



**COLORADO CHILD  
FATALITY  
PREVENTION  
SYSTEM**

Motor Vehicle and Other  
Transportation-Related Death  
Data, 2013 - 2017



**COLORADO**  
Department of Public  
Health & Environment

# MOTOR VEHICLE AND OTHER TRANSPORTATION-RELATED DEATH DATA, 2013 - 2017

## INTRODUCTION

The Child Fatality Prevention Act (Article 20.5 of Title 25, Colorado Revised Statutes) established the Child Fatality Prevention System (CFPS), a statewide, multidisciplinary, multi-agency effort to prevent child deaths. Although not codified in Colorado Revised Statutes (C.R.S.) until 2005, CFPS has been conducting retrospective reviews of child deaths in Colorado since 1989. CFPS applies a public health approach to prevent child deaths by aggregating data from individual child deaths, describing trends and patterns of the deaths and recommending prevention strategies. Child fatality prevention review teams and their partners implement and evaluate the identified strategies at the state and local levels with the goal of preventing similar deaths in the future.

The data presented within this data summary come from comprehensive, statutorily-mandated reviews of deaths among those under 18 years of age occurring in Colorado between 2013 and 2017. Local child fatality prevention review teams are responsible for conducting individual, case-specific reviews of deaths of children meeting the statutory criteria. Reviewable child deaths result from

one or more of the following causes: undetermined causes, unintentional injury, violence, motor vehicle and other transportation-related, child maltreatment, sudden unexpected infant death (SUID) and suicide. During the 2018 fiscal year, local teams reviewed deaths that occurred in 2017.

The CFPS review process includes deaths of Colorado residents occurring in Colorado, as well as deaths of out-of-state residents who died in Colorado or were transported to a Colorado hospital and died. CFPS does not review deaths of Colorado residents that occur outside Colorado. These criteria are different from other reports of child fatality data and many other Colorado government data sources. As a result, the data presented in this topic-specific data brief may not match other statistics reported at both the state and national levels. This data brief provides an overview of motor vehicle and other transportation-related death data from CFPS. Additional CFPS data is available in a state-level overview, cause-specific data briefs and an interactive data dashboard at: [www.cochildfatalityprevention.com/p/reports.html](http://www.cochildfatalityprevention.com/p/reports.html).

## STRUCTURAL INEQUITY

CDPHE acknowledges that generations-long social, economic and environmental inequities result in adverse health outcomes. They affect communities differently and have a greater influence on health outcomes than either individual choices or one's ability to access health care. Reducing health disparities through policies, practices and organizational systems can help improve opportunities for all Coloradans.<sup>1</sup>

Some families lose infants, children and youth to the types of deaths reviewed by CFPS not as the result of the actions or behaviors of those

who died, or their parents or caregivers. Social factors such as where they live, how much money or education they have and how they are treated because of their racial or ethnic backgrounds can also contribute to a child's death.<sup>2</sup> In the United States, most residents grew up and continue to live in racially and economically segregated neighborhoods, which can lead to marginalization.<sup>3,4</sup> This marginalization of groups into segregated neighborhoods further impacts access to high-quality education,<sup>5</sup> employment opportunities,<sup>6</sup> healthy foods<sup>7</sup> and health care.<sup>8</sup> Combined, the economic injustices associated with residential, educational

and occupational segregation have lasting health impacts that include adverse birth outcomes, infant mortality,<sup>9</sup> high rates of homicide and gun violence<sup>10</sup> and increased motor vehicle deaths.<sup>11</sup>

When interpreting the data, it is critical not to lose sight of these systemic, avoidable and unjust factors. These factors perpetuate the inequities

that we observe in child deaths across populations in Colorado. Research is making progress in understanding how race and ethnicity, economic status, 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 eradicate them.

A note about terminology: While “Latinx” is becoming the preferred way to identify people of Latin descent, this report uses “Hispanic” throughout the data section to reflect how CFPS data is collected and to align with terminology used in cited literature and research.<sup>12</sup>

## OVERVIEW OF MOTOR VEHICLE AND OTHER TRANSPORTATION-RELATED DEATHS

From 2013 through 2017, there were 237 motor vehicle and other transportation-related deaths among infants, children and youth ages 0-17 in Colorado. Motor vehicle and other transportation-related 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-related deaths occurring from 2013-2017. The number of deaths ranged from 37 in 2015 to 59 in 2017 and averaged about 48 per year for the five-year period.

**Figure 1. Motor vehicle and other transportation-related deaths occurring among those under age 18 in Colorado by year, 2013-2017 (n=237)**

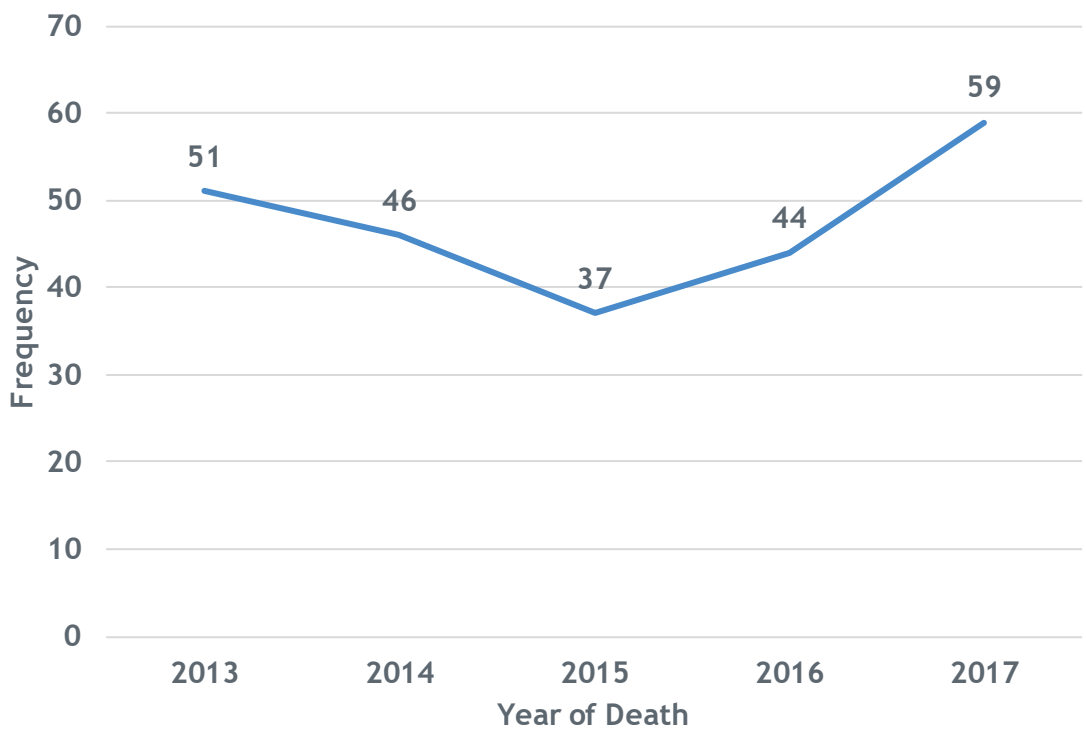
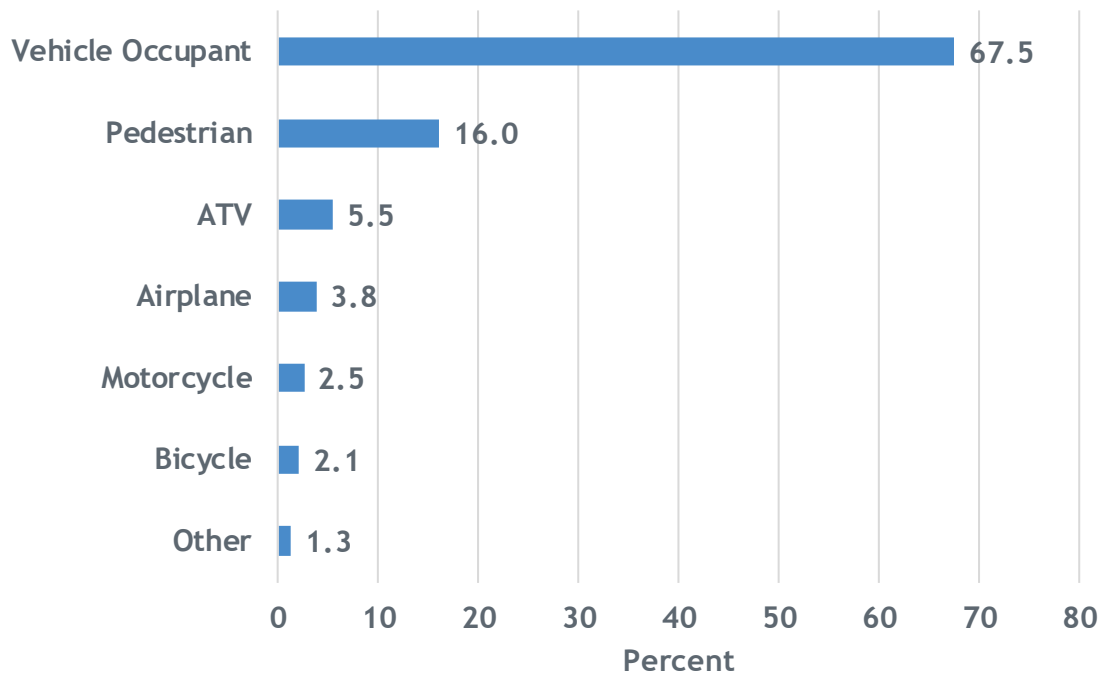




Figure 2 demonstrates that 67.5 percent (n=160) of children or youth who died in motor vehicle and other transportation-related deaths were occupants of passenger vehicles, 16.0 percent (n=38) were pedestrians and 5.5 percent (n=13) were involved in ATV crashes.

**Figure 2. Motor vehicle and other transportation-related deaths occurring among those under age 18 in Colorado by leading types, 2013-2017 (n=237)**

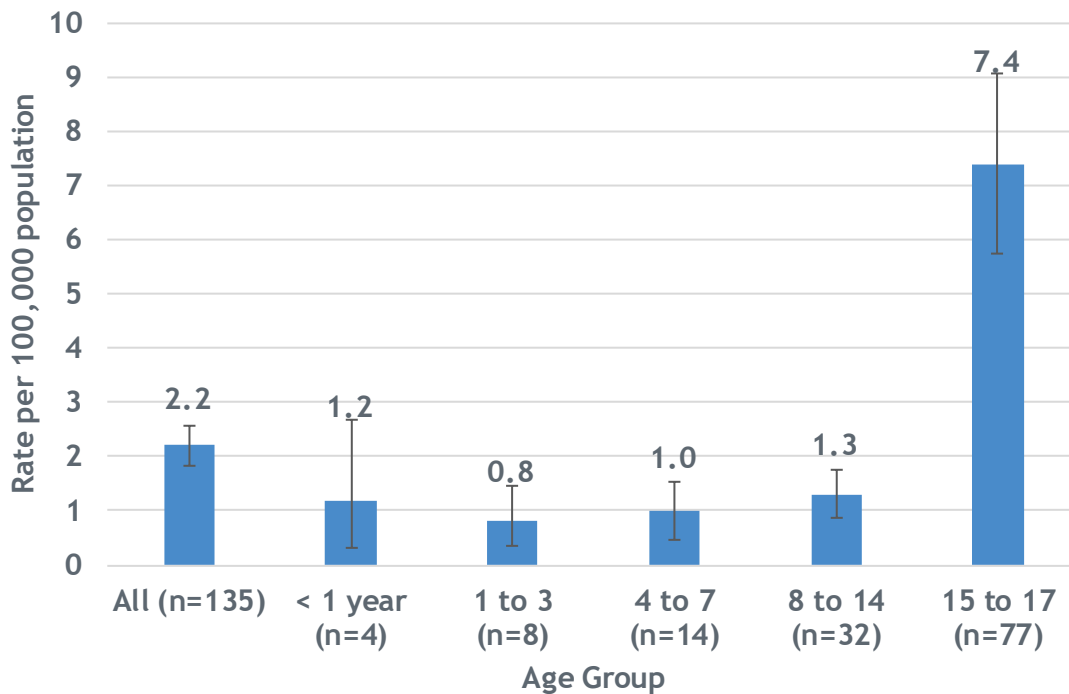


## PASSENGER VEHICLE DEATHS

From 2013-2017, 160 infants, children and youth died in Colorado as a result of passenger vehicle crashes. Of the 160 deaths, 80.0 percent (n=128) occurred among those ages 8-17. Males represented 59.4 percent (n=95) of all deaths.

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 7.4 deaths per 100,000 population. This is significantly higher than for all other age groups. While males (2.5 per 100,000 population) have a higher rate than females (1.8 per 100,000 population) in all age groups, this difference was not statistically significant (data not shown).

Figure 3. Age-specific rates of passenger vehicle deaths occurring in Colorado among Colorado residents under age 18 by age group, 2013-2017 (n=135)



## RACIAL AND ETHNIC INEQUITIES

Colorado observed a significant inequity in the rate of passenger vehicle deaths by race and ethnicity. The rate for Hispanic infants, children and youth (3.0 per 100,000 population) was significantly higher than non-Hispanic white (1.8 per 100,000 population) for the period (data not shown).

This significant inequity expands when examined by both ethnicity and sex, where Hispanic males die in passenger vehicle crashes at a rate of 3.8 per 100,000 population, compared to 1.8 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.<sup>13</sup>

This inequity 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.<sup>14</sup> Given this anomaly, it is crucial to

consider why this inequity 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.<sup>15</sup> 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.<sup>16,17</sup> 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.<sup>18</sup>

Data from the American Community Survey from 2013-2017 shows that 19.3 percent of Hispanic Coloradans

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live below the poverty level, compared to 8.5 percent of non-Hispanic white Coloradans.<sup>19</sup> This structural injustice may contribute to deadly motor vehicle crash inequity. 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.<sup>20</sup>

Additionally, differences in child restraint use (seat belts and booster and car seats) may contribute to inequities. Racial and ethnic minority populations are less likely than the general population to use proper safety restraints.<sup>21</sup> Among the Hispanic infants, children and youth who died in passenger vehicle crashes in Colorado during this period, 68.7 percent (n=46) were improperly restrained, compared to 50.6 percent (n=40) 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

## PASSENGER VEHICLE DEATH CAUSES

For 148 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 (51.4 percent, n=76), speeding over the limit (51.4 percent,

## 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 percent.<sup>26</sup> 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

compared with non-Hispanic white children.<sup>22,23</sup>

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.<sup>24</sup> Based on this data, child safety restraint education and distribution programs should focus on minority communities.

Physical and built environmental factors also perpetuate inequities in these deaths. For example, investments in road safety engineering are less likely to occur in segregated and low income communities.<sup>25</sup> Persisting social and systemic inequities increase the likelihood that those living in racially segregated neighborhoods without infrastructure investment will continue to experience these disparate impacts. These impacts will cost communities friends, loved ones, and neighbors.

n=76) and driver inexperience (35.1 percent, n=52) were the most frequently reported causes of deadly crashes. Additional reported causes include vehicle rollover (29.7 percent, n=44), drug or alcohol use (28.4 percent, n=42) and distracted driving (19.6 percent, n=29). These causes are not mutually exclusive, as more than one cause can be determined as contributing to a crash.

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.

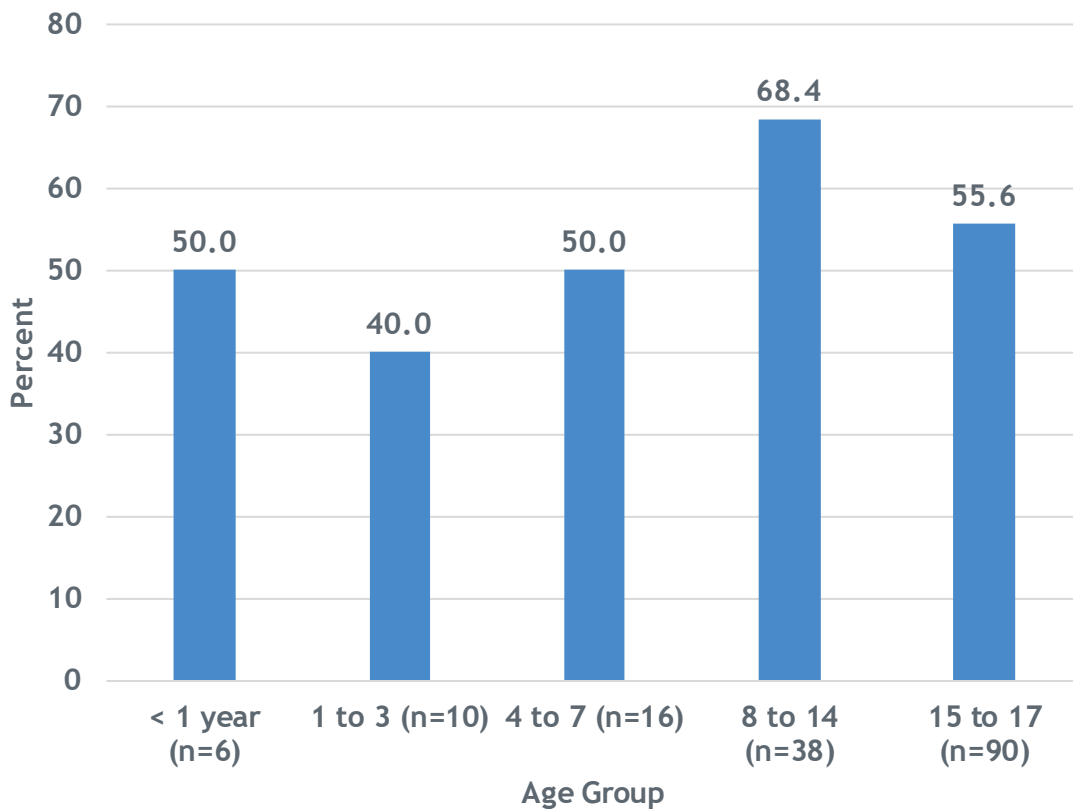
Of the 160 infants, children and youth who died in Colorado in passenger vehicle crashes from 2013- 2017, 41.3 percent (n=66) were in an age-appropriate restraint, meaning that there was a car seat, booster seat or seat belt present in the vehicle (depending on their age), regardless of if it was being used correctly or incorrectly. Of those, 78.8 percent were properly restrained, meaning that the age-appropriate restraint was present and

being used correctly. A total of 32.5 percent (n=52) of all infants, children and youth who died in passenger vehicle crashes were properly restrained, 56.9 percent (n=91) were improperly restrained, and restraint information was missing or unknown for 10.6 percent (n=17).

Figure 4 displays the proportion of infants, children and youth who died improperly restrained by age

group. The highest proportions of improperly restrained children and youth in passenger vehicle crashes were 8-14 years old (68.4 percent, n=26) and 15-17 years old (55.6 percent, n=50). Since Colorado law requires all children and young people are required to be properly restrained, there is a need for increased education, policies, and other systems change that increases seat belt use among those ages 8-17.

**Figure 4. Proportion of passenger vehicle deaths occurring among those under age 18 in Colorado where an age-appropriate restraint was not used correctly by age group, 2013-2017 (n=160)**



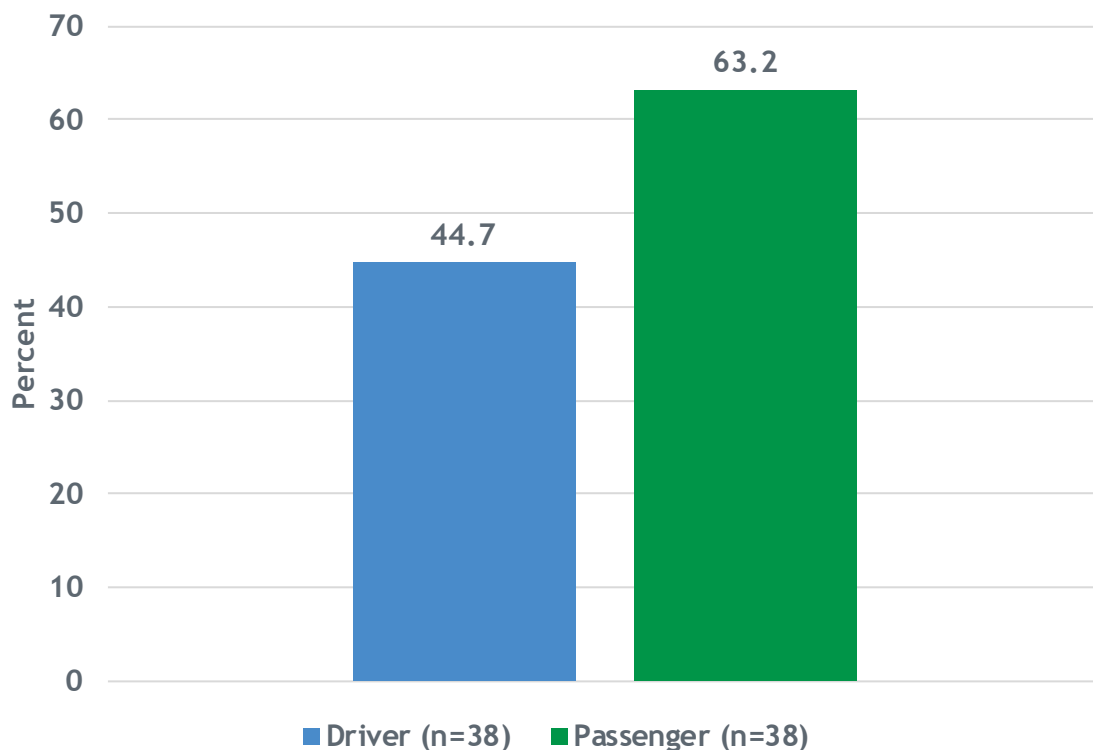
## YOUNG DRIVERS

From 2013-2017 there were 76 infants, children or youth who died in passenger vehicle crashes involving 79 young drivers 18 years of age and under. Those who died in these crashes were most often the passenger of a young driver (50.0 percent, n=38) or the young driver themselves (50.0 percent, n=38). Seventy-two of the 79 young drivers (91.1 percent) in these deadly crashes were responsible for causing the crash. Speeding over the limit (63.9 percent, n=46), recklessness (61.1 percent, n=44), and inexperience (59.7 percent, n=43) were the leading circumstances in crashes where the youth was at fault. Of these crashes drug or alcohol impairment was a circumstance contributing to the crash in 36.1

percent (n=26) of the cases.

Figure 5 demonstrates the proportion of young drivers or passengers of young drivers who died and were improperly restrained (not wearing a seat belt or wearing it incorrectly). While 44.7 percent (n=17) of young drivers who died were improperly restrained, 63.2 percent (n=24) of their passengers who died were improperly restrained. Nearly all of these passengers were also ages 15-17. 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.

**Figure 5. Proportion of passenger vehicle deaths involving young drivers (those under age 18) in Colorado who were improperly restrained by position, 2013-2017 (n=76)**



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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## REFERENCES

1. Office of Health Equity, Colorado Department of Public Health and Environment, Statement on structural inequity. Retrieved from [www.colorado.gov/pacific/cdphe/statement-on-structural-inequity](http://www.colorado.gov/pacific/cdphe/statement-on-structural-inequity).
2. Bailey, Z. D., Krieger, N., Agénor, M., Graves, J., Linos, N., & Bassett, M. T. (2017). Structural racism and health inequities in the USA: evidence and interventions. *The Lancet*, 389(10077), 1453-1463.
3. Pager, D., & Shepherd, H. (2008). The Sociology of Discrimination: Racial Discrimination in Employment, Housing, Credit, and Consumer Markets. *Annual Review of Sociology*, 34, 181-209.
4. Williams, D. R., & Collins, C. (2016). Racial residential segregation: a fundamental cause of racial disparities in health. *Public Health Reports*, 116(5), 404-16.
5. Williams, D. R., & Collins, C. (2016). Racial residential segregation: a fundamental cause of racial disparities in health. *Public Health Reports*, 116(5), 404-16.
6. Collins, C. A., & Williams, D. R. (1999). Segregation and mortality: the deadly effects of racism?. In *Sociological Forum*, 14(3), 495-523. Kluwer Academic Publishers-Plenum Publishers.
7. Larson, N. I., Story, M. T., & Nelson, M. C. (2009). Neighborhood environments: disparities in access to healthy foods in the US. *American journal of preventive medicine*, 36(1), 74-81.
8. White, K., Haas, J. S., & Williams, D. R. (2012). Elucidating the role of place in health care disparities: the example of racial/ethnic residential segregation. *Health Services Research*, 47(3pt2), 1278-1299.
9. Acevedo-Garcia, D., Lochner, K. A., Osypuk, T. L., & Subramanian, S. V. (2003). Future directions in residential segregation and health research: a multilevel approach. *American journal of public health*, 93(2), 215-221.
10. Collins, C. A., & Williams, D. R. (1999, September). Segregation and mortality: the deadly effects of racism?. In *Sociological Forum* (Vol. 14, No. 3, pp. 495-523). Kluwer Academic Publishers-Plenum Publishers.
11. King, M. (2017). Under The Hood: Revealing Patterns Of Motor Vehicle Fatalities In The United States. *Publicly Accessible Penn Dissertations*. 2396. Retrieved on June 19, 2019 from: [repository.upenn.edu/edissertations/2396](http://repository.upenn.edu/edissertations/2396).
12. Office of Health Equity, Colorado Department of Public Health and Environment, Health Inequities Fact Sheet 2019: Latinx Coloradans Fact Sheet. Retrieved from: [drive.google.com/file/d/1z1b15A9hGaRxxv4XTTa9BiPnz5lwjvfr/view](http://drive.google.com/file/d/1z1b15A9hGaRxxv4XTTa9BiPnz5lwjvfr/view).
13. Vaca, F., & Anderson, C. L. (2009). US motor vehicle fatality trends in young Latino males. In *Annals of Advances in Automotive Medicine/Annual Scientific Conference*, 53, 77. Association for the Advancement of Automotive Medicine.
14. Hayes-Bautista, D. E., Hsu, P., Hayes-Bautista, M., Iniguez, D., Chamberlin, C. L., Rico, C., & Solorio, R. (2002). An anomaly within the Latino epidemiological paradox: the Latino adolescent male mortality peak. *Archives of Pediatrics & Adolescent Medicine*, 156(5), 480-484.
15. Weingroff, R. F. (1996). Federal-aid highway act of 1956: creating the interstate system. *Public Roads*, 60(1).
16. Davies, R. O. (1975). *The age of asphalt: The automobile, the freeway, and the condition of metropolitan America*. Lippincott.
17. Kay, J. H. (1998). *Asphalt nation: How the automobile took over America and how we can take it back*. Univ of California Press.
18. Males, M. A. (2009). Poverty as a determinant of young drivers' fatal crash risks. *Journal of Safety Research*, 40(6), 443-448.
19. Office of Health Equity, Colorado Department of Public Health and Environment, Health Inequities Fact Sheet 2019: Latinx Coloradans Fact Sheet. Retrieved from: [drive.google.com/file/d/1z1b15A9hGaRxxv4XTTa9BiPnz5lwjvfr/view](http://drive.google.com/file/d/1z1b15A9hGaRxxv4XTTa9BiPnz5lwjvfr/view).
20. Harper, S., Charters, T. J., & Strumpf, E. C. (2015). Trends in socioeconomic inequalities in motor vehicle accident deaths in the United States, 1995-2010. *American Journal of Epidemiology*, 182(7), 606-614.
21. Hanfling, M. J., Mangus, L. G., Gill, A. C., & Bailey, R. (2000). A multifaceted approach to improving motor vehicle restraint compliance. *Injury Prevention*, 6(2), 125-129.
22. Sauber-Schatz, E. K., West, B. A., & Bergen, G. (2014). Vital Signs: restraint use and motor vehicle occupant death rates among children aged 0-12 years—United States, 2002-2011. *MMWR. Morbidity and mortality weekly report*, 63(5), 113.
23. Harper, J. S., Marine, W. M., Garrett, C. J., Lezotte, D., & Lowenstein, S. R. (2000). Motor vehicle crash fatalities: a comparison of Hispanic and non-Hispanic motorists in Colorado. *Annals of Emergency Medicine*, 36(6), 589-596.
24. Zonfrillo, M. R., Ferguson, R. W., & Walker, L. (2015). Reasons for child passenger nonrestraint in motor vehicles. *Traffic Injury Prevention*, 16(2), S41-S45.
25. Cubbin, C., LeClere, F. B., & Smith, G. S. (2000). Socioeconomic status and injury mortality: individual and neighbourhood determinants. *Journal of Epidemiology & Community Health*, 54(7), 517-524.
26. Sauber-Schatz, E. K., West, B. A., & Bergen, G. (2014). Vital Signs: restraint use and motor vehicle occupant death rates among children aged 0-12 years—United States, 2002-2011. *MMWR. Morbidity and mortality weekly report*, 63(5), 113.