COLORADO

Child Fatality Review Committee

BRIEF

June 2000

The third in an ongoing series of brief reports on Colorado Child Fatality Review Committee findings

Accidental Drowning Fatalities Colorado Children, 1993-97

The Colorado Child Fatality Review Committee (CFRC) reviews all child deaths (ages 0-17) that occur in Colorado each year. Cases are identified by death certificate data from the Colorado Department of Public Health and Environment's Health Statistics and Vital Records Program. All deaths occurring in Colorado to both residents and non-residents are included. Because criteria may differ from those used in other reports, these data may not match other statistics reported on both state and national levels.

In addition to the death certificate, information is obtained as needed to complete each case review. This information may include reports related to the death investigation or to the child's background. In some cases, newspaper articles have been found to be consistent with official reports and have been used to supplement available information.

Between 1993 and 1997, 80 children died in the State of Colorado as a result of accidental drownings. In addition, there were three intentional drownings and one of undetermined manner. For the purposes of this brief, only accidental drownings have been reviewed.

Demographics

Seventy-four percent of the 80 drownings were males. Table 1 shows males have more than twice the drowning rate of females (2.3 per 100,000 resident population compared to 0.9 per 100,000). The distribution of fatalities by race/ethnicity (Table 2) shows the rate for Hispanic children is 2.3 per 100,000, the rate for white non-Hispanic children is 1.4 per 100,000, and the rate for children in the 'other' race/ethnicity category is 2.0 per 100,000. None of the differences in rates between the different ethnic groups were found to be statistically significant.

Table 1: Accidental Drownings by Gender
Colorado, 1993-1997, 0-17 years

Gender	Number	Percent	Rate*
Male	59	73.75%	2.3
Female	21	26.25%	0.9

*Deaths to resident and non-resident children under 18 per 100,000 Colorado population under 18 (1998-based population estimates)

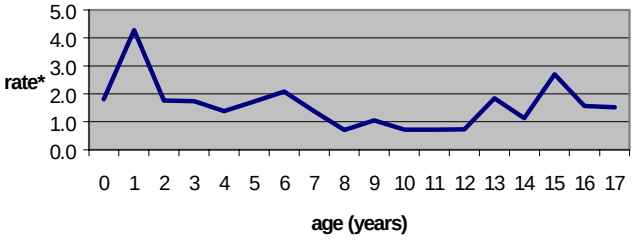
Table 2: Accidental Drownings by Race/Ethnicity
Colorado, 1993-1997, 0-17 years

Race/Ethnicity	Number	Percent	Rate*
White, non-Hispanic	53	66.25%	1.4
Hispanic	19	23.75%	2.3
Other †	8	10%	2.0

*Deaths to resident and non-resident children under 18 per 100,000 Colorado population by race/ethnic group under 18 (1998-based population estimates)

† Includes Black, American Indian and Asian children

Figure 1
Age Specific Accidental Drowning Rates
Colorado, 1993-1997, 0-17 years



*Deaths to resident and non-resident children under 18 per 100,000 Colorado population under 18 (1998-based population estimates)

It is important to note there is a large difference in rates among various ages (Figure 1). The largest number of child deaths occurred in the one-year-old age group. This group had 12 drowning fatalities in five years, accounting for 15% of all drowning deaths. The rate for one-year-old children is more than twice that of all other age groups, with the exception of 15-year-olds (4.3 per 100,000 and 2.7 per 100,000, respectively). Overall, children four years of age and under accounted for 31 deaths, or 39% of all fatalities. The rate for children four years of age and under was 2.2 per 100,000 compared to 1.4 per 100,000 for children over four years of age. Rates for all ages are shown in Figure 1.

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Location of Drownings

The majority of drownings in Colorado occurred in outdoor, open bodies of water (Figure 2). Included in open bodies of water are lakes, ponds, reservoirs, rivers, creeks, and irrigation ditches.

Prevention Strategy
Children should never be allowed to play in creek beds or irrigation ditches.

Outdoor Drownings

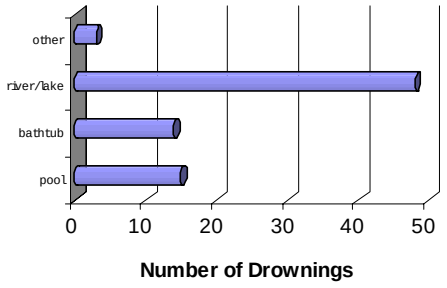
Outdoor open bodies of water accounted for 60% of all drownings between 1993 and 1997. These have been broken down into six categories in Table 3.

Table 3: Outdoor Drowning Occurrences by Category Colorado, 1993-1997, 0-17 years

Category of Incident	Number	Percent
Irrigation ditches	14	29%
River recreation	10	21%
Lake/Pond recreation	7	14.5%
Found submerged in water	13	27%
Slipped/Fell into water with adult present	3	6%
Other	*	

*less than three events

Figure 2
Drownings in Colorado by Location
Age 0-17 years, 1993-1997, n=80



Irrigation ditches accounted for the largest number of open body of water drowning deaths. Five drowning victims (36%) were children ages two-to-five and six (43%) were children ages six-to-twelve. In children less than five years old, drownings frequently occurred when the child wandered off and was reported missing for less than ten minutes. Drownings pose a problem particularly in rural areas, where irrigation ditches are easily accessible. These are not bodies of water that are frequently fenced or monitored. None of the children who died in irrigation ditches were under direct adult supervision at the time the incident occurred**.**

Prevention Strategy
Rivers and streams have undercurrents that are extremely dangerous and are not always visible.
These are not safe places for children to play.

River and lake recreation accounted for a total of 17 drownings. The majority of children (80%) who died in river recreation incidents were teens between the ages of 13 and 17 years. Teens also accounted for the majority of pond/lake recreation drownings (71%). Of the children who died in river recreation incidents (including fishing, wading, swimming and rafting) none were wearing personal flotation devices (life jackets). Out of the seven children who died in lake recreation incidents, including boating and swimming incidents, those that were wearing life jackets lost them while submerged, either because they were not fastened properly or because they were too large.

Prevention Strategy
Always wear a Cost Guard-approved life-jacket when on a boat, jet ski, or near open bodies of water ('water-wings' or other air-filled swimming aids are not safe substitutes for life-jackets).

The category 'found submerged in water' includes all children who were discovered to be missing and later found drowned in a river, lake, or pond. These drownings were not recreation-related incidents. The category also includes numerous toddlers who were reported missing for less than five minutes and wandered into bodies of water.

Bathtub Drownings

There were 14 bathtub drownings. Four of these deaths (29%) were infants under the age of one year. Additionally, four toddlers (under the age of 24 months) drowned in the bathtub. All of these drownings occurred in the absence of adult supervision. The remaining six bathtub drownings were children and adolescents between the ages of 2 and 17 who had a medical history of seizures and all may have had a seizure prior to drowning.

Prevention Strategy
Children and adolescents with a history of seizures should be monitored during bathing.

Pool Drownings

Forty percent (6 incidents) of all pool drownings occurred in the presence of a supervisor. Another 40% of the pool drownings occurred when children went swimming unsupervised. Many of these pools were located at hotels and apartment complexes and although they had fences and gates, none were locked.

Prevention Strategy
Install four-sided fencing, at least 5 feet high, equipped with self-closing, self-latching, and locking gates, that completely surrounds the pool.

Urban and Rural Differences

There was a large difference in both the drowning rates and location of drowning between urban and rural areas (Table 4). While all geographic areas had the largest percentage of drownings occur in outdoor open bodies of water, the rural areas were over represented. Rural areas also had a much higher drowning rate compared to urban areas (2.73 per 100,000 versus 1.16 per 100,000).

Table 4: Location of Fatalities by Geographic Area
Colorado, 1993-1997, 0–17 years

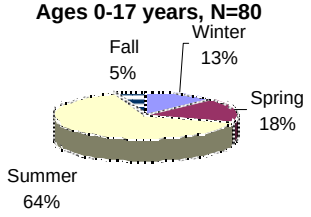
Geographic Area	Percentage of Drownings Occurring in Pool	Percentage of Drownings Occurring in Bathtub	Percentage of Drownings Occurring in River/Creek/Lake	Rate*
Denver Metro (n=32)[1]	22%	31%	44%	1.2
Other Metro (n=26)[2]	23%	8%	65%	1.8
Rural (n=22)	9%	9%	77%	2.7

[1] Includes Adams, Arapahoe, Boulder, Denver, Douglas and Jefferson counties
[2] Includes El Paso, Larimer, Mesa, Pueblo, and Weld counties
*Deaths to resident and non-resident children under 18 per 100,000 Colorado population by geographic area under 18 (1998-based population estimates)

Month of Drowning

Drownings reported by month were aggregated by season (Figure 3). The majority of drownings in Colorado occurred during the summer months (52 drownings, 64%) of June through August. However, six outdoor drownings did occur during the winter months of December through February, which emphasizes that water safety should be a year-round concern. Bathtub drowning occurrences were evenly distributed throughout the year.

Figure 3
Drownings by Season, Colorado 1993-1997
Ages 0-17 years, N=80



Prevention

Drowning usually happens quickly and silently. Two minutes following submersion, a child will lose consciousness and irreversible brain damage occurs after four to six minutes. Targeting high-risk groups using specific prevention strategies could help reduce the incidence of drowning.

Infants and toddlers account for a large percentage of the drowning deaths (39%) which most frequently occur when the child is unsupervised. Children at these ages are very curious and mobile. It doesn't take long for a young child to wander off and get into a dangerous situation. Infants and small children should never be left alone in the bathtub. All the infants who drowned were left unsupervised. It is necessary to limit young children's access to water. Pools and irrigation ditches pose a particular danger due to the potential for easy access. Adults need to be aware of the hazards and monitor children in and around water at all times.

Prevention Strategy
Never leave a child unsupervised in or around water.

Teenagers are risk takers. Teen drownings often occurred during recreational activities in a river or lake. The use of personal flotation devices (PFD) is critical to saving lives. None of the children who died in rivers or lakes were wearing a properly fitted or fastened personal floatation device. Particularly in Colorado, children need to be educated about the dangers of rivers. While a river may appear to be a safe place to play or swim, there is often a very dangerous undertow present and it takes only seconds to be swept away. Alcohol and drug use could also be factors in this age group. There were several drowning incidents among teens where significant amounts of alcohol and/or drugs were found to present in a post-mortem autopsy.

Conclusions

Drownings are not random, unpredictable events. Through examination of statistics, it is clear as to when, where, and to whom drownings are most likely to happen. Through education and prevention strategies, these unnecessary deaths can be prevented.

The prevention tips provided throughout this brief are not new. However, all too often, it is a small lapse in supervision or in judgement that leads to the fatal event. Adults cannot foster the attitude that drowning will not happen to their child. As role models for children, adults must take the responsibility for protecting them and teaching them to protect themselves as they grow older. It is important to realize that Colorado has some unique drowning issues. Outdoor recreation is a popular pastime in Colorado and many people underestimate the potential hazards.

Understanding how drownings occur will aid in our prevention efforts. The choices we make can save a child's life.

Web Sites of Interest

Colorado Child Fatality Review Committee	http://www.cdphe.state.co.us/pp/cfrc
American Red Cross	http://www.redcross.org/
United States Coast Guard	http://www.uscg.mil/
National SAFE KIDS Campaign	http://www.safekids.org/

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The Colorado Child Fatality Review Committee (CFRC) is a multidisciplinary team which has been reviewing all child deaths that occur in Colorado since 1989. The goals of the committee include describing patterns of child death in Colorado, identifying the prevalence of risk factors for child death, characterizing high-risk groups in terms compatible with the development of public policy, evaluating system responses to children and families who are at high risk and offering recommendations for improvement in those responses, and improving the quality of data necessary for child death investigation and review. A fundamental purpose of the review process is the development and implementation of prevention strategies that are suggested by the in-depth review of the circumstances of each child fatality. See CFRC web site for further information about CFRC.

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