**Injury Epidemiology**
**Injury Information for Colorado**

# Injury Epidemiology Brief

## Traffic Safety Facts

## Colorado Children Ages 4 to 8

## January 2003

**Colorado Department of Public Health and Environment**

Children ages 4-8 represent a special concern for motor-vehicle occupant protection. Children in this age group frequently sit unrestrained or are placed prematurely in adult seat belt systems. Public health and traffic safety organizations recommend that children in this age group who have outgrown child safety seats should be restrained properly in booster seats until they are at least eight years old, unless they are 57 inches tall.[1] Recent data have documented that young children in seat belts are over three times more likely to be injured in a crash than children in age-appropriate restraints. [2,3]

In Colorado from 1999 to 2001, motor vehicle traffic crashes were the leading cause of death and the second leading cause of injury hospitalizations for children ages 4-8. Motor-vehicle crashes were responsible for 41 percent of all injury deaths and 20 percent of all injury hospitalizations for children ages 4-8.[4]

From 1996 to 2001, 21 children ages 4-8 were killed in motor-vehicle occupant traffic crashes (an average of four children killed each year).[4] More than half (58 percent) of the children who died were unrestrained at the time of the motor-vehicle crash, while 31 percent were using an adult seat belt system, and none were in car seats/booster seats.[5]

From 1996 to 2001, 386 children ages 4-8 were hospitalized in Colorado for injuries sustained as an occupant in a motor-vehicle traffic crash (an average of 64 children hospitalized each year).[4]

In Colorado, the motor-vehicle occupant death rate for children ages 4-8 has not changed significantly from 1990 to 1999. Nationally, however, the death rate for 4-8 year olds has increased three percent from 1991 to 2000.[6] During this same time period, the vehicle miles traveled (VMT) by passenger vehicles has increased nearly 25 percent. When measured using VMT, the national death rate per VMT for children ages 4-8 has dropped 18 percent, with most of the improvements occurring from 1999 to 2000.[7]

**Figure 1. Body region of injury, for Colorado children ages 4-8 hospitalized for injuries sustained as a motor-vehicle occupant, 1996-2001** [4]


Note: Moderate to life-threatening injuries are represented. A child may have injuries in more than one body region.

## Self-reported booster seat use in Colorado [8]

The Colorado Behavioral Risk Factor Surveillance System (BRFSS) is an ongoing statewide telephone survey designed to monitor the prevalence of health behaviors and preventive health practices associated with the leading causes of premature death disability and disease. Adults in Colorado were asked to self-report on the restraint use for children ages 4-8 living in the household.

**Table 1. Prevalance of restraint use by selected characteristics for Colorado children ages 4-8, BRFSS 2001**

| | Sample size | Percent | 95% confidence interval | |
|---|---|---|---|---|
| | | | Lower limit | Upper limit |
| **Frequency of restraint use** | 371 | | | |
| Always | | 85.8 | 82.0 | 89.6 |
| Nearly always | | 8.4 | 5.3 | 11.5 |
| Sometimes | | 0.7 | 0.1 | 1.8 |
| Seldom | | 0.2 | 0.0 | 0.9 |
| Never | | 4.9 | 2.6 | 7.2 |
| **Type of Restraint** | 316 | | | |
| Lap belt | | 13.8 | 9.7 | 17.9 |
| Lab/ shoulder belt | | 56.1 | 50.1 | 62.1 |
| Child car seat | | 13.4 | 9.4 | 17.4 |
| Booster seat | | 15.4 | 11.1 | 19.7 |
| Other | | 1.3 | 0.1 | 2.5 |

Adults reported that 86 percent of the 4-8 year olds in their household always use a restraint while riding in a vehicle (Table 1).

Of those who always use a restraint, 15 percent use a booster seat. Booster seat use in the 4-5 year old age group is significantly higher than use in the 6-8 year old age group. There is no statistically significant difference in use between rural and urban areas or by household income (Table 2).

There are two reasons that this survey may overreport the use of booster seats. An adult answering the survey may not understand the definition of a booster seat. In addition, it is known that the results of self-reported surveys are generally higher than results found in observational surveys. [9]

Almost 14 percent of children ages 4-8 use a lap belt only as their restraint system. Often this is the only restraint available in the rear seat of older vehicles and the middle seat of some newer vehicles. For example, an estimated 29 percent of registered vehicles in El Paso County and 43 percent in Mesa County were manufactured before 1989.[10] This is a problem since a booster seat must be used with a lap/shoulder belt combination. The solutions to the dilemma for these families are limited and often expensive.[11]

**Table 2. Prevalance of booster seat use, by selected characteristics for Colorado children ages 4-8, BRFSS 2001**

| | Sample size | Percent | 95% confidence interval | |
|---|---|---|---|---|
| | | | Lower limit | Upper limit |
| **Age** | | | | |
| 4 | 70 | 24.5 | 14.2 | 34.8 |
| 5 | 66 | 24.1 | 12.5 | 35.7 |
| 6 | 67 | 17.0 | 7.3 | 26.7 |
| 7 | 56 | 8.5 | 0.3 | 16.7 |
| 8 | 57 | 3.6 | 0.4 | 9.9 |
| **Age Groups*** | | | | |
| 4-5 year olds | 136 | 24.3 | 16.6 | 32.0 |
| 6-8 year olds | 180 | 9.8 | 5.1 | 14.5 |
| **Region** | | | | |
| Urban | | 15.6 | 10.9 | 20.3 |
| Rural | | 15.0 | 4.8 | 25.2 |
| **Household income** | | | | |
| <$25,000 | | 17.6 | 7.6 | 27.6 |
| $25,000 + | | 15.1 | 10.2 | 20.0 |

* statistically significant difference by age group

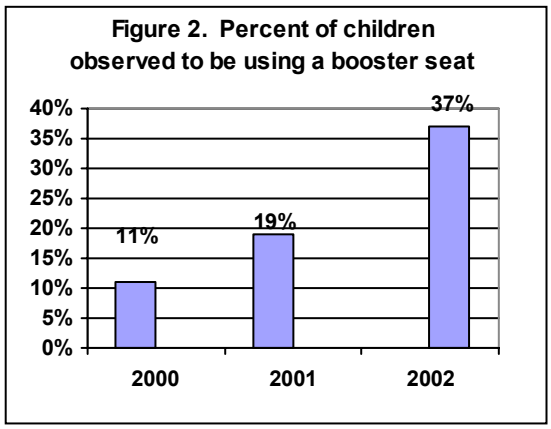
*Note: The BRFSS survey was initiated in 1990 as a joint project of the Colorado Department of Public Health and Environment, and the Centers for Disease Control and Prevention. For this project approximately 170 Colorado residents ages 18 years and older were interviewed, using random digit dialing techniques, by telephone each month in 2001. The randomly selected adult respondent from the household was asked to self-report on the restraint use for children ages 4-8 living in the household. Data collected over an entire year were combined to develop statewide estimates of restraint use. All percentages shown have been weighted to reflect the probability of selection.*

## Special report-Colorado Springs

In October 2000, the Colorado Department of Public Health and Environment (CDPHE) and DRIVE SMART Colorado Springs started a three year Booster Seat Promotion Project with funding from the Centers for Disease Control and Prevention (CDC). Additional data were collected during the course of the project.

### Observational booster seat survey

A survey involving observation of over 400 children ages 4-8 at 27 sites in Colorado Springs is being used to monitor progress in increasing booster seat use in the community.




There was a significant increase in booster seat use from December 2000 to 2002.

Most children (75-88 percent) were restrained in some manner (car seat, seat belt), and 42 percent of the children who were restrained were using booster seats in 2002.

**Driver use of a seat belt was very important!** If the driver wore a seat belt, 99 percent of the children were restrained. If the driver was NOT wearing a seat belt, only 44 percent of the children were restrained.

In a comparison community, a booster seat use observational survey revealed an increase between 2000 and 2002 from three to seven percent. Other surveys from around the country report booster seat use to be from five to 25 percent.[12]

### Colorado Springs Memorial Hospital data[13]

From January 1999 through July 2002, 41 children ages 4-8 were admitted to the hospital due to injuries received as an occupant in a motor-vehicle crash.

Eleven (27 percent) of the children were not restrained, and 21 (51 percent) were restrained in seat belts (seven of these were in lap belts and 14 in lap/shoulder belts). Only four (10 percent) were restrained in either a car seat or a booster seat, and all of these were four or five year olds.

Weight or height information was available for 35 of the children. Based on this information, two were appropriately in car seats. Of the 16 children in seat belts, five should have been in a car seat, and 11 should have been in booster seats.

Safety experts recommend that all children under age 12 ride in the rear seat.[14] From the Memorial Hospital data, 17 percent of the injured children were riding in the front seat. Five children were in the front seat of a vehicle known to have a passenger side air bag. [13]

### SAFE KIDS checkpoint information[15]

From October 2000 through September 2002, a total of 334 children ages 4-8 were seen at the Colorado Springs SAFE KIDS car seat/safety belt checkpoints. One hundred seventeen of those children (35 percent) were in booster seats and 98 (29 percent) were in forward facing car seats. One hundred fifteen (34 percent) of the children were using a seat belt only, and almost all of those children should have been in a booster seat.

## Colorado's revised child passenger safety law

Colorado's child restraint law was strengthened in 2002 by requiring four and five year olds to ride in booster seats. The new section of the law takes effect on August 1, 2003. Citations will begin on August 1, 2004; the fine is $56.

The law includes the following requirements:

Children less than one year old and weighing less than 20 pounds must be properly restrained in a rear-facing child restraint system. Children who are one to four years old and weigh more than 20 pounds but less than 40 pounds, must be properly restrained in a forward-facing child restraint system. This updates Colorado's original child safety seat law passed in 1984.

Children who are four or five years old and less than 55" tall must be properly restrained in a child booster seat or with a child safety belt-positioning device. Children who are six through 15 years old must be properly restrained in a seat belt.

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