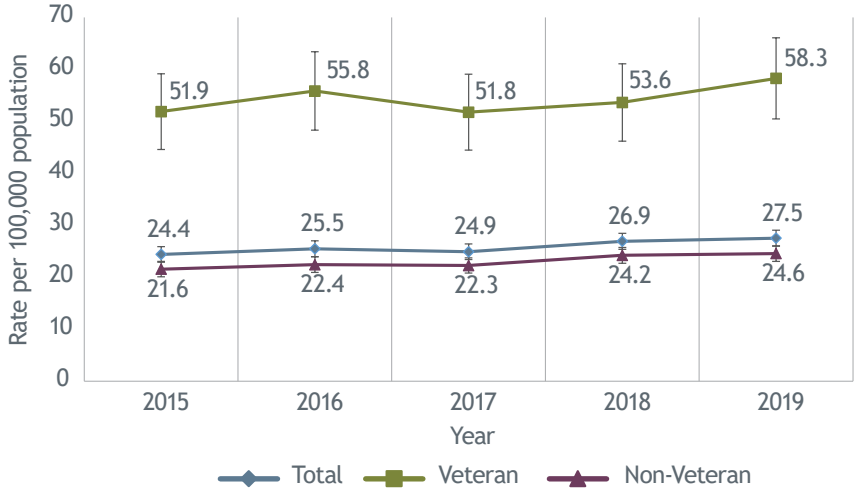
Suicide deaths were presented as frequencies, percentages, as well as unadjusted mortality rates per 100,000 population, with the ninety-five percent (95%) confidence intervals of rates. Population estimates for this report were obtained from the American Community Survey (ACS), U.S. Census Bureau, 2015-2019 5-Year American Community Survey.[7] When stated, 'statistically significant differences' or 'significant differences' between rates are determined by assessing the overlap (not statistically significant) or lack of overlap (statistically significant) of the 95% confidence intervals of the rates compared.

Results

From 2015 through 2019 the suicide rate within the veteran population was consistently over two-times higher than suicide rates within the non-veteran population. The combined 2015-2019 suicide rate for veterans was 54.3 per 100,000 veteran population ages 18 and over, and for non-veterans the rate was 23.0 per 100,000 non-veteran population ages 18 and over. Suicide rates among veterans remained relatively stable over

this five-year period: While some year-to-year increases and decreases were observed, none of these were statistically significant.

Figure 1: Suicide death rates (per 100,00 population) by year and veteran status, Colorado residents, 2015-2019.

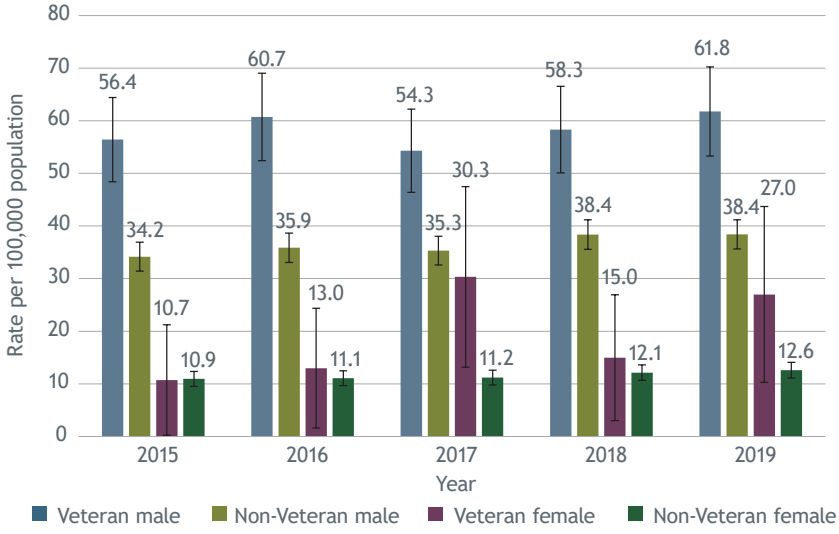


Error bars represent the lower and upper confidence limits of the 95% confidence interval of the suicide death rate.
Source: Colorado Violent Death Reporting System, Colorado Department of Public Health and Environment.

The total number of deaths among the veteran population between the years 2015-2019 was 1,011, with the highest number of deaths in one year occurring in 2019 with 214 deaths (Figure 1).

Figure 2 illustrates that the suicide rate is significantly higher among veteran males than non-veteran males every year. Across the five-year combined period, there was a statistically higher suicide rate among veteran males compared to non-veteran males (58.3 per 100,000 and 36.5 per 100,000, respectively). Between veteran and non-veteran females only one year had a statistically significant difference in suicide rate (in 2017). There is a statistically significant difference between veteran and non-veteran females when all the years are combined (19.2 per 100,000 compared to 11.6 per 100,000). Female veteran suicides averaged 7 deaths per year where veteran males averaged 195 per year over this time period.

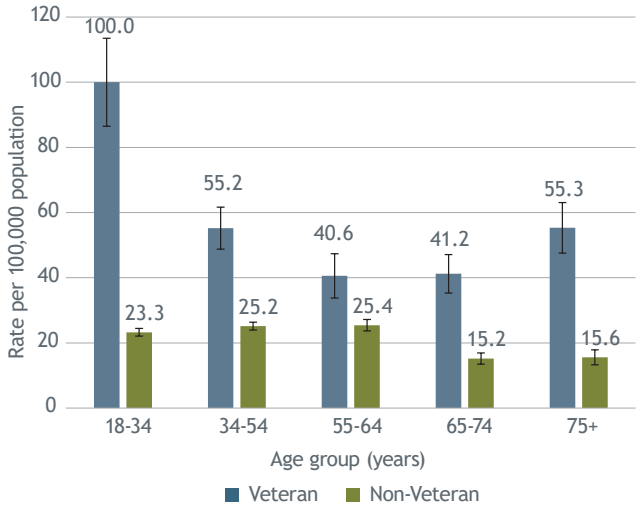
Figure 2: Suicide death rates (per 100,00 population) by year, sex, and veteran status, Colorado residents, 2015-2019.



Error bars represent the lower and upper confidence limits of the 95% confidence interval of the suicide death rate.
Source: Colorado Violent Death Reporting System, Colorado Department of Public Health and Environment.

Figure 3 presents the Colorado suicide rate by year, age group, and veteran status for 2015-2019. These data reveal that all age groups examined have a significantly higher suicide rate in the veteran population. The largest difference can be seen in the 18-34 age group where the suicide rate for veterans is over 4-times higher than non-veterans (100.0 per 100,000 population and 23.3 per 100,000, respectively). Among veterans the 34-54 year-old age group had the highest number of deaths total with 280 and the second highest was among 18-34 year-olds with 211 deaths.

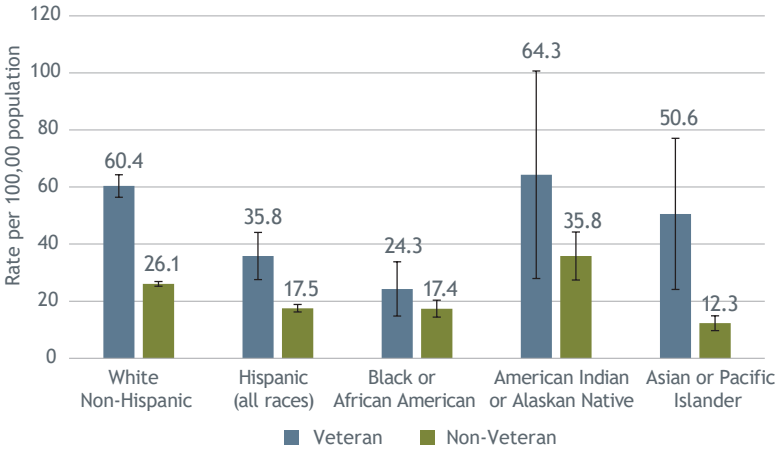
Figure 3: Suicide death rates (per 100,000 population) by year, age group, and veteran status, Colorado residents, 2015-2019.



Error bars represent the lower and upper confidence limits of the 95% confidence interval of the suicide death rate.
Source: Colorado Violent Death Reporting System, Colorado Department of Public Health and Environment.

Figure 4 presents rates of suicide deaths among veterans and non-veterans, by race and ethnicity (or Hispanic origin). In this report, the 'Hispanic' category includes Hispanic individuals of all races; additionally, Black or African American, American Indian or Alaska Native, and Asian or Pacific Islander includes Hispanic individuals of that race; thus, these categories are not mutually exclusive. When examining race/ethnicity and veteran status, three groups had significantly higher suicide rates in the veteran population compared to the respective non-veteran populations: White non-Hispanic (60.4 per 100,000 and 26.1 per 100,000), Hispanic (35.8 per 100,000 and 17.5 per 100,000), and Asian or Pacific Islander (50.6 per 100,000 and 12.3 per 100,000).

Figure 4: Suicide death rates (per 100,00 population) by race, ethnicity, and veteran status, Colorado residents, 2015-2019.



'Hispanic' includes those of all races identified as 'Hispanic', while Black or African American, American Indian or Alaska Native, and Asian or Pacific Islander include both Hispanic and non-Hispanic individuals of those races; thus these categories are not mutually exclusive.
Error bars represent the lower and upper confidence limits of the 95% confidence interval of the suicide death rate.
Source: Colorado Violent Death Reporting System, Colorado Department of Public Health and Environment.

Table 1 presents suicide rates by the decedent's geographic residence, classified as frontier, rural, and urban. These county designations are based principally on population size, population density, and proximity to urban areas. Urban counties are those counties that meet the Office of Management and Budget criteria for metropolitan counties. Frontier is a subset of rural, and are counties with a population density of six or fewer people per square mile.[14] Though residents of urban counties accounted for the greatest number of suicide deaths (859 among veterans and 3,304 among non-veterans between 2015-2019) the suicide rates were higher for both veteran and non-veteran suicides in both frontier and rural settings. However, the largest difference in suicide rate between veterans and non-veterans was in the rural setting where the suicide rate for veterans was 2.4 times higher in the veteran population.

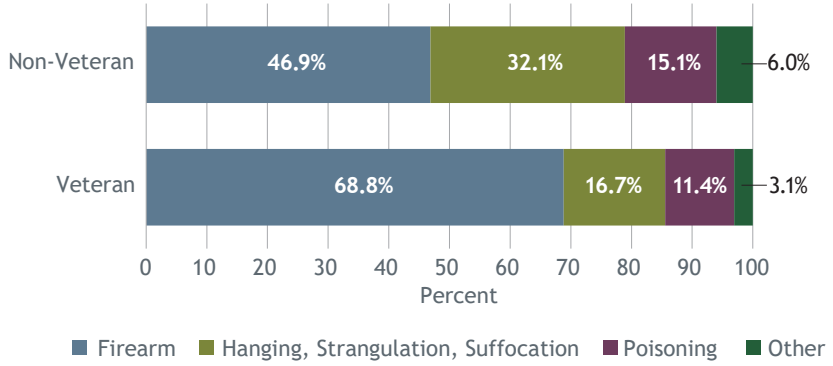
Table 1: Suicide death rates (per 100,000 population) by county of residence type and veteran status, Colorado residents, 2015-2019.

County of residence type	Veteran Status	Deaths	Rate	95% LCL	95% UCL
Frontier	Veteran	26	55.3	34.0	76.5
	Non-Veteran	142	30.6	25.5	35.6
Rural	Veteran	121	63.4	52.1	74.6
	Non-Veteran	556	26.5	24.3	28.7
Urban	Veteran	859	52.7	49.2	56.2
	Non-Veteran	3,804	22.2	21.5	22.9

95% LCL and UCL represent the lower and upper confidence limits of the 95% confidence interval of the suicide death rate.
Source: Colorado Violent Death Reporting System, Colorado Department of Public Health and Environment.

The most common method used to inflict fatal injury for suicide deaths among both veterans and non-veterans is by firearm (696 deaths and 2,270 deaths, respectively). However, Figure 5 demonstrates a higher proportion of suicide deaths by firearms among the veteran population compared to non-veterans (68.8% vs. 46.9%, respectively), with lower overall proportions across all other methods.

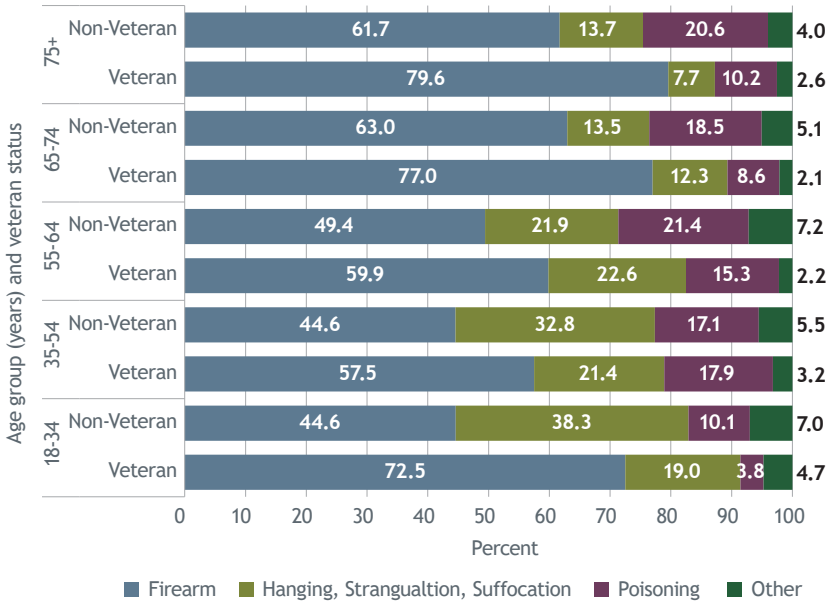
Figure 5: Suicide deaths in Colorado by method used to inflict the fatal injury and veteran status, Colorado residents, 2015-2019.



Source: Colorado Violent Death Reporting System, Colorado Department of Public Health and Environment.

Considering method used to inflict fatal injury between veterans and non-veteran by age group, the proportion of firearm-injury related suicide deaths among the veteran population was always greater than among the non-veteran population. The largest difference can be seen in the 18-34 age group where the non-veteran decedents used a firearm 44.6% of the time and veteran decedents used a firearm 72.5% of the time.

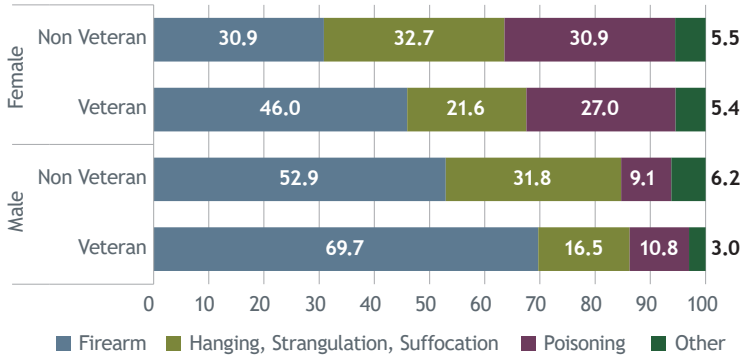
Figure 6: Suicide deaths in Colorado by method used to inflict the fatal injury and veteran status and age group, Colorado residents, 2015-2019.



Source: Colorado Violent Death Reporting System, Colorado Department of Public Health and Environment.

Overall, females over 18 years of age that die by suicide in Colorado are more likely to die by hanging, strangulation, or suffocation (32.7%); however female veterans who die by suicide are more likely to use a firearm as the method. This can be seen in Figure 7 where female veteran decedents used a firearm more than any other method (46.0%). Among both veteran and non-veteran males, use of firearm to inflict fatal injuries is the most comment method behind suicide death (69.7% and 52.9%, respectively).

Figure 7: Suicide deaths in Colorado by method used to inflict the fatal injury, veteran status and sex, Colorado residents, 2015-2019.



Source: Colorado Violent Death Reporting System, Colorado Department of Public Health and Environment.

There were differences between veteran and non-veteran populations when comparing prior mental health diagnoses. The most significant difference observed was among diagnoses of depression, for which the proportion among non-veteran suicide decedents was higher compared to veteran (42.7% and 34.9%, respectively). One notable difference where the proportion of prior mental health diagnoses among veterans was higher than non-veteran decedents was post-traumatic stress disorder (13.4% and 3.0%, respectively).

Table 2: Suicide deaths in Colorado by mental health diagnosis and veteran status, Colorado residents, 2015-2019.

	Veteran		Non-Veteran	
Mental Health Diagnosis	Percent	Count	Percent	Count
Suicides with 1+ known circumstance	96.5	976	97.4	4,715
Diagnosis of depression	34.9	341	42.7	2,011
Diagnosis of Anxiety	8.8	86	13.4	630
Diagnosis of Bipolar Disorder	5.2	51	10.1	474
Diagnosis of Schizophrenia	1.5	15	3.2	149
Diagnosis of Post-Traumatic Stress Disorder	13.4	131	3.0	141
Diagnosis of Attention Deficit Disorder	1.1	11	1.8	86
Diagnosis of Obsessive Compulsive Disorder	0.3	3	0.4	18

Source: Colorado Violent Death Reporting System, Colorado Department of Public Health and Environment.

Among both veteran and non-veteran suicide deaths, the most common known precipitating circumstance as reported by friends and family, or uncovered during investigation, was that the decedent was in a "current depressed mood" (50.6% and 52.9%, respectively). Between veteran and non-veteran suicide deaths, there was a higher percentage among veterans of "physical health problems" (50.0% and 31.0%, respectively), but lower percentages that were "ever treated for a mental health problem" (39.6% and 48.4%, respectively), had "intimate partner problems" (32.9% and 40.6%, respectively), and "history of previous suicide attempt(s)" (20.5% and 29.9%, respectively).

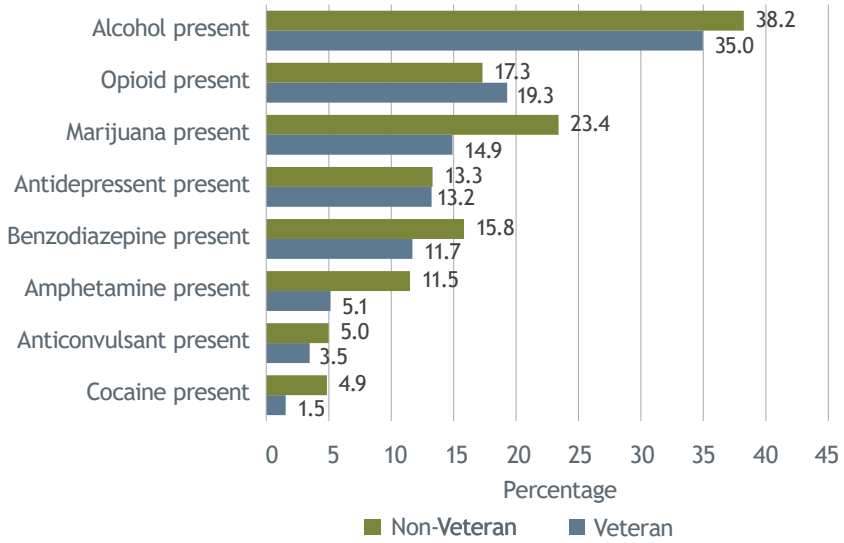
Table 3: Suicide deaths in Colorado by circumstances that contributed to death and veteran status, Colorado residents, 2015-2019.

	Veteran		Non-Veteran	
Known Circumstances	Count	%	Count	%
Suicides with 1+ known circumstance	976	96.5	4,715	97.4
Current depressed Mood	494	50.6	2,492	52.9
Physical health problem	488	50.0	1,462	31.0
Current mental health problem	483	49.5	2,656	56.3
History of suicidal thoughts and plans	461	47.2	2,439	51.7
Crisis in last two weeks	414	42.4	2,008	42.6
Ever treated for mental health problem	386	39.6	2,283	48.4
Left a suicide note	378	38.7	1,751	37.1
Intimate partner problem	321	32.9	1,915	40.6
Problem with alcohol	271	27.8	1,532	32.5
Disclosed intent to commit suicide	257	26.3	1,407	29.8
Current mental health treatment	251	25.7	1,480	31.4
History of previous suicide attempt	200	20.5	1,408	29.9
Family relationship problem	181	18.6	1,188	25.2
Death preceded by argument	170	17.4	1,114	23.6
Job problem	165	16.9	880	18.7
Contributing criminal legal problem	145	14.9	814	17.3
Financial problem	131	13.4	758	16.1
Problem with other substance	104	10.7	1,226	26.0
Recent non-suicide death of friend or family member	104	10.7	526	11.2

Source: Colorado Violent Death Reporting System, Colorado Department of Public Health and Environment.

Post-mortem toxicology results were available for 77.0% of veteran suicide decedents and 79.2% of non-veteran suicide decedents. The most common substance present for both veteran and non-veteran was alcohol (35.0% and 38.2%, respectively, based on suicide deaths with available toxicology results). A higher percentage of veteran decedents had opioids present compared to non-veteran decedents (19.3% and 17.3%, respectively). Other than opioids, all other substances presented in Figure 8 were more commonly identified among non-veteran suicide decedents than among veteran suicide decedents.

Figure 8: Suicides by toxicology at death and veteran status, Colorado Residents, 2015-2019.



Source: Colorado Violent Death Reporting System, Colorado Department of Public Health and Environment.

Discussion

Suicide rates for both veterans and non-veterans were persistently high through 2015-2019 in Colorado. The suicide rates were consistently higher among the veteran population than the non-veteran population. The increased suicide rates among veterans can be seen across all demographics, including breakouts by sex, age, race/ethnicity, and region of residence. Males, either veteran or non-veteran had a higher suicide rates than females which is consistent with historic data, both in Colorado and nationally. Many of the suicide rates among the veteran populations are over two times higher than the non-veteran populations for all demographics.

The leading method of injury among suicides in Coloradans over the age of 18 is firearm. However, the percentage of firearm use among veterans is higher than among non-veterans. The increase in firearm use among veterans can be seen both among males and females. Historically females are less likely to use a firearm but this changes when looking at veteran females, who have a higher percentage of firearm use. Similarly, when looking at age groups an increase in firearm use can been seen in all groups. Those ages 18-34 and 75+ have the largest difference in firearm use between veteran and non-veterans.

When looking at reported circumstances, mental health diagnoses, and toxicology there are some notable differences between veteran and non-veterans. Veterans have a lower percentage of diagnoses for all mental

health disorders, except post-traumatic stress disorder. Overall veteran suicide decedents were less likely than non-veterans to have been diagnosed with a mental health problem. While this could be due in part to military screening for mental health disorders when admitting people into the military, especially for schizophrenia and bipolar disorder, this may be due in part to differences in mental health care-seeking behavior among veterans compared to the general population.

Veterans have a higher percentage of a reported health problem, which includes chronic pain. Regarding toxicology results, veterans were more likely to have opioids present in their system at time of death, while all other toxicology results were lower among veterans. A possible explanation for this would be the higher percentage of physical health problems seen in veterans.

Suicide prevention for veterans continues to be a priority of Colorado's Office of Suicide Prevention and the Colorado Suicide Prevention Commission, the broader Colorado Department of Public Health and Environment, the Colorado Governor's Office and suicide prevention partners at the local, state and national level. The authors of this report are hopeful this information can continue to inform current and new suicide prevention efforts across Colorado. Additional information about specific veteran suicide prevention programs sponsored by the Colorado Department of Public Health and Environment can be found in the latest Annual Report of the Office of Suicide Prevention.[9]

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Suggested Citation

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9. Centers for Disease Control and Prevention. (2018). National Center for Health Statistics. Stats of the State of Colorado, 2017. Accessed at: https://www.cdc.gov/nchs/pressroom/states/colorado/colorado.htm

Additional Resources:

- ☐ Colorado Department of Public Health and Environment, Vital Statistics Program. https://www.colorado.gov/pacific/cdphe/vital-statistics-program.
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