



COLORADO

Department of Public Health & Environment

Violent Deaths in Colorado: Health Statistics Region 1, 2010-2014

Center for Health and Environmental Data

Office of E-Health and Data

Registries and Vital Statistics Branch

Colorado Central Cancer Registry (CCCR)

Colorado Responds to Children With Special Needs (CRCSN)

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 violence¹. 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^{2,3}. With both suicide and homicide consistently ranking high among leading causes of death, especially in younger populations, violent death remains at the forefront as a public health concern¹. Occurrences of violent death vary geographically across Colorado, both in magnitude and in precipitating circumstances.

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 and medical examiner reports, and law enforcement investigations, which allow for greater case detail than death certificates alone.

This report focuses on describing violent deaths for Colorado Health Statistics Region (HSR) 1. Included in HSR 1 are Logan, Morgan, Phillips, Sedgwick, Washington, and Yuma counties. Logan, Morgan, and Phillips counties are categorized as rural, while Sedgwick, Washington, and Yuma counties are categorized as frontier⁴. The report provides descriptive information using CoVDRS surveillance data from 2010 to 2014 and includes trends, and circumstances surrounding violent death occurring in Colorado among residents of this region. The purpose of this report is to increase awareness of these events, and to gain a better understanding of violent deaths. The information presented in this report may be used to promote prevention and intervention efforts aimed at decreasing the impact of violent death at the local level.

Methods

Data for this report were obtained from the CoVDRS database and include homicide, suicide, and unintentional firearm deaths that occurred in Colorado among each region's 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 certificate⁵. A full description of the data collection processes of the NVDRS is provided elsewhere⁶. Circumstances associated with most violent deaths were obtained through coroner/medical examiner investigation and autopsy reports, as well as law enforcement investigation reports provided to CoVDRS.

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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 an age-adjusted mortality rate (a frequency of death per 100,000 population) with the ninety-five percent (95%) confidence intervals.

Population estimates used in computing mortality rates are based on 2014-based estimates from the Colorado 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 1 and Colorado as a whole. Between 2010 and 2014, the age-adjusted suicide rate increased almost twofold, from 11.0 per 100,000 (n=9) to 21.2 per 100,000 (n=15), respectively (data not shown). The age-adjusted homicide rate decreased during the study period, from 6.1 per 100,000 to 3.7 per 100,000 (data not shown).

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

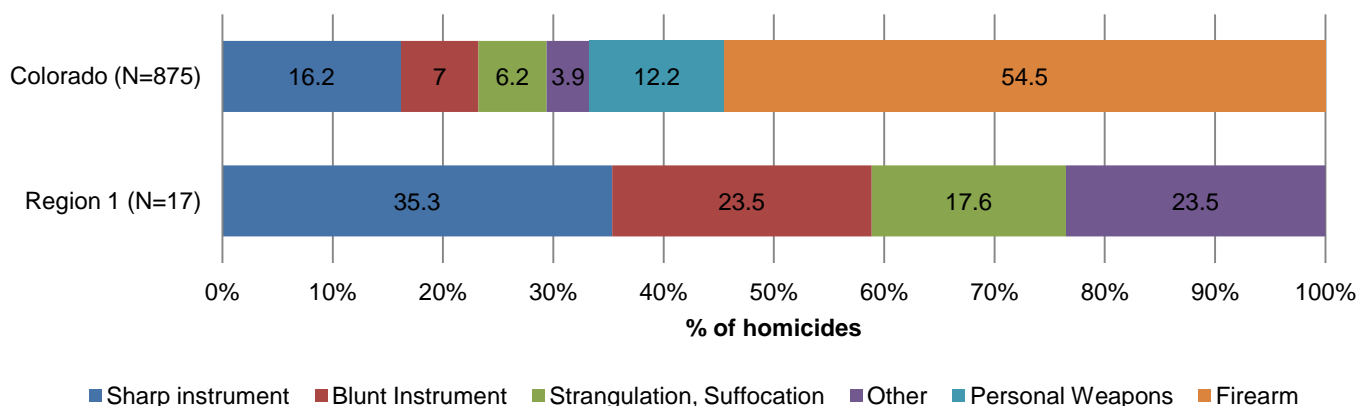
Violent Death Type	Colorado (Avg. Annual Population=5,197,313)		HSR 1 (Avg. Annual Population=72,031)	
	N	Age-Adjusted Rate (95% CI)	N	Age-Adjusted Rate (95% CI)
Suicide	4,811	18.1 (17.6-18.6)	60	16.2 (12.0-20.3)
Homicide	875	3.4 (3.2-3.6)	17	4.9 (2.5-7.3)
Unintentional Firearm	26	0.1 (0.07-0.2)	*	*

*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 1 and Colorado. The percentage of homicide deaths occurring by sharp instrument in HSR 1 (35.3%) is more than double that of Colorado (16.2%). Additionally, whereas more than half of all homicides in Colorado occurred by firearm during the study period, no homicides by firearm occurred in HSR 1.

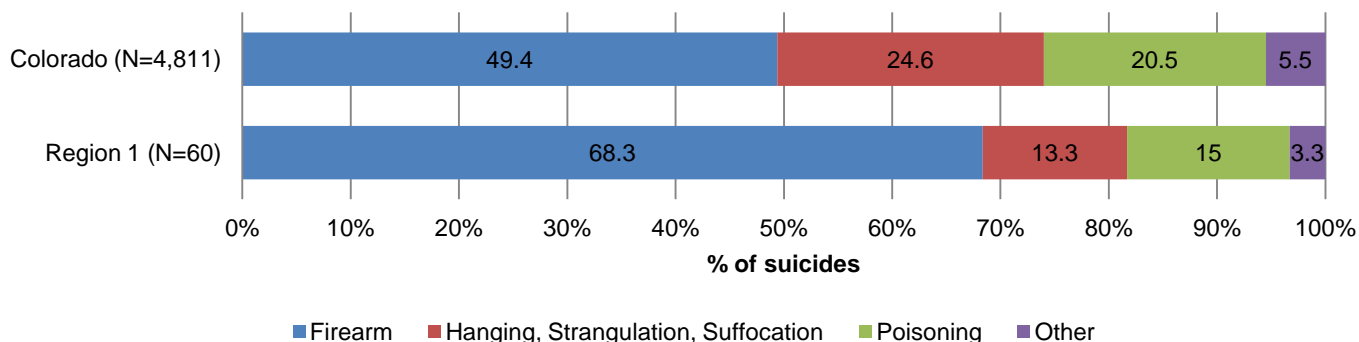
Figure 1. Homicides by method of injury, Colorado and HSR 1 residents (2010-2014)



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

Suicide Methods Figure 2 presents suicide deaths by method used to inflict the fatal injury, in HSR 1 and Colorado. Nearly 20% more suicides occurred by firearm in HSR 1 than in Colorado, and there were fewer hanging/suffocation and poisoning deaths in HSR 1 than in Colorado.

Figure 2. Suicides by method of injury, Colorado and HSR 1 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 1 compared with all Colorado suicide and homicide deaths. The percentages are computed using cases where at least one circumstance was known. 70% of suicides and 76.5% of homicides in HSR 1 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 1 suicide deaths was current mental health problem (35.7%), whereas in Colorado it was current depressed mood (56.2%). The most frequent circumstance associated with HSR 1 homicide deaths was that the death was precipitated by another crime (46.2%), whereas in Colorado it was that an argument preceded the death (40.2%). The most notable difference includes 50% fewer suicides in HSR 1 where the victim was in a current depressed mood prior to death, compared to all Colorado suicides.

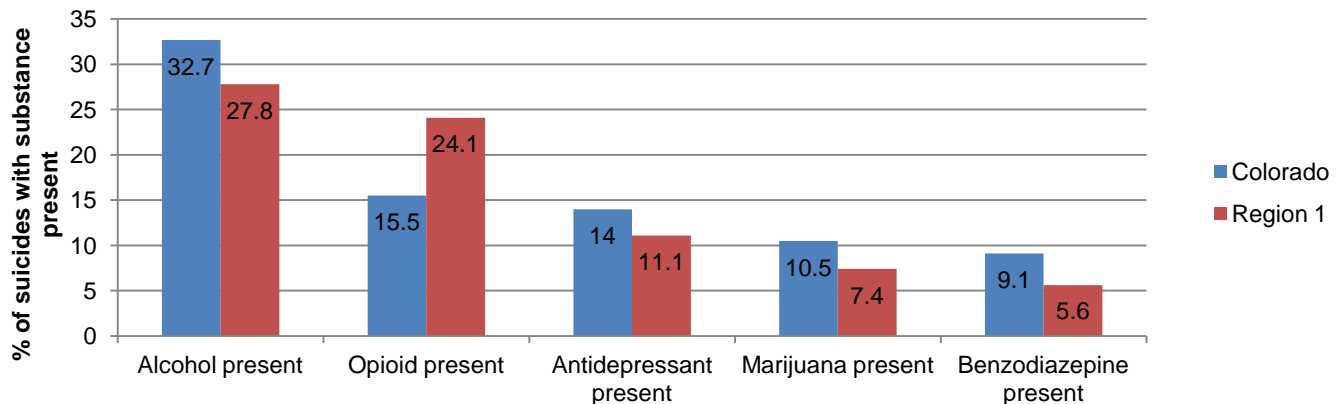
Table 2. Violent deaths by circumstances, Colorado and HSR 1 residents (2010-2014)

Suicide Circumstances	Colorado		HSR 1	
	n	% of suicides with known circumstance	n	% of suicides with known circumstance
Suicides with 1+ known circumstance	4,380	91	42	70
Current depressed mood	2,462	56.2	12	28.6
Current mental health problem	2,023	46.2	15	35.7
Ever treated for mental health problem	1,749	39.9	12	28.6
Left a suicide note	1,591	36.3	10	23.8
Intimate partner problem	1,530	34.9	11	26.2
Diagnosis of depression	1,514	34.6	9	21.4
Disclosed intent to commit suicide	1,488	34	6	14.3
Physical health problem	1,392	31.8	9	21.4
Current mental health treatment	1,374	31.4	10	23.8
History of previous suicide attempts	1,214	27.7	5	11.9
Homicide Circumstances	n	% of homicides with known circumstance	n	% of homicides with known circumstance
Homicides with 1+ known circumstance	632	72.2	13	76.5
Argument preceded violent death	254	40.2	3	23.1
Death precipitated by another crime	198	31.3	6	46.2
First crime in progress	154	24.4	3	23.1

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

Suicide Toxicology Figure 3 presents documented toxicological results associated with HSR 1 suicide deaths, that is, what substances were present in the victim’s system at the time of death. Among suicide deaths in HSR 1 for which toxicology results were available (54, or 90% of all cases), alcohol (27.8%) was the most frequently identified substance, followed by opioid (24.1%) and antidepressant (11.1%). Other substances noted were present in fewer than 10 percent of suicide deaths. Most notably, the presence of an opioid was almost 10% higher in HSR 1 suicide victims as compared to all Colorado suicide victims.

Figure 3. Suicide deaths by presence of substances, Colorado and HSR 1 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 1. 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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