

# Identification of Safety Belt Restraint Usage Characteristics Related to Four- to Thirteen-Year-Olds

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## **Introduction**

Even though overall level of safety on United States roadways has improved over the last few decades because of significant vehicle and occupant safety regulations and programs, further improvement is needed. In 2009, 33,808 fatalities and another 2.2 million injuries were reported on U.S. roadways due to motor vehicle crashes. Ninety percent of victims in traffic crashes were occupants, accounting for 24,474 fatalities in 2009 (NHTSA 2009b). Injuries to occupants of motor vehicle crashes claim the lives of more people between five and 34 years of age than any other cause of injury (CDC 2010). An average of four children, 14 years and younger, are killed and 490 are injured each day in United States (U.S.) traffic crashes, based on 2009 statistics. Child passengers are innocent victims in crashes because they may not be the decision makers for the trips or any other factors associated with the trip (NHTSA 2009b). Involvement in road traffic crashes as vehicle occupants is a leading cause of death and serious injury among children.

## **Project Objective**

The objective of this study was to investigate child safety restraint-use characteristics and crash-severity factors in order to identify effective countermeasures to increase children's safety.

## **Project Description**

Crash data were obtained from the Kansas Department of transportation from 2004 to 2008 for this study. Children were divided into two groups, ages four to seven and eight to 13, considering Kansas child-restraint laws. Detailed frequency analysis was carried out. Frequencies, percentages, and odds ratios were used to investigate restraint-use characteristics, seating positions, and injury severity. Logistic regression models were developed to identify risk factors which increased injury severity.

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## Project Results

About 3% of children ages four to seven years children group and about 4% of eight to 13 year olds were not restrained. Restraint use among children involved in crashes decreased with increasing age of the child, or number of other occupants in the vehicle. Further, data were analyzed with the Chi-Square test of independence to see whether there was a relationship between restraint use and other variables.

Results showed children not restrained, riding with drunk drivers, and riding in older vehicles were more vulnerable for injuries when they were in crashes. The most frequent contributory causes related to children involved in crashes in Kansas were inattention in driving, failure to yield right of way, driving too fast, wet roads, and animals in the road. Based on the identified critical factors, countermeasures to improve child traffic safety were suggested which included age- and size-appropriate seat belt restraints, and the child being in the rear seat. It is important for parents and children to gain better education about these safety measures that are helpful to increase child safety on the road.

## Project Information

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