

CHILD FATALITY PREVENTION SYSTEM: MOTOR VEHICLE AND OTHER TRANSPORTATION DEATH DATA, 2014 - 2018



COLORADO
Department of Public
Health & Environment

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 43 local review teams, a 46-member State Review Team, and the CFPS state support team at CDPHE. Local teams 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. The CFPS State Review Team develops recommendations for the legislature on how to prevent child deaths in an annual legislative report.

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 motor vehicle and other transportation death data from CFPS. Additional CFPS data is available at:

www.cochildfatalityprevention.com/p/reports.html.

The impact of policies and systems on child deaths

Generations of social, economic, and environmental inequities contribute to some families losing infants, children, and youth.¹ When interpreting the data, it is critical to not lose sight of these systemic, avoidable, and unjust factors. These factors perpetuate the disparities observed in child deaths in Colorado. 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, understand, and eliminate life-long inequities that persist across groups. When limitations in the data system exist due to how data is collected, or because data is 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
<p>Limited access to Level 1 trauma centers and mental and behavioral health services.²</p> <p>Increased stigma associated with mental illness and seeking help.³</p> <p>Longer response times by emergency medical services.⁴</p> <p>→ These and other factors contribute to higher death rates in rural areas, including suicide⁵ and passenger vehicle deaths.⁶</p>	<p>Historical trauma, racism, and discrimination.^{7,8}</p> <p>Limited access to high-quality education,⁹ employment opportunities,¹⁰ healthy foods,¹¹ culturally traditional foods,¹² and health care.¹³</p> <p>Chronic stress.¹⁴</p> <p>→ These factors result in lasting health impacts for people of color that include infant mortality,¹⁵ high rates of homicide and gun violence,¹⁶ and increased motor vehicle deaths.¹⁷</p>	<p>Discrimination, stigma, and bias.¹⁸</p> <p>Rejection from family, friends, and community.¹⁹</p> <p>Non-inclusive school curricula and anti-harassment policies.²⁰</p> <p>Insufficient access to LGBTQ+-informed health care.²¹</p> <p>→ This chronic social stress that LGBTQ+ children and youth experience influences health across the lifespan, including higher rates of suicide²² and substance use.²³</p>

Overview of Motor Vehicle and Other Transportation Deaths

From 2014 through 2018, there were 233 motor vehicle and other transportation deaths among infants, children, and youth ages 0-17 in Colorado. Motor vehicle and other transportation deaths include deaths of drivers and passengers of motor vehicles; bicyclists and pedestrians struck by a motor vehicle; and motorcycle, airplane, all-terrain vehicle (ATV) and farm equipment crashes or events. Figure 1 displays the total number of motor vehicle and other transportation deaths occurring from 2014-2018. The number of deaths ranged from a low of 37 in 2015 to a high of 59 in 2017 and averaged about 47 deaths per year for the five-year period.

Figure 1. Motor vehicle and other transportation deaths occurring among those under age 18 in Colorado by year, 2014-2018 (n=233)

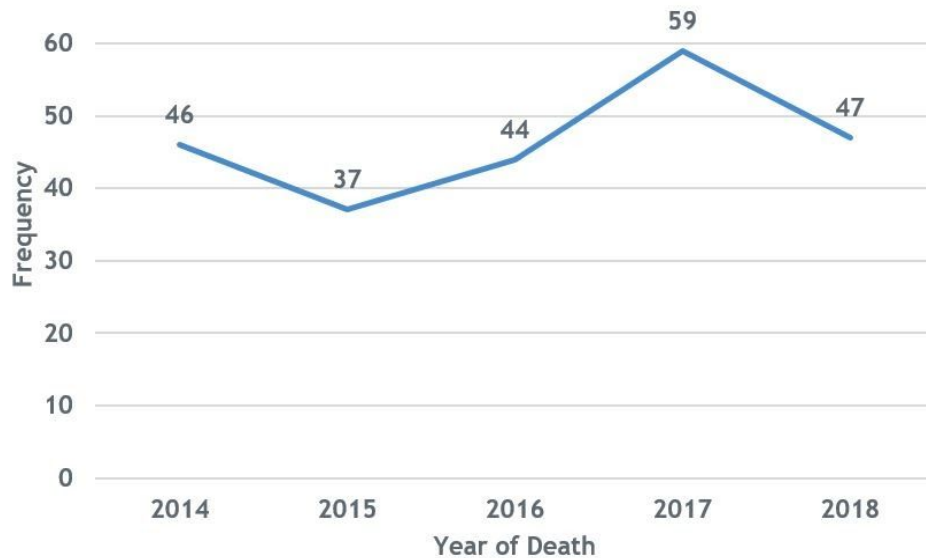
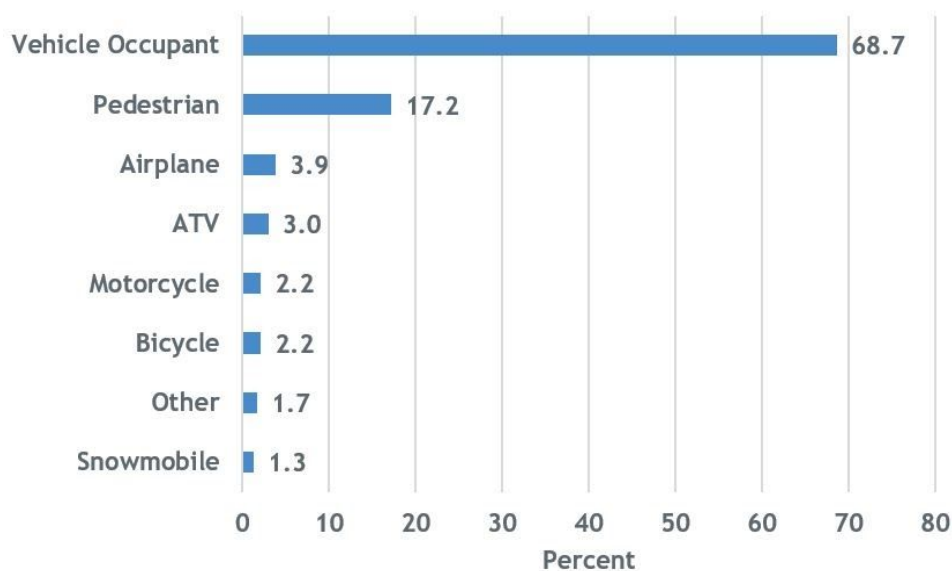


Figure 2 demonstrates that 68.7% (n=160) of children or youth who died in motor vehicle and other transportation deaths were occupants of passenger vehicles, 17.2% (n=40) were pedestrians, 3.9% (n=9) were involved in airplane crashes, and 3.0% (n=7) were involved in ATV crashes. With passenger vehicle deaths making up the majority of all transportation deaths, the rest of this data brief will focus specifically on passenger vehicle deaths.

Figure 2. Motor vehicle and other transportation deaths occurring among those under age 18 in Colorado by leading types, 2014-2018 (n=233)



Passenger Vehicle Deaths

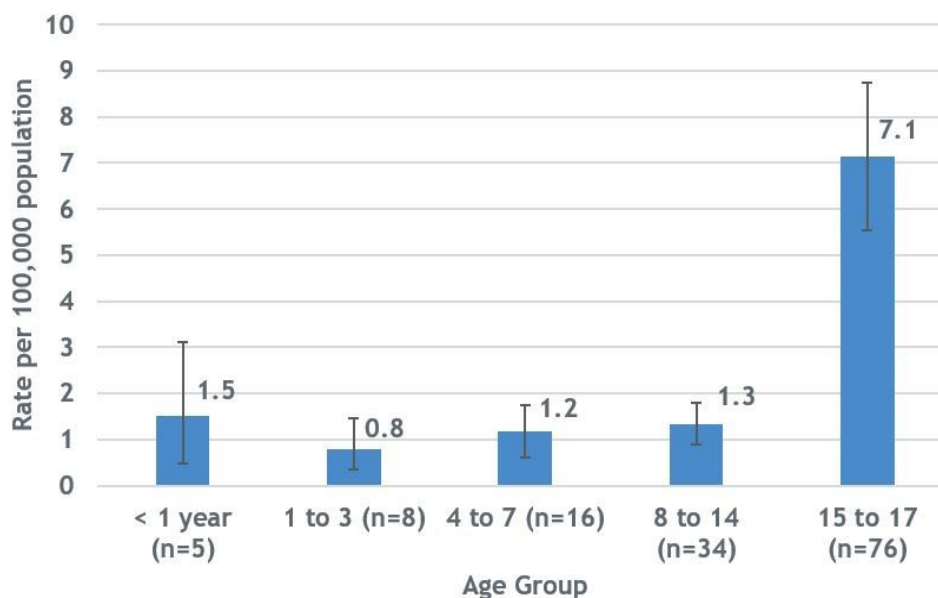
From 2014-2018, 160 infants, children, and youth died in Colorado as a result of passenger vehicle crashes. The overall rate of passenger vehicle deaths for the period was 2.2 per 100,000 population, slightly less than the national rate of passenger vehicle deaths over the same period (2.3 per 100,000 population).^{24,25}

Demographic Characteristics

Age

Of the 160 deaths, 78.8% (n=126) occurred among those ages 8-17. Figure 3 displays the age-specific rates of passenger vehicle deaths occurring among Colorado residents. The age-specific rate of passenger vehicle deaths was highest among those ages 15-17 at 7.1 deaths per 100,000 population. This is significantly higher than for all other age groups.

Figure 3. Age-specific rates of passenger vehicle deaths occurring in Colorado among Colorado residents under age 18 by age group, 2014-2018 (n=139)



*Error bars represent 95% confidence limits for rates.

Sex

Males represented 55.6% (n=89) of all passenger vehicle deaths. While males (2.4 per 100,000 population) have a higher rate than females (2.0 per 100,000 population), this difference was not statistically significant.

Sexual Orientation and Gender Identity

Defining Sexual Orientation, Gender Identity, and Gender Expression

- **Sexual Orientation:** A person's physical or emotional attraction to people of the same, neither, both, and/or opposite gender. "Heterosexual," "bisexual," and "homosexual" are all sexual orientations. A person's sexual orientation is distinct from a person's gender identity and expression.
- **Gender Identity:** A person's innate, deeply felt sense of identifying as male, female, or non-binary, regardless of the sex assigned at birth. Gender identity is distinct from sexual orientation. The term "cisgender" means someone's gender identity is the same as their sex assigned at birth. "Transgender" refers to a gender identity that is different from the sex assigned at birth.
- **Gender Expression:** A person's characteristics and behaviors that are socially defined as either masculine or feminine, such as dress, grooming, and mannerisms. Social or cultural norms can vary widely and some characteristics accepted as masculine, feminine or neutral in one culture may be different in another.

Experiences of harassment related to real or perceived sexual orientation and gender identity are common for lesbian, gay, bisexual, transgender, queer, and questioning (LGBTQ+) youth.²⁶ The '+' in LGBTQ+ stands for other sexualities, sexes, and genders that are not included in these few letters, which can include intersex, asexual, pansexual, agender, bigender, and gender queer. The stigma and discrimination experienced by LGBTQ+ youth is driven by heterosexual and cisgender norms that dominate our culture and systems.²⁷ This social context impacts health for LGBTQ+ people across the lifespan, including increased risky driving behaviors.^{28,29}

In order to better understand these disparities and address the unique needs of LGBTQ+ people, it is critical to gather complete and standardized data about sexual orientation and gender identity. While CFPS does ask and attempts to collect information about the sexual orientation and gender identity of children and youth who die in Colorado, there are notable challenges for CFPS and other mortality data systems to accurately capture sexual orientation and gender identity information. It is worth noting that during the time period when deaths that occurred from 2014-2018 were being reviewed, questions asking about sexual orientation and gender identity were inconsistently available in the National Fatality Review-Case Reporting System (NFR-CRS), the data tool that CFPS uses. In April 2018, existing sexual orientation and gender identity questions were removed from the NFR-CRS. CFPS added Colorado-specific sexual orientation and gender identity questions in April 2019, and in April 2020, the National Center for Fatality Review and Prevention added sexual orientation and gender identity questions back into the NFR-CRS for all states. In addition, the NFR-CRS added a life stressors section in its newest update, which will improve CFPS's ability to understand how stress due to sexual orientation and/or gender identity contributes to deaths among children and youth.

In an effort to reduce barriers in collecting this information, local child fatality prevention review teams receive guidance and technical assistance on how to discuss sexual orientation and gender identity during fatality reviews.

Although CFPS faces challenges in collecting data about sexual orientation and gender identity, there are other data sources in Colorado to provide information about risky driving behaviors by sexual orientation and gender identity. The Healthy Kids Colorado Survey (HKCS) is Colorado's only comprehensive survey on the health and well-being of young people. The purpose of HKCS is to better understand youth health and the factors that help young people make healthy choices.³⁰ The HKCS asks high school students to self-identify as lesbian, gay, bisexual (LGB), or heterosexual, and if they self-identify as transgender or cisgender, or not sure for each category.

2017 data from HKCS³¹ shows that:

- 8.6% of LGB students drove a vehicle when they had been drinking alcohol at least once during the past 30 days, compared to 5.0% of heterosexual students. Compared with 5.2% of cisgender students, 38.3% of all transgender youth reported drinking alcohol and driving in the past month.
- 12.1% of LGB students drove a vehicle when they had been using marijuana at least once during the past 30 days, compared to 8.5% of heterosexual students. Compared with 8.7% of cisgender students, 31.8% of all transgender youth reported using marijuana and driving in the past month.

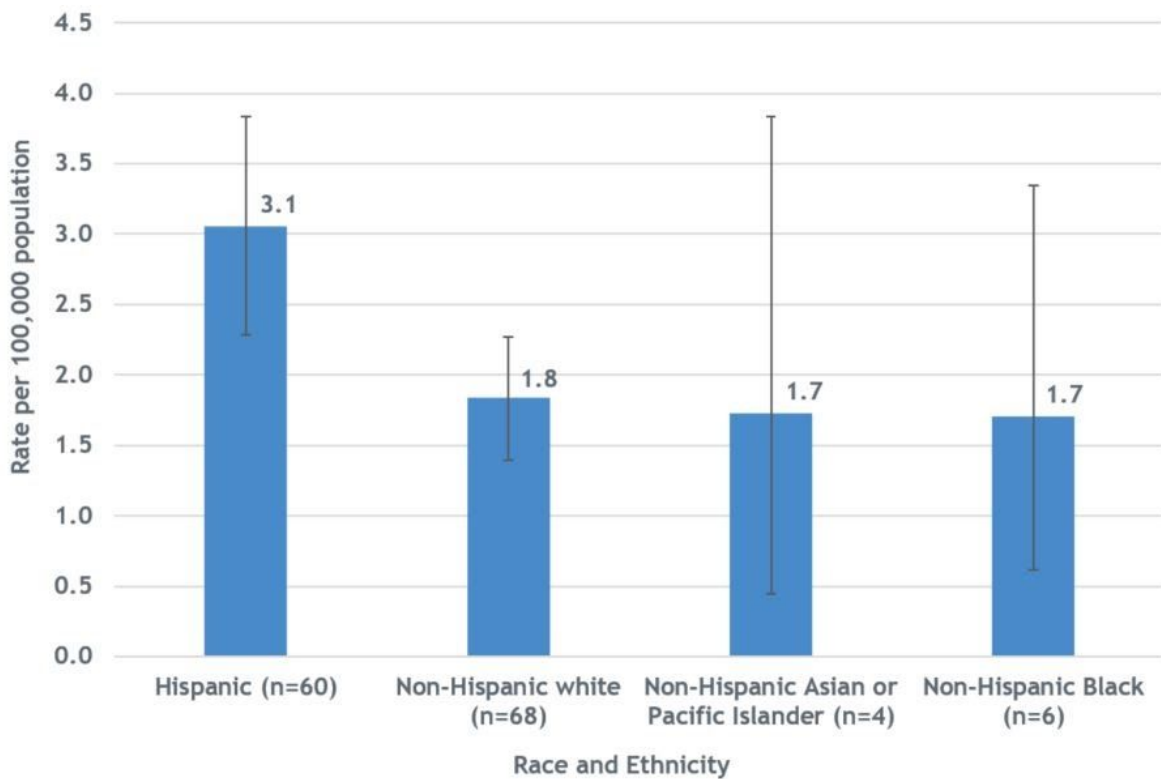
Race and Ethnicity

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.³² Additionally, “Latinx” and “Chicanx” are increasingly used gender inclusive terms, respecting those with a non-binary gender identity.^{33,34} To ensure clarity, this report uses “Hispanic” throughout the data section to reflect how CFPS data is collected from the death certificate and to align with terminology used in cited literature and research.³⁵

Between 2014 and 2018, the majority of infants, children, and youth who died in passenger vehicle crashes were non-Hispanic white (48.8%, n=78), 40.6% (n=65) were of Hispanic origin, 5.0% (n=8) were non-Hispanic Black, and 3.1% (n=5) were non-Hispanic Asian or Pacific Islander.

Colorado observed a significant disparity in the rate of passenger vehicle deaths by race and ethnicity (Figure 4). The rate for Hispanic infants, children, and youth (3.1 per 100,000 population) was significantly higher than non-Hispanic white (1.8 per 100,000 population) for the period.

Figure 4. Rates of passenger vehicle deaths occurring in Colorado among Colorado residents under age 18 by race and ethnicity, 2014-2018 (n=139)



*Error bars represent 95% confidence limits for rates.

This significant disparity expands when examined by both ethnicity and sex, where Hispanic males die in passenger vehicle crashes at a rate of 3.5 per 100,000 population, compared to 1.7 per 100,000 non-Hispanic white males. This is consistent with both historical and current national trends in which Hispanic male youth are disproportionately represented among motor vehicle crash injury and death statistics.³⁶

This disparity is one of the most considerable anomalies to the Latino Epidemiological Paradox, in which Hispanic people tend to have similar or better health outcomes than non-Hispanic whites, despite disproportionately experiencing factors such as poverty, low education, and low access to care.³⁷ Given this anomaly, it is crucial to consider why this disparity exists and persists among those who die as a driver or passenger in a vehicle.

In 1956, the Federal Aid Highway Act allocated billions of dollars to interstate highway construction, delivering the safest and most modern mode of interstate and local travel at the time. It also provided employment opportunities for people out of work.³⁸ Many have since argued the legislation was hastily planned and implemented, and the government built the roads primarily for the convenience of non-Hispanic white commuters.^{39,40} The government built these massive highways through or near racially and ethnically segregated, urban communities. This resulted in disinvestment in neighborhood infrastructure, lower property values, increased poverty, inadequate access to high-quality education, and more dangerous environments for living, driving, and walking.⁴¹

Physical and built environmental factors also perpetuate disparities in these deaths. For example, investments in road safety engineering are less likely to occur in segregated and low income communities.⁴² Persisting social and systemic inequities increase the likelihood that those living in racially segregated neighborhoods without infrastructure investment will continue to experience disparate impacts.

Data from the American Community Survey from 2018 shows that 14.5% of Hispanic Coloradans live below the poverty level, compared to 7.5% of non-Hispanic white Coloradans.⁴³ This structural injustice may contribute to the deadly motor vehicle crash disparity. For instance, research suggests that even though motor vehicle deaths have decreased nationally, the decreases have largely benefited more affluent and well-educated communities. These are communities where people are more likely to own vehicles with higher crash test ratings and advanced safety features.⁴⁴

Additionally, differences in child restraint use (seat belts and booster and car seats) may contribute to disparities. Families of color are less likely than the general population to use proper safety restraints.⁴⁵ Within the CFPS data set, among the Hispanic infants, children, and youth who died in passenger vehicle crashes in Colorado during this period, 72.3% (n=47) were improperly restrained, compared to 46.2% (n=36) of non-Hispanic whites. This is consistent with state and national trends in which Hispanic infants, children, and youth had a significantly higher proportion of unrestrained deaths compared with non-Hispanic white children.^{46,47}

Although most caregivers are aware of the need to use proper safety restraints for children, research suggests that Hispanic caregivers may be less likely to use safety restraints in certain situations. Such situations include being on a short drive or in a rush, having an inadequate number of restraints, and if someone was holding the infant or child.⁴⁸ Based on this data, child safety restraint education and distribution programs should collaborate with communities of color on the best methods to increase safety belt use.

Geography

Between 2014 and 2018, the majority of Colorado residents under age 18 who died in passenger vehicle crashes in Colorado resided in an urban county (74.8%, n=104), while 18.0% (n=25) lived in a rural county, and 7.2% (n=10) lived in a frontier county. The rate of passenger vehicle deaths among infants, children, and youth living in a frontier county (7.4 per 100,000 population) was nearly four-times higher as those living in an urban county (1.9 per 100,000 population) and nearly two-times higher as those living in a rural county (4.2 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.

This rate data is consistent with national data showing higher passenger vehicle death rates in rural areas.⁴⁹ Families living in rural and frontier counties experience limited access to Level 1 trauma centers and longer response times by emergency medical services to the scene of a reported trauma,⁵⁰ which may impact emergency response to motor vehicle crashes. Additionally, national studies show that self-reported seat belt use is lowest in the most rural counties and that the proportion of unrestrained occupants at the time of a fatal crash increases as rurality increases.⁵¹

Passenger Vehicle Death Causes

For 150 of the 160 infants, children, and youth who died in passenger vehicle crashes, review teams determined a driver was responsible for causing the crash. In these instances, CFPS was able to collect data on the causes of the crash. This data comes from a law enforcement officer or the motor vehicle crash report. Recklessness (52.0%, n=78), speeding over the limit (47.3%, n=71) and drug or alcohol use (35.3%, n=53) were the most frequently reported causes of deadly crashes. Additional reported causes include driver inexperience (31.3%, n=47), vehicle rollover (27.3%, n=41), and distracted driving (23.3%, n=35). These causes are not mutually exclusive, as more than one cause can be determined as contributing to a crash.

Restraint Use

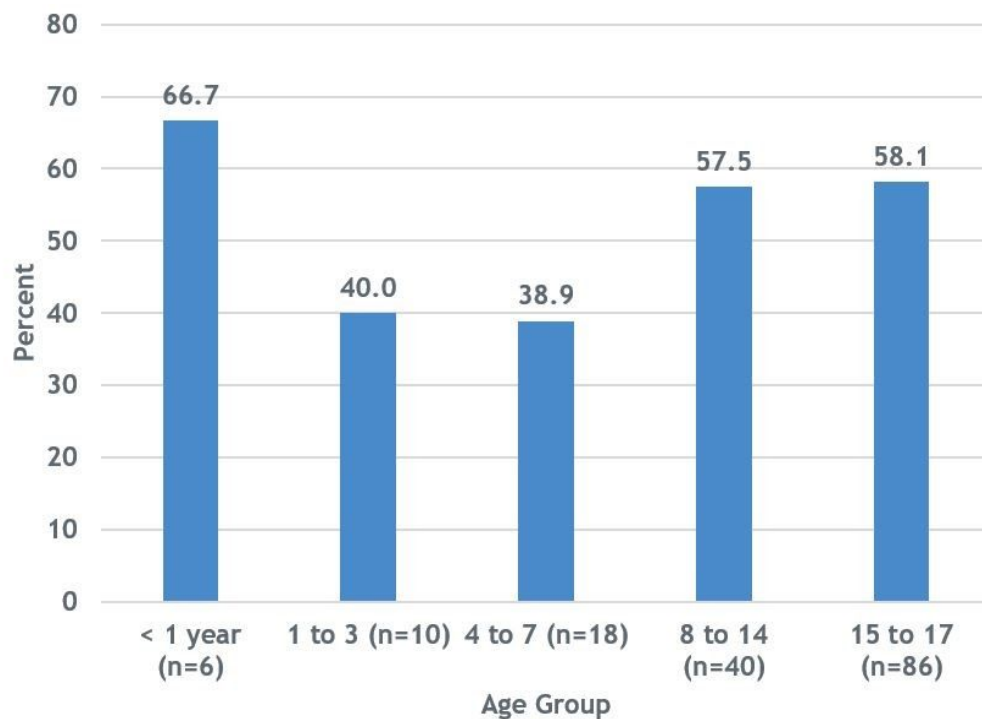
Increasing safety belt and restraint use is the single most effective way to save lives and reduce injuries due to crashes on Colorado roadways. Studies demonstrate that seat belts reduce serious injuries and death in crashes by about 50%.⁵² Colorado's child passenger safety law requires:

- Children to be in a rear-facing car seat until 1 year of age;
- Children ages 1-3 to be secured in a rear or forward-facing car seat, depending upon their height and weight;
- Children ages 4-7 to be secured in a forward-facing car seat or booster seat, depending upon their height and weight;
- Children ages 8-16 to correctly use a booster seat or lap and shoulder seat belt.

Of the 160 infants, children, and youth who died in Colorado in passenger vehicle crashes from 2014- 2018, 43.8% (n=70) were in an age-appropriate restraint, meaning that there was a car seat, booster seat, or seat belt present in the vehicle (depending on their age), regardless of if it was being used correctly or incorrectly. Of those, 81.4% (n=57) were properly restrained, meaning that the age-appropriate restraint was present *and* being used correctly. A total of 35.6% (n=57) of all infants, children, and youth who died in passenger vehicle crashes were properly restrained, 55.0% (n=88) were improperly restrained, and restraint information was missing or unknown for 9.4% (n=15).

Figure 5 displays the proportion of infants, children, and youth who died improperly restrained by age group. The highest proportions of improperly restrained infants, children, and youth in passenger vehicle crashes were less than age 1 (66.7%, n=4) and 15-17 years old (58.1%, n=50). Since Colorado law requires all children and young people to be properly restrained, there is a need for increased education, policies, and other systems change that increases seat belt use among infants, children, and youth of all ages.

Figure 5. Proportion of passenger vehicle deaths occurring among those under age 18 in Colorado who were improperly restrained by age group, 2014-2018 (n=160)

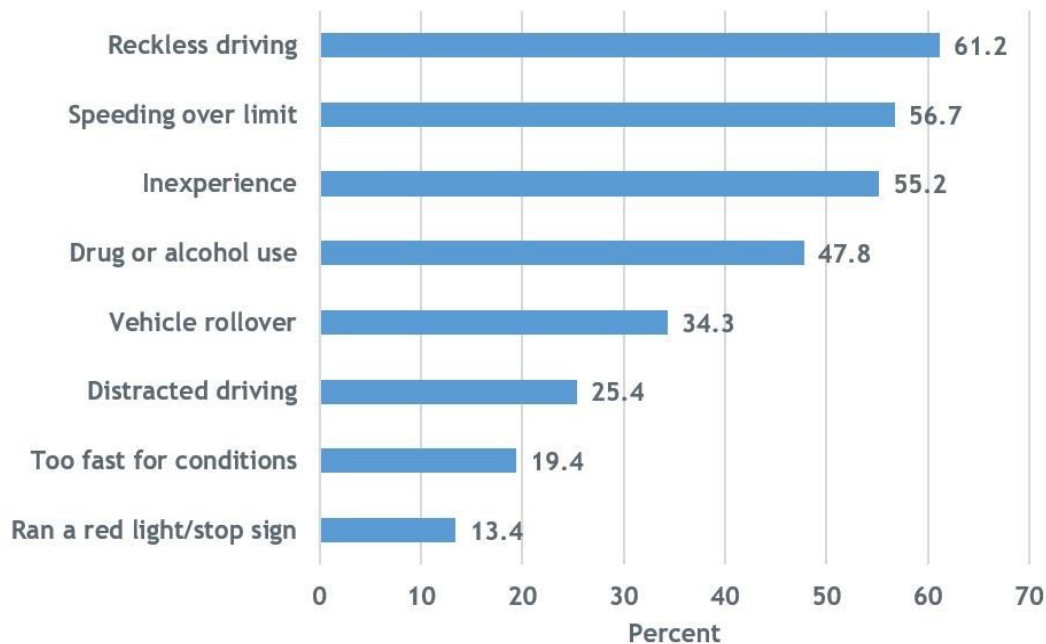


Young Drivers

From 2014-2018 there were 70 infants, children, or youth who died in passenger vehicle crashes involving 73 young drivers under age 19. Those who died in these crashes were most often a passenger involved in a crash with a young driver (50.0%, n=35) or the young driver themselves (50.0%, n=35). While 54.3% (n=19) of young drivers who died were improperly restrained, 60.0% (n=21) of their passengers who died were improperly restrained. Nearly all of these passengers were youth ages 10-17.

Sixty-seven of the 73 young drivers (91.8%) in these deadly crashes were responsible for causing the crash. Figure 6 demonstrates the leading circumstances contributing to crashes where young drivers were responsible for causing the crash. Recklessness (61.2%, n=41), speeding over the limit (56.7%, n=38), and driver inexperience (55.2%, n=37) were the leading circumstances in crashes where the youth was at fault. Drug or alcohol impairment was a circumstance contributing to the crash in 47.8% (n=32) of the cases.

Figure 6. Leading circumstances contributing to passenger vehicle deaths among those under age 18 in Colorado where a young driver was responsible, 2014-2018 (n=67)



CFPS data suggests that young drivers in Colorado are not getting the support they need to prevent motor vehicle crashes. There is a need for strengthened Graduated Driver Licensing (GDL) state laws to protect young drivers and their passengers with corresponding widespread education and enforcement. While CFPS does ask and attempts to collect information about license type for drivers involved in deadly crashes, this data is largely incomplete. Information on driver's license type is missing or unknown for about 50% of young drivers that

were involved in passenger vehicle crashes. The CFPS 2020 Legislative Report includes a data quality improvement recommendation to provide technical assistance to local teams on best practices for collecting driver's license information for drivers involved in deadly crashes, as well as potential GDL violations by a young driver.

Conclusion

From 2014 to 2018, motor vehicle and other transportation deaths were the third leading cause of death reviewed by CFPS among those under age 18 in Colorado. Over two-thirds of those who died were occupants of passenger vehicles. The highest rates of passenger vehicle death were observed among youth ages 15-17 and among Hispanic infants, children, and youth. Passenger vehicle deaths were most often precipitated by recklessness and speeding, and the majority of young people who died were improperly restrained. Upstream prevention strategies that address social and structural inequities can reduce motor vehicle and other transportation deaths among infants, children, and youth. To learn more about the prevention strategies recommended by CFPS, view the 2020 Legislative Report (www.cochildfatalityprevention.com/p/reports.html).

*For more information and CFPS data, please contact the CFPS Support Team at the Colorado Department of Public Health and Environment:
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