

Firearm Injuries in Colorado Children, 2014-2015

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Summary

Firearm injuries requiring an Emergency Department visit or hospitalization are common in children (0-14 years of age) in Colorado, occurring in both rural and urban areas and among children of all races and ethnicities. They were 28 times more likely to result in death than automobile injuries in 2014-2015. Overall, 17 children 0-14 years of age died due to firearm injury in Colorado in 2014-2015. The great majority of firearm injuries in children are unintentional and presumably preventable by limiting minor's access to these lethal weapons and improving firearm safety.

Methods: The numbers of firearm and automobile injuries during 2014-2015 in Colorado children were estimated using the Colorado Hospital Association inpatient and emergency department databases. The Colorado Department of Local Affairs website provided the population estimates by age, gender, and race/ethnicity by Colorado County for 2014 and 2015. Firearm and automobile injury patients were identified by the presence of external cause of injury E-codes for 2014 through September 2015, and equivalent ICD-10 codes for the last quarter of 2015 (see Appendix for more details). To adjust for possible double counting caused by transfers related to the same injury, cases with proximate dates of visit, and the same age in years, birth month, gender and ZIP Code were consolidated into a single record. Deaths due to firearm or automobile injury were validated using the Colorado Department of Public Health and Environment Death Dataset to account for those that did not result in an ED or hospital visit.

Results

Tables 1a and 1b show the numbers (and percentages) of firearm injuries for Colorado children (ages 0-14 years) requiring an Emergency Department visit or hospitalization in 2014-2015.

Unintentional firearm injuries were by far the most common, occurring in 88.5% of children (Table 1a). Firearm injury occurred in children of all race/ethnicities (Table 1b). Overall, eighty-eight percent of firearm injuries occurred among male children.

Table 1a. Causes of firearm injuries and fatalities by age group of Colorado children seen in an Emergency Department visit or inpatient hospitalization: 2014-2015

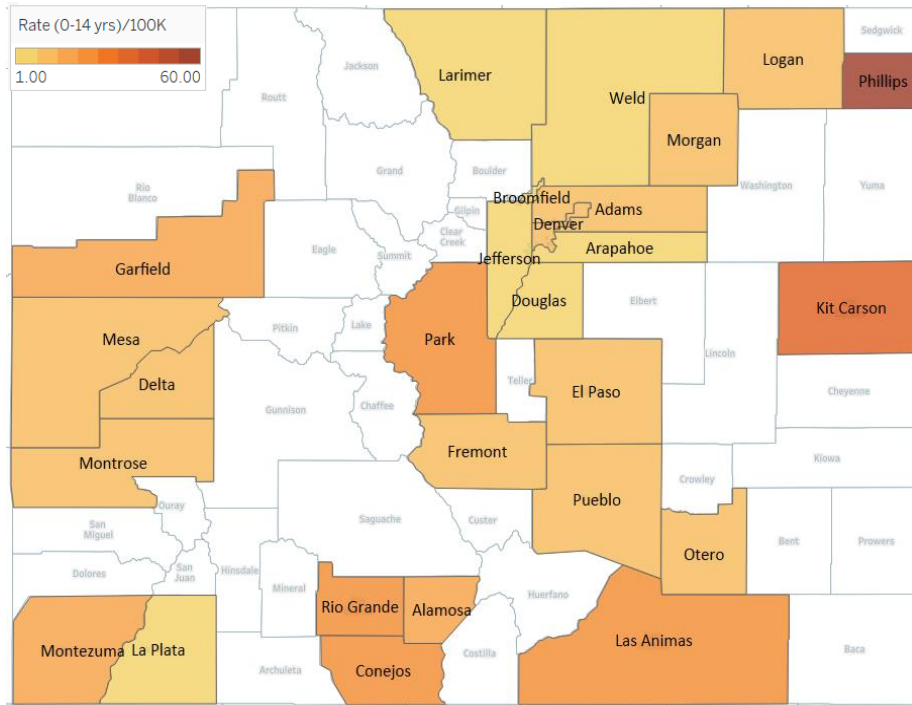
Age	Suicide				Total
	Assault	Attempt	Unintentional	Undetermined	
0-4 years	0 (0.0)	0 (0.0)	12 (100.0)	0 (0.0)	12 (3.5)
5-9 years	0 (0.0)	0 (0.0)	33 (97.1)	1 (2.9)	34 (9.8)
10-14 years	5 (4.9)	5 (4.9)	86 (84.3)	6 (5.9)	102 (29.4)
Total	5 (3.4)	5 (3.4)	131 (88.5)	7 (4.7)	148

Table 1b. Causes of firearm injuries and fatalities by race/ethnicity of Colorado children seen in an Emergency Department visit or inpatient hospitalization: 2014-2015

Race/Ethnicity	Suicide				Total
	Assault	Attempt	Unintentional	Undetermined	
White	2 (40.0)	3 (60.0)	71 (54.2)	4 (57.1)	80 (54.0)
Black	2 (40.0)	0 (0.0)	7 (5.3)	1 (14.3)	10 (6.8)
Hispanic	1 (20.0)	0 (0.0)	19 (14.5)	0 (0.0)	20 (13.5)
Other/Unknown	0 (0.0)	2 (40.0)	34 (26.0)	2 (28.6)	38 (25.7)
Total	5 (3.4)	5 (3.4)	131 (88.5)	7 (4.7)	148

Firearm injuries for Colorado children (ages 0-14 years) requiring an Emergency Department or hospitalization occurred in many counties in Colorado, with highest rates in rural counties (Figure 1)¹.

Figure 1: Map of average annual firearm injury rates (per 100,000) of Colorado Children, 0-14 years of age by county, 2014-2015.



The total fatalities for 2014-2015 among 0-14 year olds were 17 for firearm injury and 30 for automobile injuries.² Many were deceased at the scene and did not result in an ED or hospital encounter. The fatality rate due to firearm injury for children who did have an ED or hospital visit was 28 times greater than those with automobile injury (Table 2).

Table 2: Fatality rates (per 1,000 cases) for firearm and automobile injuries resulting in ED or hospital visit for Colorado children ages 0-14, 2014-2015.

2014-2015, ages 0-14	# Cases	# Fatalities	Fatality Rate	Rate Ratio
Firearm injury	148	3	20.27	28.21
Automobile injury				
Occupant	5,566	4	0.72	1.00
All injuries	6,124	5	0.82	1.14

¹ Note: County rates may be affected by small numerators and/or denominators.

² <http://www.cohid.dphe.state.co.us/scripts/htmsql.exe/mortalityPub.hsrl>

Comment:

Firearm injuries resulting in an Emergency Department visit or hospitalization are common in children (0-14 years of age) in Colorado, occurring on average every 4 to 5 days. They occur in both rural and urban areas and affect all races and ethnicities. The great majority are unintentional. They are much more likely to result in death than automobile injuries. Similar trends have been noted in other Colorado studies.¹ Overall, 17 children 0-14 years of age died due to firearm injury in Colorado in 2014-2015.

Efforts to improve automobile safety for children have resulted in significant decreases in automobile accident-related injury and death.²⁻⁴ Firearm injury is a public health problem that can effectively be reduced with similar approaches.⁵⁻¹¹ The American Academy of Pediatrics has recommended practical measures to limit access to firearms by children and to improve firearm safety.¹² Such measures should be seriously considered to address this significant Colorado problem.

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APPENDIX

Table 3a: ICD-9 E-codes for causes of firearm injuries

Cause of injury	E code and description
Assault	E965.0-E965.4 (assault by firearms)
Suicide attempt	E955.0-E955.4, E955.6, E955.9 (suicide and self-inflicted injury by firearms)
Unintentional	E922.0-E922.4, E922.8-E922.9 (accidental caused by firearms and air gun missiles)
Undetermined	E985.0-E985.4, E985.6 (injury by firearms or air guns undetermined whether accidentally or purposefully inflicted)

E code, external-cause-of-injury code

Table 3b: ICD-10 codes for causes of firearm injuries

Cause of injury	ICD-10 code and description
Assault	X93, X94, X95 (gun homicide, attempted or completed)
Suicide attempt	X72, X73, X74 (gun suicide, attempted or completed)
Unintentional	W32, W33, W34 (unintentional shooting, fatal or unfatal)
Undetermined	Y22, Y23, Y24 (unknown cause, fatal or non-fatal)

Table 3c: ICD-9 E-codes for causes of automobile injuries

Cause of injury	E code
Collision with another motor vehicle	E811
Collision with other vehicle	E813
Pedestrian collision	E814
Collision on highway	E815
Loss of control	E816
Unspecified nature	E819
Injured person code	(4th digit)
Driver of motor vehicle other than motorcycle	0
Passenger in motor vehicle other than motorcycle	1
Motorcyclist	2
Passenger on motorcycle	3
Pedal cyclist	6
Pedestrian	7
Other specified person	8
Unspecified person	9

Table 3d: ICD-10 codes for causes of automobile injuries

Cause of injury	ICD-10 code and description
V40-V49	Car occupant injured in collision
V50-V59	SUV or pickup truck occupant injured in collision
Collision object	(3rd digit)
0	Pedestrian or animal
1	Pedal cycle
2	2- or 3-wheeled motor vehicle
3	Car, pick-up truck or van
4	Heavy transport vehicle or bus
5	Railway train or railway vehicle
6	Other non-motor vehicle
7	Fixed or stationary object
8	Noncollision transport accident
9	Other and unspecified transport accidents
Injured Person Location	(4th digit)
2 or 7	Outside of vehicle
all other values	Inside or entering vehicle