



Colorado Department  
of Public Health  
and Environment

# BRIEF

## HEALTH STATISTICS SECTION

### Recreational Fatalities in Colorado, 1996-1998

July 2000 No. 35

*Unintentional injuries constitute the fifth leading cause of death in Colorado, killing over 1,400 Coloradans each year between 1996 and 1998. The number of deaths from unintentional injuries increased from 1,161 in 1990 to 1,539 in 1998. Deaths due to injuries during recreational activities are of particular interest in Colorado. This Brief aims to describe recreational activities-related fatalities that occurred in Colorado from 1996 through 1998 using the same procedures as those in a previous report describing recreational fatalities from 1993 through 1995<sup>1</sup>.*

*Unlike fatalities from most other leading causes of death, identification of the circumstances of injury death is not always possible through use of underlying cause of death codes. Therefore, to identify recreation-related fatalities, injury descriptions provided on the death certificate of all deaths occurring in Colorado during 1996 through 1998 were examined. Recreation relatedness was determined by analysis of the complete death certificate for each suspected case. Motor vehicle fatalities (decedent was a driver, passenger, or pedestrian) were not included in this report.*

*Although every effort was made to uncover all recreation-related deaths occurring in Colorado, this compilation may not be all inclusive. Due to the difficult nature of determining such fatalities, some recreational fatalities may have been missed.*

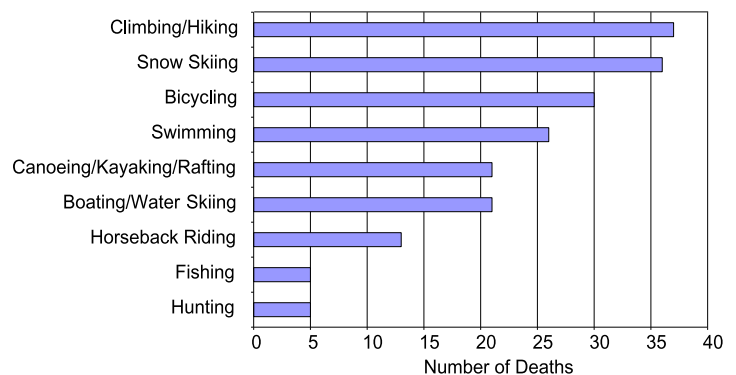
*The recreational fatalities identified were grouped by categories that best described the deaths and allowed for meaningful analyses. Because no standard categories for recreational deaths exist, the categories in the previous Brief and this report were determined by the Health Statistics Section after analysis of various reports and consultation with individuals specializing in injury epidemiology. Information regarding certain recreational categories is contained in the text for each category.*

*The data presented in this report are for those recreational fatalities that occurred during the calendar years 1996-1998 in the state of Colorado to both state residents and nonresidents. Because of the small sample size, the conclusions drawn in this report might differ from the conclusions made in the previous report, and the results should be interpreted with caution.*

#### Overview

For the three-year period of 1996-1998, 211 recreation-related deaths were identified. Among those deaths, 21 percent (44 deaths) occurred to non-Colorado residents. The annual average death ratio\* was estimated as 1.8 deaths per 100,000 Colorado resident population, which is lower than the annual average ratio of 2.3 deaths per 100,000 Colorado resident population in the previous report. Among the nine recreational categories, the greatest number of fatalities was recorded in the category of climbing/hiking with 37 deaths. Snow skiing was the next most common category with 36 deaths, followed by bicycling with 30 (Figure 1).

Figure 1. Recreational fatalities by type: Colorado occurrences, 1996-1998



\* all occurrences divided by resident population

Overall, males accounted for 82 percent of all recreational deaths in Colorado in the three year period, and persons age 20-39 had the highest number of recreational deaths at 89 (Table 1). About

93 percent of all recreational deaths (196) occurred to white/non-Hispanic people (data not shown). The leading types of recreational fatalities differed by age group (Tables 1 and 2).

**Table 1. Recreational Activity Fatalities by Sex and Age Group: Colorado Occurrences, 1996-1998**

ACTIVITY		TOTAL	FEMALE	MALE	AGE 0-9	AGE 10-19	AGE 20-39	AGE 40-59	AGE 60+
All Activities	N	211	38	173	13	39	89	46	24
	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Climbing/Hiking	N	37	5	32	*	8	26	*	*
	%	17.5	13.2	18.5	*	20.5	29.2	*	*
Bicycling	N	30	5	25	3	8	10	3	6
	%	14.2	13.2	14.5	23.1	20.5	11.2	6.5	25.0
Snow Skiing	N	36	6	30	*	9	16	7	4
	%	17.1	15.8	17.3	*	23.1	18.0	15.2	16.7
Swimming-Nonpool	N	18	*	18	*	3	8	4	*
	%	8.5	*	10.4	*	7.7	9.0	8.7	*
Swimming-Pool	N	8	3	5	4	*	*	*	*
	%	3.8	7.9	2.9	30.8	*	*	*	*
Rafting	N	14	4	10	*	*	*	10	*
	%	6.6	10.5	5.8	*	*	*	21.7	*
Kayaking/Canoeing	N	7	*	7	*	*	7	*	*
	%	3.3	*	4.1	*	*	7.9	*	*
Horseback Riding	N	13	5	8	*	*	4	4	3
	%	6.2	13.2	4.6	*	*	4.5	8.7	12.5
Boating/Water Skiing	N	21	3	18	*	*	10	4	5
	%	10.0	7.9	10.4	*	*	11.2	8.7	20.8
Fishing	N	5	*	5	*	*	*	*	*
	%	2.4	*	2.9	*	*	*	*	*
Hunting	N	5	*	5	*	*	*	4	*
	%	2.4	*	2.9	*	*	*	8.7	*
Other	N	17	7	10	*	4	4	7	*
	%	8.1	18.4	5.8	*	10.3	4.5	15.2	*

\* Indicates fewer than three events in the category.

**Table 2. Three Leading Types of Recreational Fatalities by Age Group: Colorado Occurrences, 1996-1998**

AGE	FIRST	SECOND	THIRD
0-9	Swimming-Pool	Bicycling	*
10-19	Snow Skiing	†Bicycling; Climbing/Hiking	Swimming-Nonpool
20-39	Climbing/Hiking	Snow Skiing	†Bicycling; Boating/Water Skiing
40-59	Rafting	Snow Skiing	†Swimming-nonpool; Horseback Riding; Boating/Water Skiing; Hunting
60+	Bicycling	Boating/Water Skiing	Snow Skiing

\* Indicates fewer than three events in the category.

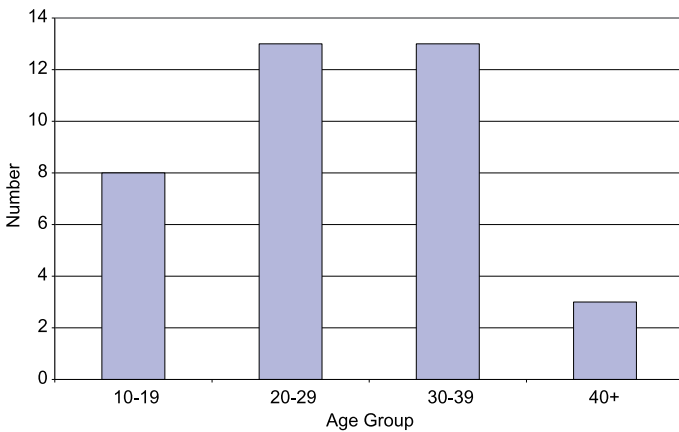
† Tied categories.

Swimming pool fatalities were the most common recreational fatalities for the age group 0-9 at 31 percent of deaths. Snow skiing fatalities were the leading type of death for those age 10-19, while climbing/hiking fatalities were the leading type of death for the 20-39 age group, at 23 percent and 29 percent respectively. For the age group 60 and older, bicycling accounted for the greatest proportion of recreational deaths (25 percent).

### Climbing/Hiking

Although the activities of climbing (i.e., technical rock climbing and/or mountaineering) and hiking can be very different, for the purposes of this study it was not possible to segregate the two types of recreational activity deaths. There were 37 climbing/hiking deaths during 1996-1998 (Table 1). Of the 37 climbing/hiking deaths, 32 (86 percent) were male and 26 (70 percent) were in the 20-39 age group (see Figure 2).

Figure 2. Climbing/hiking fatalities by age group: Colorado occurrences, 1996-1998



The months with the greatest number of climbing/hiking fatalities were July and October with six deaths each, and August with five deaths.

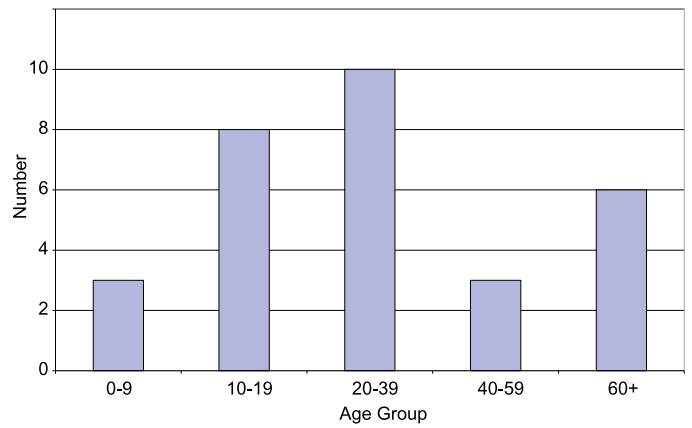
All of the 37 climbers/hikers identified in the current analyses died from falling.

### Bicycling

It was not possible to distinguish between pure recreation and transportation bicycling deaths; therefore, this category includes both types of bicycling injury fatalities. There were 30 bicycling fatalities over the three-year period (Table 1 and Figure 3).

Over 83 percent (25 deaths) of the bicycling deaths were male. Bicycling was the leading type of recreational fatality for people age 60 or older.

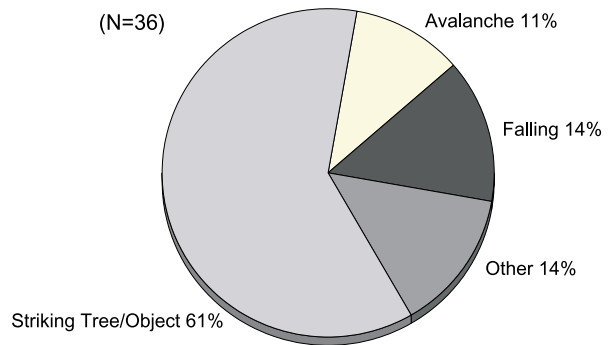
Figure 3. Bicycling fatalities by age group: Colorado occurrences, 1996-1998



### Snow Skiing

This category includes both downhill/alpine and cross-country ski fatalities. There were 36 such deaths recorded in Colorado during the calendar years 1996-1998. Fatal ski injuries were most often caused by the skier hitting a tree or another object (61 percent), falling (14 percent), or being caught in an avalanche (11 percent) (See Figure 4). The majority (69 percent) of snow skiing fatalities were less than 40 years of age. Over 80 percent were male.

Figure 4. Percentage of snow skiing fatalities by type: Colorado occurrences, 1996-1998



### Swimming—Nonpool

Swimming deaths were segregated by pool and nonpool. No boat-related deaths were categorized as swimming (pool or nonpool) deaths in this report. Nonpool fatalities include those in which the decedent was swimming or playing in a lake, reservoir, pond, river, stream, etc.

In the three-year period, there were 18 nonpool swimming deaths, all of whom were male. Eight of these fatalities were in the 20-39 age group. Fifteen of the 18 nonpool swimming deaths occurred during June, July, and August.

## Swimming Pool

This category includes all deaths that occurred in a swimming pool, including those that occurred at a place of residence. There were eight swimming pool fatalities during the three-year period.

Four of the eight swimming pool deaths were to children 0-9 years of age; five were male.

Six swimming pool fatalities occurred at a public place for recreation and sport and/or public building.

## Canoeing/Kayaking and Rafting

For the purposes of this *Brief*, canoeing and kayaking deaths have been grouped together. There were seven canoeing/kayaking-related deaths and 14 rafting deaths.

Seventeen of those who died from canoeing/kayaking and/or rafting accidents were male. Eleven of the 21 fatalities (52 percent) were over 40 years of age.

All 21 canoeing/kayaking and rafting fatalities were caused by accidental submersion and/or drowning.

## Horseback Riding

There were 13 horseback riding fatalities during 1996-1998, ten of which occurred in May through August.

## Boating/Water Skiing

This category does not include those who were fishing from a boat. A separate category (presented below) includes all fishing-related deaths. There were 21 boating and/or water skiing deaths during 1996 through 1998. Of the boating/water skiing fatalities, 48 percent (10 deaths) were 20-39 years of age; 18 of the 21 deaths were male. Of the 21 deaths, 19 occurred in April through August.

Only Jefferson County had more than two (four deaths) fatal boating/water skiing injury occurrences in 1996 through 1998.

## Fishing and Hunting

Five fishing and five hunting deaths occurred over the three-year period. Four of the hunting fatalities were 40-59 years of age and older; all of the fishing and hunting fatalities were male.

**Table 3. Recreational Activity Fatalities: Colorado Occurrences, 1996-1998**

ACTIVITY	RANK	1996-1998		1996		1997		1998	
		N	%	N	%	N	%	N	%
Total		211	100.0	58	100.0	77	100.0	76	100.0
Climbing/Hiking	1	37	17.5	7	12.1	14	18.2	16	21.1
Snow Skiing	2	36	17.1	8	13.8	19	24.7	9	11.8
Bicycling	3	30	14.2	9	15.5	14	18.2	7	9.2
Swimming	4	26	12.3	7	12.1	7	9.1	12	15.8
Swimming-Nonpool		18	8.5	6	10.3	4	5.2	8	10.5
Swimming-Pool		8	3.8	*	*	3	3.9	4	5.3
Canoeing/Kayaking/Rafting	†5	21	10.0	8	13.8	6	7.8	7	9.2
Rafting		14	6.6	6	10.3	3	3.9	5	6.6
Kayaking/Canoeing		7	3.3	*	*	3	3.9	*	*
Boating/Water Skiing	†5	21	10.0	7	12.1	6	7.8	8	10.5
Horseback Riding	6	13	6.2	3	5.2	6	7.8	4	5.3
Fishing	7	5	2.4	3	5.2	*	*	*	*
Hunting	7	5	2.4	*	*	*	*	*	*
Other		17	8.1	4	6.9	*	*	11	14.5

\* Indicates fewer than three events in the category.

† Tied categories.

## Summary

While unintentional injuries continue to kill over 1,400 Coloradans each year, only about 5 percent of unintentional injury deaths occurred during recreational activities. In contrast, motor

vehicle injuries accounted for approximately 45 percent of all unintentional deaths.

## References

- 1 Health Statistics Section, Colorado Department of Public Health and Environment. *Recreational Fatalities in Colorado, 1993-1995*. Denver, CO, 1996.
- 2 Health Statistics Section, Colorado Department of Public Health and Environment. *Colorado Vital Statistics, 1997*. Denver, CO, 1999.