CHILD FATALITY PREVENTION SYSTEM: FIREARM DEATH DATA, 2016 - 2020

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Introduction

The Child Fatality Prevention System (CFPS) is a statewide network that focuses on preventing child deaths. Housed at the Colorado Department of Public Health and Environment (CDPHE), CFPS consists of local review teams, a State Review Team, and the CFPS state support team at CDPHE. Local teams and the CFPS State Review Team include community members and field experts. These teams complete case reviews of infant, child, and youth deaths in Colorado to describe trends and patterns and create strategies to prevent future deaths. As part of the case review process, CFPS partners develop and share out recommendations for how to prevent child deaths annually.

The system reviews all deaths that occur in Colorado among infants, children, and youth under age 18. CFPS does not review deaths of Colorado residents that occur out of state. This is different from other reports of child death data and other Colorado government data sources. As a result, the data presented in this data brief might not match other statistics reported at both the state and national levels.

This data brief provides an overview of firearm death data from CFPS. Additional CFPS data are available at: www.cochildfatalityprevention.com/p/reports.html.

For purposes of this brief, ***inequities*** are defined as systemic, avoidable, and unjust factors that prevent people from reaching their highest level of health. ***Disparities*** are differences in health outcomes between people related to social or demographic factors such as race, ethnicity, gender, sexual orientation, or geographic region. Measuring disparities helps measure our progress toward achieving equity.[1,2]

The impact of policies and systems on child deaths

Generations of social, economic, and environmental inequities contribute to the deaths of infants, children, and youth.[3] People exposed to these factors (outlined in the table below) experience additional harm, resulting in higher rates of death. When interpreting the data, it is critical to not lose sight of these systemic, avoidable, and unjust factors. Researchers work towards understanding how geography, race, ethnicity, sexual orientation, and gender identity correlate with health. It is critical that data systems like CFPS identify and understand the life-long inequities that persist across groups in order to eliminate them. When limitations in the data system exist due to how data are collected, or because data are not collected, CFPS strives to provide additional context and research about how inequities impact child deaths. By changing policies and systems that create and perpetuate inequities, CFPS can reduce the number of child deaths that occur in Colorado. Examples of these inequities include, but are not limited to:

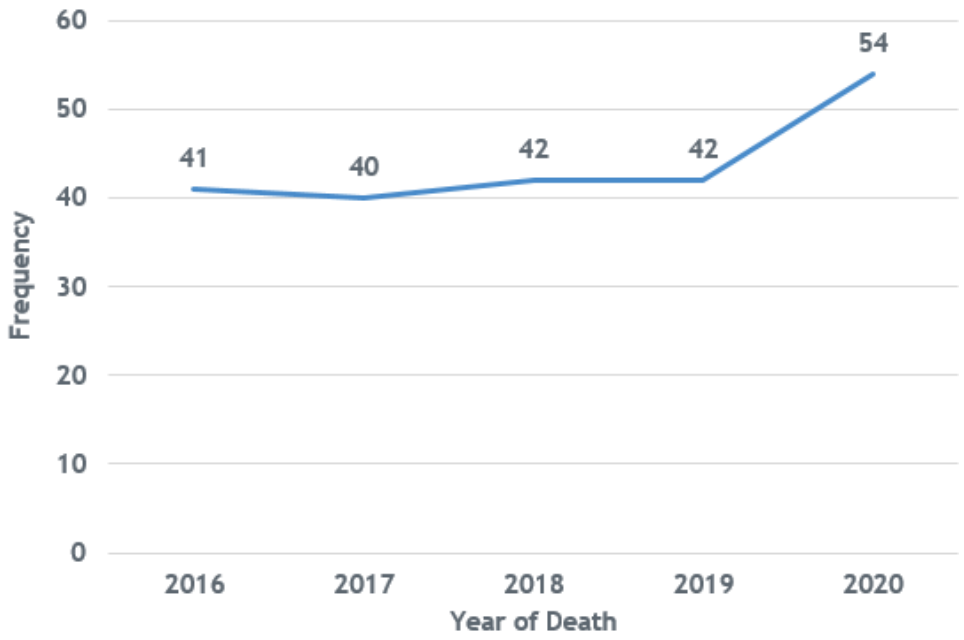
RURAL AND FRONTIER GEOGRAPHY	RACE AND ETHNICITY	SEXUAL ORIENTATION AND GENDER IDENTITY
Limited access to Level 1 trauma centers and mental and behavioral health services.[4] Increased stigma associated with mental illness and seeking help.[5] Longer response times by emergency medical services.[6] **→ These and other factors contribute to higher death rates in rural areas, including suicide[7] and passenger vehicle deaths.[8]**	Racism, discrimination, and historical trauma.[9,10] Limited access to high-quality education,[11] employment opportunities,[12] healthy foods,[13] culturally traditional foods,[14] and health care.[15] Chronic stress.[16] **→ These factors result in lasting health impacts for people of color that include infant mortality,[17] high rates of homicide and gun violence,[18] and increased motor vehicle deaths.[19]**	Discrimination, stigma, and bias.[20] Rejection from family, friends, and community.[21] Non-inclusive school curricula and anti-harassment policies.[22] Insufficient access to LGBTQ+-informed health care.[23] **→ This chronic social stress that LGBTQ+ children and youth experience influences health across the lifespan, including higher rates of suicide[24] and substance use.[25]**

Overview of Firearm Deaths

CFPS analyzes data on deaths involving firearms in Colorado, regardless of manner. From 2016-2020, 219 children and youth ages 0-17 died as a result of firearm injuries. Figure 1 shows that the number of yearly firearm deaths ranged from a low of 40 in 2017 to a high of 54 in 2020, averaging 44 deaths per year.

The rate of firearm deaths increased in 2020, although this difference was not statistically significant when comparing 2016 (3.2 per 100,000 population) to 2020 (4.2 per 100,000 population). The overall rate of firearm deaths from 2016-2020 was 3.4 per 100,000 population. Colorado's rate of firearm deaths was significantly higher than the national rate of firearm deaths over the same period (2.5 per 100,000 population).[26] Among firearm deaths in Colorado, suicide was the leading manner of death (56.6%, n=124), followed by homicide (39.7%, n=87), and accidental manner (2.7%, n=6).

Figure 1. Firearm deaths occurring among those under age 18 in Colorado by year, 2016-2020 (n=219)



The impact of the COVID-19 pandemic on firearm deaths.
Due to the changes that the COVID-19 pandemic brought to communities, child death review teams were asked to consider how the pandemic may have been a factor in deaths occurring after March 1, 2020. Teams considered questions including:

- Was this death an indirect result of the outbreak?;
- Did mandated or voluntary closures (i.e., schools, places of business, community centers, courts, social services) affect the outcome of this case?; and
- Was risk increased in this case due to social isolation of the child or the caregiver(s)?

CFPS teams ultimately determined that the COVID-19 pandemic indirectly contributed to 38.3% (n=18) of firearm deaths reviewed by CFPS that occurred between March 1, 2020 and December 31, 2020. CFPS teams will continue to answer these questions about the impact of the pandemic on child deaths for cases reviewed in 2021 and beyond.

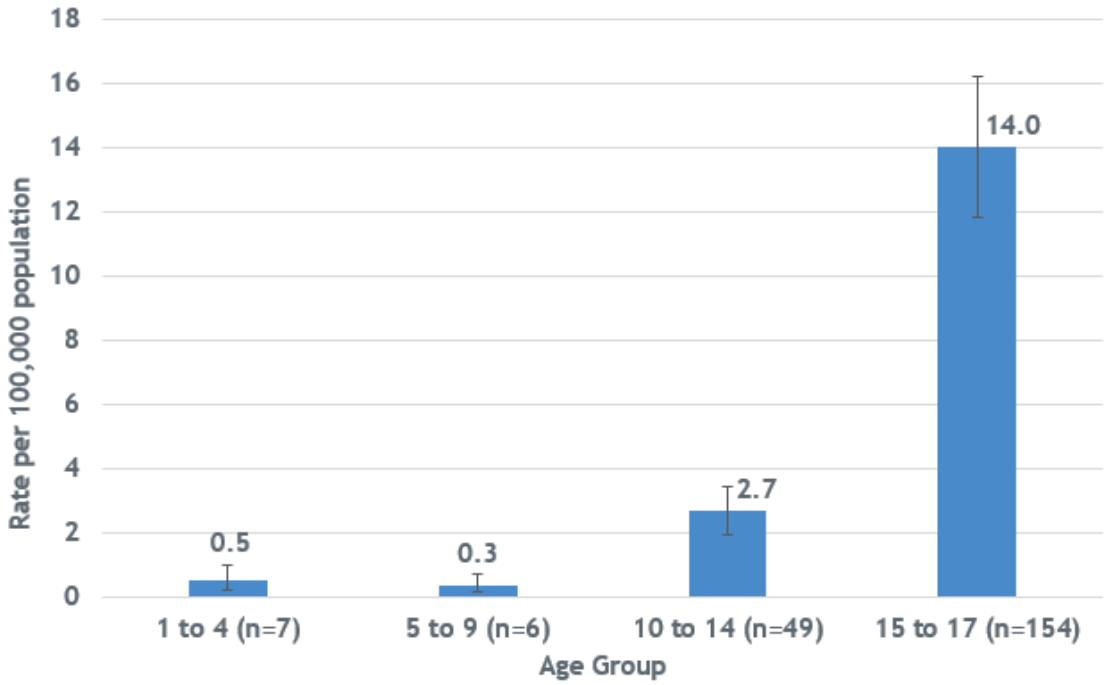
Demographic Characteristics

Age

Of the 219 firearm deaths, 70.8% (n=155) occurred among youth ages 15-17 and 22.8% (n=50) occurred among those ages 10-14. Of all firearm deaths among children and youth in Colorado, 93.6% (n=205) were among youth ages 10-17. Figure 2 shows that the rate of

firearm deaths was significantly higher among youth ages 15-17 (14.0 per 100,000 population) when compared to youth ages 10-14 (2.7 per 100,000 population).

Figure 2. Age-specific rates of firearm deaths occurring in Colorado among Colorado residents under age 18, 2016-2020 (n=216)



*Error bars represent 95% confidence limits for rates.

Sex

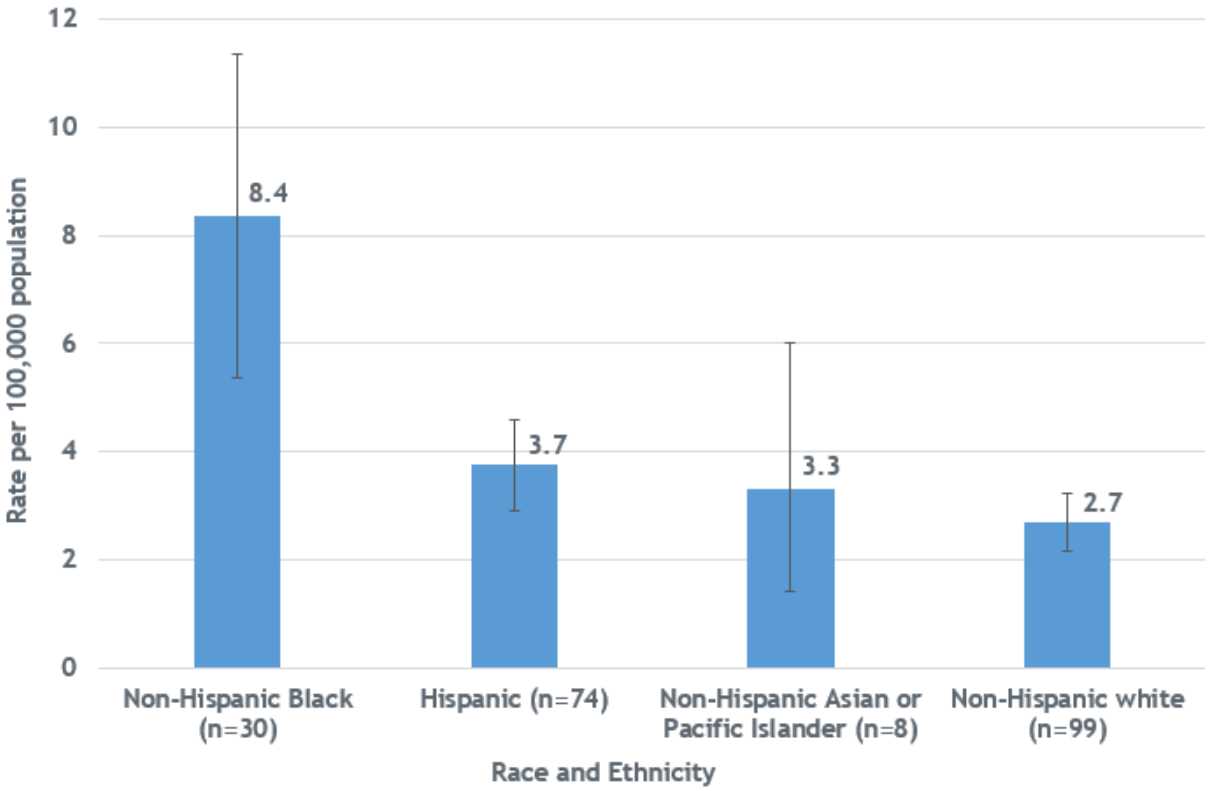
Of the 219 firearm deaths, 84.0% (n=184) of those who died were male, with the rate of firearm deaths significantly higher for males (5.6 per 100,000 population) than for females (1.1 per 100,000 population).

Race and Ethnicity

A note about terminology: Hispanic ethnicity as collected on the Colorado death certificate includes those that identify as Mexican, Mexican American, Chicano, Chicana, Puerto Rican, Dominican, Cuban, Central American, South American, Latin American, Spanish, and other Latin or Hispanic descent.[27] Additionally, "Latinx" and "Chicanx" are increasingly used gender inclusive terms, respecting those with a non-binary gender identity.[28,29] To ensure clarity, this report uses "Hispanic" throughout the data section to reflect how CFPS data are collected from the death certificate and to align with terminology used in cited literature and research.[30]

Between 2016 and 2020, the majority of children and youth who died by firearm were non-Hispanic white (46.6%, n=102), 33.8% (n=74) were of Hispanic origin, 13.7% (n=30) were non-Hispanic Black, and 3.7% (n=8) were non-Hispanic Asian or Pacific Islander.
The rate of firearm deaths was significantly higher among non-Hispanic Black children and youth in Colorado (8.4 per 100,000 population) compared to non-Hispanic white (2.7 per 100,000 population) and Hispanic (3.7 per 100,000 population) (Figure 3).

Figure 3. Rates of firearm deaths occurring in Colorado among Colorado residents under age 18 by race and ethnicity, 2016-2020 (n=216)



*Error bars represent 95% confidence limits for rates.

When narrowed down specifically to homicide deaths (not due to child maltreatment) by firearm (n=67), the significant difference across racial and ethnic groups widens. Consistent with national trends,[31] the rate of homicide deaths by firearm among non-Hispanic Black children and youth was 17.5 times higher (4.7 per 100,000 population) than for non-Hispanic whites (0.3 per 100,000 population). These differences exist because of community-level inequities.

Racialized residential segregation is a social determinant of the racial disparities observed in firearm deaths, and is largely driven by discriminatory federal, state, and local policies, such as redlining, that create unjust geographic divisions among racial and ethnic groups.[32] Racial segregation leads to neighborhood disadvantage by concentrating neighborhood poverty,

creating barriers to and fewer opportunities for a healthy lifestyle, limiting access to health services, and increasing housing and food insecurity.[33] The consequences of residential segregation resulting from historical practices like redlining continue to reverberate throughout communities of color today. In the U.S., Black families are likely to live in communities that are highly segregated with limited access to basic needs assistance, mental health and substance abuse treatment, and opportunity for employment.[34] Data show 17.9% of AI/AN, 16.8% of Black, and 14.8% of Hispanic Coloradoans live below the poverty level, compared to 7.7% of non-Hispanic white Coloradans.[35]

In addition to harming economic opportunity, this structural injustice may reduce a community's ability to achieve shared goals of keeping residents safe and neighborhoods free of crime and violence.[36,37] As a result, communities may be less able to monitor children's play groups, intervene to support youth to prevent concerns like truancy, and confront those who are disturbing public spaces.[38] Racial segregation concentrates poverty in certain areas and isolates residents from key resources. This results in a less united neighborhood and makes it less likely for residents to intervene on behalf of the good of the community. Having poor neighborhood support and cohesion fosters a social norm in which violence is a part of daily life.[39]

Therefore, the disparity observed for firearm deaths may be partly explained by racialized residential segregation and living in high poverty areas. This is continually perpetuated by social policies that maintain segregation.[40,41] It is critical to identify, understand, and eradicate the life-long inequities that persist across racial groups and that contribute to these differences in firearm death rates.

Geography

To calculate statistics by geographic location within the state, counties in Colorado are categorized as urban, rural, or frontier, according to standards applied by the Colorado Rural Health Center.[42] All counties that are not designated as parts of Metropolitan Areas are considered rural. Frontier counties are further classified as those with a population density of six or fewer persons per square mile. It is worth noting that these county designations are limited in that they do not account for the geographic nuance experienced by several large counties in Colorado (e.g., Arapahoe, El Paso, Larimer, Mesa) that have both populous urban centers and broad rural areas.

Between 2016 and 2020, the majority of Colorado residents under age 18 who died by firearm in Colorado resided in an urban county (87.0%, n=188), while 9.7% (n=21) lived in a rural county, and 3.3% (n=7) lived in a frontier county. The rate of firearm deaths among children and youth living in a frontier county (5.2 per 100,000 population) was 1.5 times higher than those living in an urban (3.4 per 100,000 population). Readers should interpret this data with caution, as the frontier rate represents very few deaths, decreasing the stability of the rate. These geographic disparities must also be considered by manner of death. National research

finds greater firearm homicide rates in urban areas are in contrast to greater firearm suicide and unintentional firearm death rates in rural areas.[43]

Firearm suicide by geography

In Colorado, the rate of firearm suicide deaths among children and youth living in a frontier county (4.9 per 100,000 population) was higher than those living in an urban (2.5 per 100,000 population) and rural county (3.8 per 100,000 population). This data is consistent with national data showing higher firearm suicide rates in the most rural areas.[44] Possible explanations for these disparities include limited availability and accessibility of mental and behavioral health services, longer travel distances to seek health care,[45] lower family income,[46] and increased stigma related to help-seeking and mental health.[47] Rural and frontier communities also have greater access to firearms, as owning and using firearms is more common among rural residents and is also a large part of the culture.[48] Rural residents often grow up around firearms, have firearms in their homes, and use them for activities such as hunting, agriculture, and recreation.[49] Additional CFPS data on suicide are available at: www.cochildfatalityprevention.com/p/reports.html.

Firearm homicide by geography

When examining firearm homicide deaths among Colorado residents under age 18, 95.5% (n=63) occur among young people that reside in an urban county. Since the counts are so low in frontier and rural counties, those rates cannot be shared publicly. However, the rate of firearm homicide for young people living in an urban county is 1.1 per 100,000 population, which matches the overall state rate of firearm homicide. This data is consistent with national data showing higher firearm homicide rates in our most urban areas.[50] One potential factor contributing to this geographic disparity in firearm homicide deaths is the racialized residential segregation occurring in urban areas discussed previously. Evidence suggests that this structural, community-level inequity harms economic opportunity and contributes to the higher level of gun violence and crime experienced in urban, racially segregated areas.[51,52] Additional CFPS data on homicide are available at: www.cochildfatalityprevention.com/p/reports.html.

Circumstances of Firearm Deaths

Mass Shootings

The National Center for Fatality Review and Prevention's Case Reporting System does allow for the collection of information regarding mass shooting fatalities. Although heartbreaking and deeply felt by the communities in which they occur, it is important to note that mass shooting deaths for infants, children, and youth under age 18 in Colorado are infrequent. These deaths are so rare that they do not meet privacy criteria for sharing data publicly.

Figure 4 displays the types of firearms used in firearm deaths occurring in Colorado. The weapon type most commonly associated with these deaths was a handgun (78.0%, n=149), followed by shotguns (9.1%, n=20), hunting rifles (5.5%, n=12), and assault rifles (1.8%, n=4). Information about weapon type was missing or unknown for 14.6% (n=32) of these deaths.

Figure 4. Type of firearm for firearm deaths occurring among those under age 18 in Colorado, 2016-2020 (n=219)

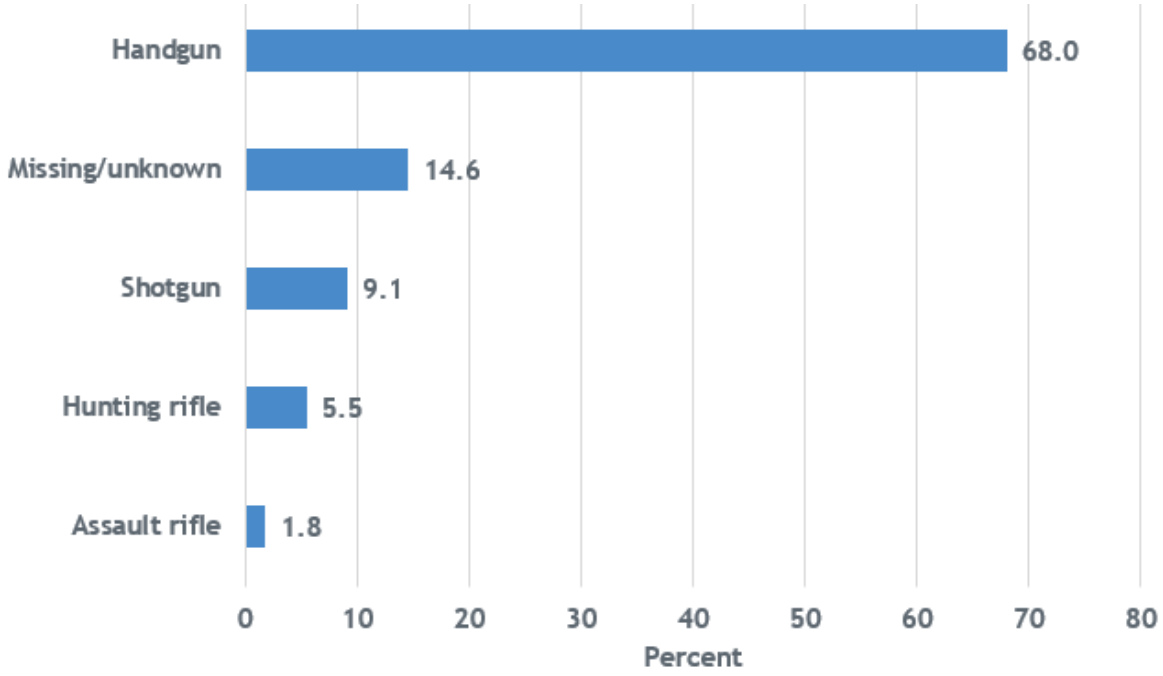


Figure 5 includes information about where and how the firearms used to inflict deadly injuries were stored. Current best practice for safe firearm storage includes storing the firearm locked and unloaded, and storing ammunition locked and in a separate location from the firearm.[53] Only 7.3% (n=16) of firearms involved in the death of a child or youth in Colorado were known to have been stored in a locked storage location. Firearms were stored unlocked 48.4% (n=106) of the time. This information was missing or unknown for 44.3% (n=97) of these firearms. Firearm owners stored firearms unloaded 12.3% (n=27) of the time. This information was missing or unknown 59.8% (n=131) of the time.

The cause for such high numbers of unknown and missing firearm information is not clear. For firearm homicide deaths, this unknown information is most often due to the case being an open court case at the time of review. Because of this, investigative records are not available for teams to determine the circumstances surrounding the death, including weapon storage. For firearm suicide deaths, the unknown and missing information may also be because death scene investigators and child fatality review team members are not discussing firearm storage as part of death investigations and case reviews. The CFPS 2022 Legislative Report includes a

data quality improvement recommendation to encourage and incentivize law enforcement agencies and coroner offices in Colorado to use the Suicide Death Scene Investigation Form (www.colorado.gov/cdphe/suicide-investigation-form), which would improve the collection of firearm information for suicide deaths.

Figure 5. Firearm storage status for firearm deaths occurring among those under age 18 in Colorado, 2016-2020 (n=219)

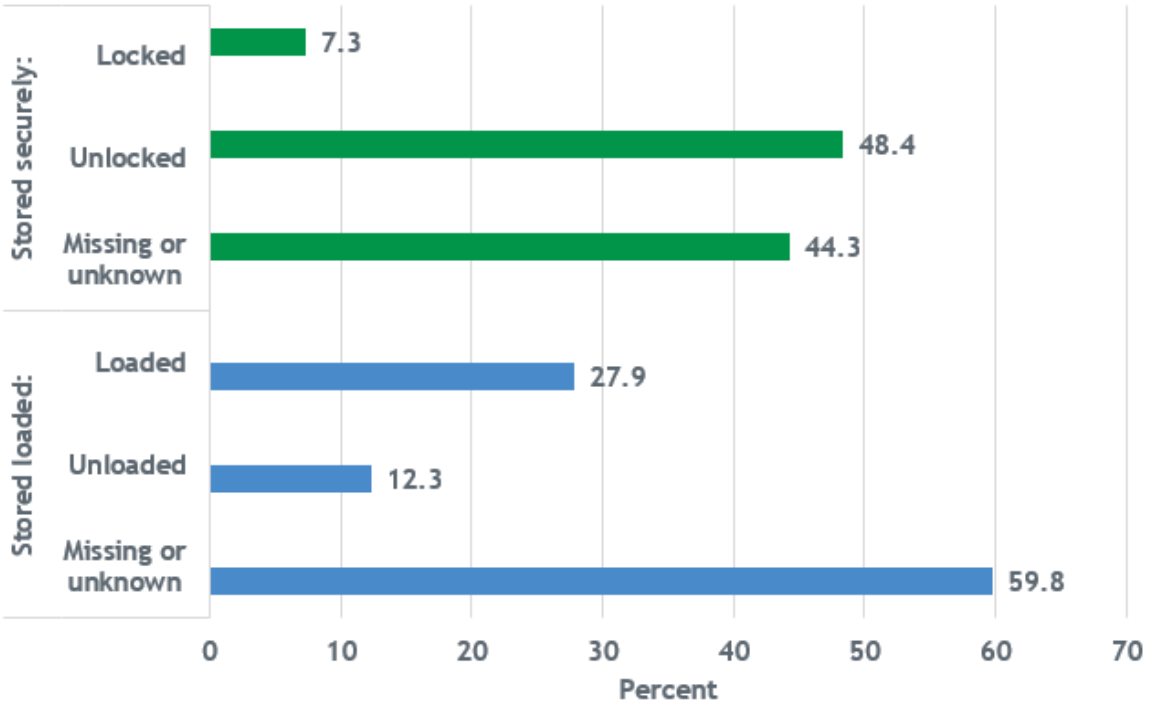
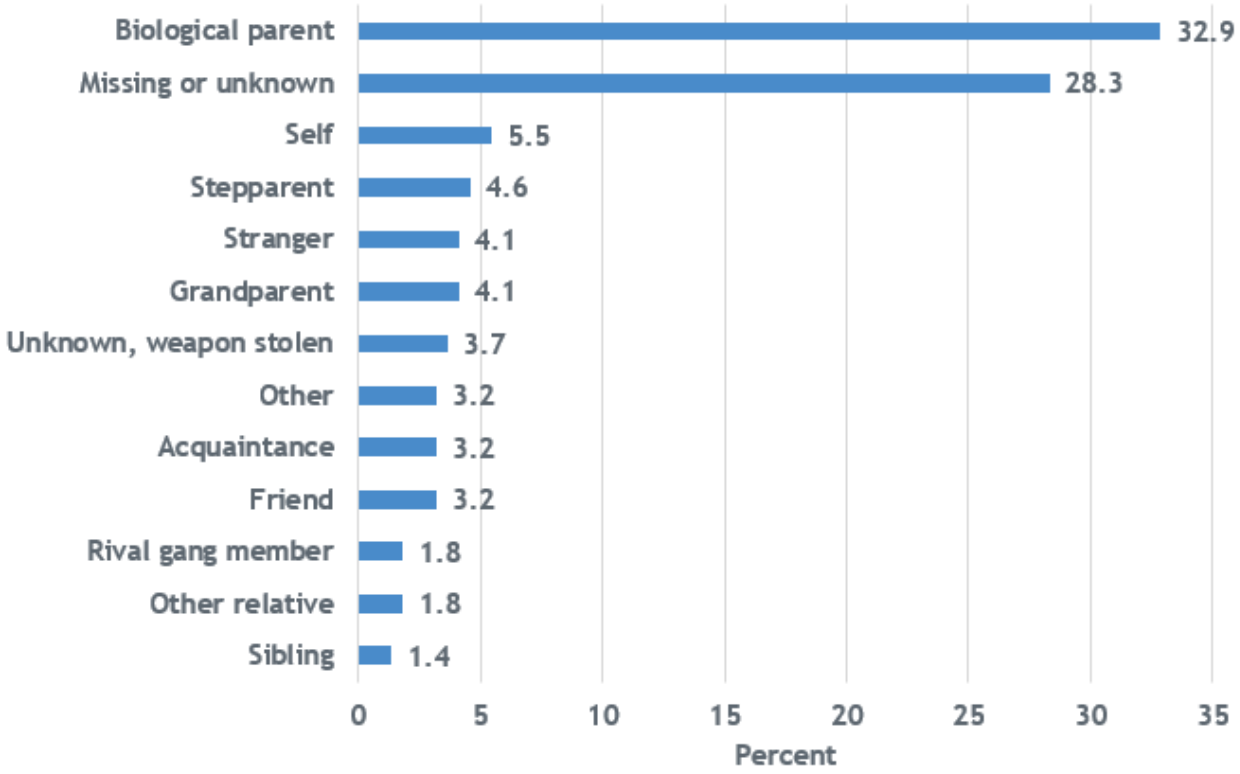


Figure 6 demonstrates ownership of firearms involved in firearm deaths in Colorado by relationship to the child or youth who died. Biological parents were most commonly the reported owners of the firearm involved in the death (32.9%, n=72), followed by the child or young person themselves (5.5%, n=12), stepparents (4.6%, n=10), and strangers (4.1%, n=9). This information was missing or unknown for 28.3% (n=62) of the deaths, for similar reasons stated above. Approximately 49.8% (n=109) of the firearm owners were male, 15.1% (n=33) were female, and information about the sex of the owner was missing or unknown for 35.2% (n=77) of these deaths.

Figure 6. Firearm ownership for firearm deaths occurring among those under age 18 in Colorado, 2016-2020 (n=219)



Conclusion

From 2016 to 2020, firearm deaths were the fifth leading cause of death reviewed by CFPS among those under age 18 in Colorado. Among firearm deaths, suicide was the leading manner of death, followed by homicide, and accidental manner. The highest rates of firearm death were observed among youth ages 15-17 and among non-Hispanic Black children and youth. Upstream prevention strategies that address social and structural inequities can reduce firearm deaths among infants, children, and youth. To learn more about the prevention strategies recommended by CFPS, view the 2022 Legislative Report (www.cochildfatalityprevention.com/p/reports.html). To learn even more about the inequities that contribute to child deaths, view the CFPS report "*The Role of Policies and Systems in Child Deaths in Colorado*."

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