



# *Violent Deaths in Colorado: Health Statistics Region 3, 2010-2014*

Center for Health and  
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Colorado Central Cancer  
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Colorado Violent Death  
Reporting System  
(CoVDRS)

Vital Statistics Program

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## Introduction

In the United States, approximately 55,000 people die annually as a result of violence<sup>1</sup>. Nationally, violent death is estimated to cost \$107 billion a year in medical care expenses and lost productivity, mentally and economically affecting millions of people<sup>2,3</sup>. With both suicide and homicide consistently ranking in the top four leading causes of death, especially in younger populations, violent death remains at the forefront as a public health concern<sup>1</sup>. Violent deaths often vary in both magnitude and nature, based on the geographic region and local community.

In an attempt to better understand this issue, violent deaths can be analyzed regionally using data from the Colorado Violent Death Reporting System (CoVDRS). The CoVDRS is an enhanced public health surveillance system designed to obtain a complete census of violent deaths in Colorado, and was implemented in 2004. Colorado is one of 42 states 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). The CoVDRS collects data from multiple sources including death certificates, coroner/medical examiner reports, and law enforcement investigations, which allows for greater case detail than death certificates alone.

This report focuses on profiling violent death in Colorado Health Statistics Region (HSR) 3. Included in HSR 3 is Douglas County. Douglas County is characterized as urban<sup>4</sup>. The report provides descriptive information using CoVDRS surveillance data from 2010 to 2014 and includes trends, and circumstances surrounding violent death in this region. The purpose of this report is to increase violent death awareness, and to gain a better understanding of regional violent death in HSR 3. The information presented in this report may be used to promote prevention and intervention efforts aimed at decreasing the impact of violent death in local and regional communities.

## Methods

Data for this report were obtained from the CoVDRS database and include homicide, suicide, and unintentional firearm deaths that occurred in Colorado among residents from 2010 to 2014, excluding legal intervention deaths. Deaths were selected for inclusion in the CoVDRS based on either the indication of violent death as the manner of death on the death certificate or International Classification of Disease, 10th Revision (ICD-10)-coded underlying cause of death as reported on the death certificate<sup>5</sup>. A full description of the data collection processes of the NVDRS is provided elsewhere<sup>6</sup>. Circumstances associated with most violent deaths were obtained through information contained in the death certificates, coroner/medical examiner investigation and autopsy reports; as well as the law enforcement investigation reports.

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Violent deaths were analyzed by health statistics region (HSR), lethal means, victim circumstances, and toxicology. For this report, lethal means of suicide are reported as: firearm, hanging, poisoning, and other (sharp instrument, fall, etc.) and lethal means of homicide are reported as: firearm, sharp instrument, blunt instrument, personal weapons, strangulation/suffocation, and other (poisoning, intentional neglect, etc.). Violent deaths are presented as counts, percentages or as a mortality rate (frequency of death per 100,000 population) with the ninety-five percent (95%) confidence interval.

Population estimates used in computing mortality rates are based on 2014 estimates from the State Demography Office, Colorado Department of Local Affairs. Age-adjusted suicide rates were calculated using the direct method and standardized according to the 2000 United States standard population. To calculate violent death rates and frequencies by geographic location within the state, counties in Colorado were categorized by Health Statistics Region (HSR), a method often used to examine regional differences for various health indicators within Colorado.

## Results

**Violent Death Rates** Table 1 presents the violent death counts and age-adjusted rates for both HSR 3 and Colorado as a whole. When comparing the rates in Table 1, the HSR 3 homicide rate is statistically significantly less than that of the Colorado rates. In HSR 3, the age-adjusted suicide rate for males is significantly greater than for females, 24.3 deaths per 100,000 population (n=174), as compared to 7.5 deaths per 100,000 population (n=59), respectively (data not shown).

**Table 1. Violent deaths and age-adjusted rates, Colorado and HSR 3 residents (2010-2014)**

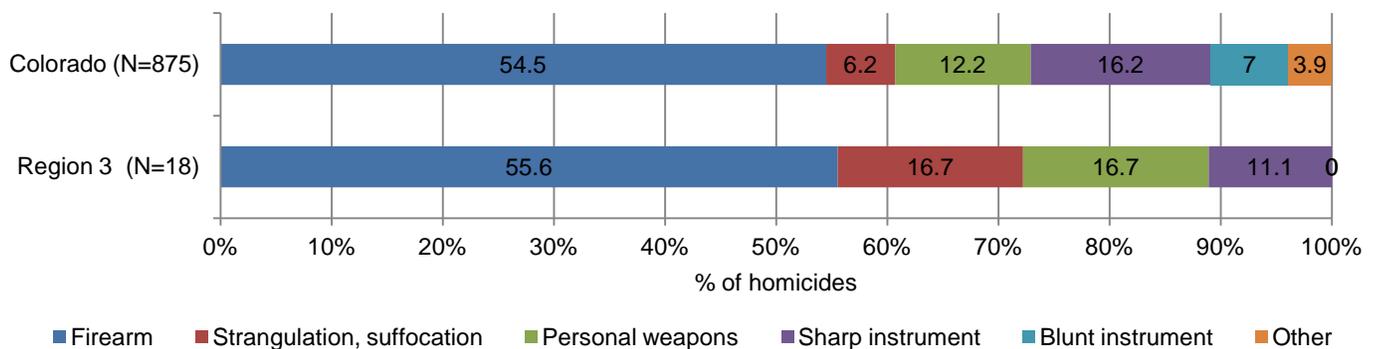
Violent Death Type	Colorado (Avg. Annual Population= 5,197,313)		HSR 3 (Avg. Annual Population= 299,849)	
	N	Age-Adjusted Rate (95% CI)	N	Age-Adjusted Rate (95% CI)
<b>Suicide</b>	4,811	18.1 (17.6-18.6)	233	15.6 (13.5-17.7)
<b>Homicide</b>	875	3.4 (3.2-3.6)	18	1.3 (0.7-1.9)
<b>Unintentional Firearm</b>	26	0.1 (0.07-0.2)	*	*

\*Counts of less than 3 are suppressed; rates are per 100,000 population.

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

**Homicide Methods** Figure 1 presents homicide deaths by method used to inflict the fatal injury, in HSR 3 and Colorado. The percentage of homicide deaths occurring by strangulation/suffocation in HSR 3 (16.7%) is more than double that of Colorado (6.2%). Additionally, no homicides by blunt instrument occurred in HSR 3.

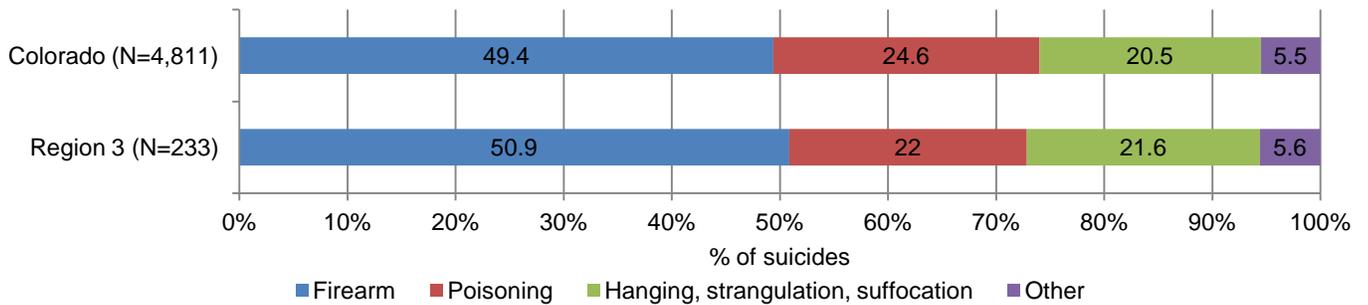
**Figure 1. Homicides by method of injury, Colorado and HSR 3 residents (2010-2014)**



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

**Suicide Methods** Figure 2 presents suicide deaths by method of injury used to inflict the fatal injury, in HSR 3 and Colorado. The figure reveals that in HSR 3, suicide victims died by similar means, when compared to the suicide victims of the whole state.

**Figure 2. Suicides by method of injury, Colorado and HSR 3 residents (2010-2014)**



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

**Victim Circumstances** Table 2 outlines the circumstances most frequently associated with suicide and homicide deaths in HSR 3 compared with all Colorado suicide and homicide deaths. The percentages are computed using only cases where at least one circumstance was known. In HSR 3, 99.1% of suicide cases and 66.7% of homicide cases had some sort of circumstance known about the incident per information pulled from coroner/medical examiner reports and law enforcement investigations. The highlighted cells represent the three most common circumstances for each population, which reveals differences between groups. The most frequent circumstance associated with HSR 3 suicide deaths was current mental health problem (60.6%), whereas in Colorado it was current depressed mood (56.2%). The most frequent circumstance associated with HSR1 homicide deaths was intimate partner violence (41.7%), whereas in Colorado it was that an argument preceded the death (40.2%).

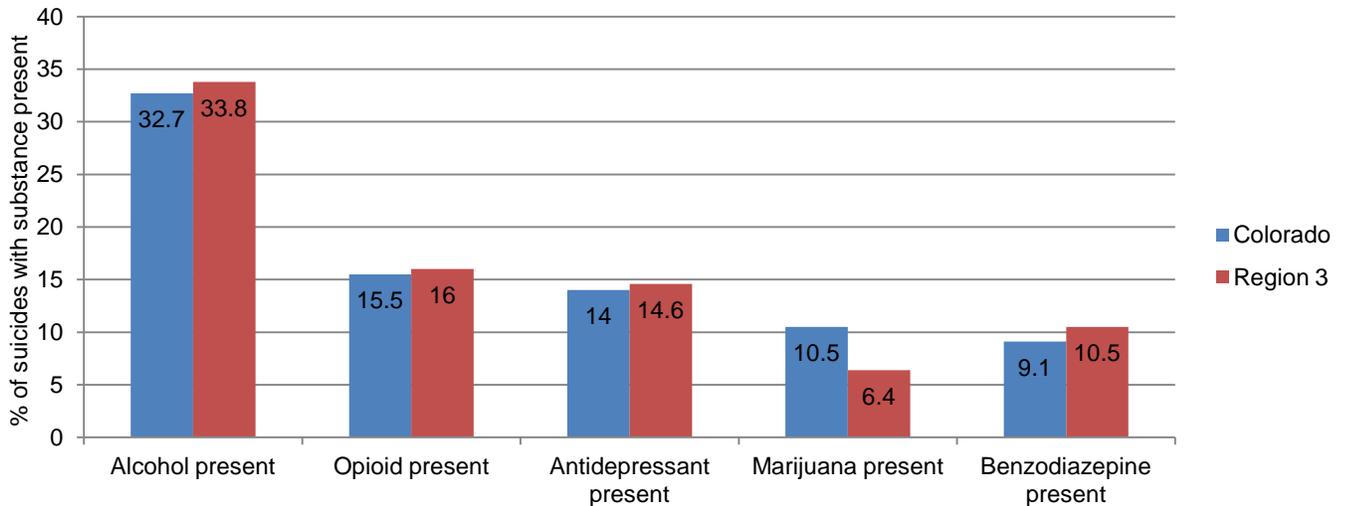
**Table 2. Violent deaths by circumstances, Colorado and HSR 3 residents (2010-2014)**

Suicide Circumstances	Colorado		HSR 3	
	n	% of suicides with known circumstance	n	% of suicides with known circumstance
<b>Suicides with 1+ known circumstance</b>	4,380	91	231	99.1
Current depressed mood	2,462	56.2	114	49.4
Current mental health problem	2,023	46.2	140	60.6
Ever treated for mental health problem	1,749	39.9	118	51.1
Left a suicide note	1,591	36.3	85	36.8
Intimate partner problem	1,530	34.9	105	45.5
Diagnosis of depression	1,514	34.6	107	46.3
Disclosed intent to commit suicide	1,488	34	78	33.8
Physical health problem	1,392	31.8	68	29.4
Current mental health treatment	1,374	31.4	93	40.3
History of previous suicide attempts	1,214	27.7	82	35.5
Homicide Circumstances	n	% of homicides with known circumstance	n	% of homicides with known circumstance
<b>Homicides with 1+ known circumstance</b>	632	72.2	12	66.7
Argument preceded violent death	254	40.2	4	33.3
Death precipitated by another crime	198	31.3	4	33.3
First crime in progress	154	24.4	3	25
Intimate partner violence	93	14.7	5	41.7
Victim of violence in the past 30 days	51	8.1	3	25

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

**Suicide Toxicology** Figure 3 presents documented toxicological results associated with HSR 3 and Colorado suicide deaths, that is, what substances were present in the victim’s system at the time of death. Among suicide deaths for which toxicology results were available (219, or 94% of all cases in HSR 3), alcohol (33.8%) was the most frequently identified substance, followed by opioid (16%), antidepressant (14.6%), and benzodiazepine (10.5%). Other substances noted were present in fewer than 10 percent of suicide deaths.

**Figure 3. Suicide deaths by presence of substances, Colorado and HSR3 residents (2010-2014)**



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

## Discussion

This analysis reveals the trends and characteristics of violent deaths in Health Statistics Region 3. The results of these analyses serve to inform local and state agencies for violence and injury prevention planning and intervention efforts by providing a better understanding of the populations at greatest risk for violent death. These results represent only a snapshot of the types of data the CoVDRS collects. For more information on the types of data collected by CoVDRS or specific data questions or needs contact the CoVDRS team (contact info on first page).

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## References

1. Parks SE, Johnson LL, McDaniel DD, Gladden M. Surveillance for violent deaths - National Violent Death Reporting System, 16 states, 2010. *MMWR Surveill Summ.* 2014 Jan 17;63(1):1-33. PubMed PMID: 24430165.
2. Centers for Disease Control and Prevention Fact Sheet. [http://www.cdc.gov/violenceprevention/pdf/nvdrs\\_factsheet-a.pdf](http://www.cdc.gov/violenceprevention/pdf/nvdrs_factsheet-a.pdf) (accessed July 2016).
3. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control: Understanding and Preventing Violence: Summary of Research Activities. <http://www.cdc.gov/violenceprevention/pdf/dvp-research-summary-a.pdf> (accessed July 2016).
4. County Designations, 2014. Colorado Rural Health Center. Accessed from <https://coruralhealth.org/wp-content/uploads/2013/10/2014.Colorado-County-Designations.pdf>
5. International Statistical Classification of Diseases and Related Health Problems 10th Revision. Accessed from <http://apps.who.int/classifications/icd10/browse/2010/en#/X60>
6. National Violent Death Reporting System Coding Manual. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. 2015 June 30. [http://www.cdc.gov/violenceprevention/nvdrs/coding\\_manual.html](http://www.cdc.gov/violenceprevention/nvdrs/coding_manual.html)