U.S. Department
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Research Notes

Lives Saved by Child Restraints from 1982 through 1987

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Estimates derived from the Fatal Accident Reporting System (FARS) indicate that restraints are very effective in preventing infant (under one year old) and toddler (one through four years old) fatalities. It is estimated that fatality reductions from restraint use between 1982 and 1987 were:

69 percent for infants in child safety seats,
47 percent for toddlers in child safety seats, and
36 percent for toddlers in adult belts.

Because many restraints are incorrectly or incompletely used (as reported from detailed observation surveys), potential effectiveness is probably higher than the estimates provided here.

As child restraint use has increased, the annual number of lives saved has also increased. Based on the methods described here, child safety seats and adult belts used by infant and toddler passenger vehicle occupants saved an estimated:

75 lives in 1982,
105 lives in 1983,
126 lives in 1984,
153 lives in 1985,
166 lives in 1986, and
213 lives in 1987.

If all young children used child restraints, more lives could be saved. With 100 percent use, child seats (with the mix of correct and incorrect use during 1982 through 1987) could have saved an estimated:

369 lives in 1982,
380 lives in 1983,
355 lives in 1984,
378 lives in 1985,
405 lives in 1986, and
462 lives in 1987.

If child seats are to achieve anything like this potential, they must be used by children involved in serious crashes.

Data

Between 1982 and 1987 there were 7,060 vehicles reported to FARS that met the following three criteria. First, they were passenger cars built after front seat lap and shoulder belts were required (model years 1974 and later). Second, they had a driver for whom restraint use was reported. And third, they had a young child passenger (under five years old) for whom restraint use and type (adult belts or child safety seat) was reported. The definitions used to select and classify these cases are described in the report.

Method

This paper uses the matched-pairs technique described in detail by Leonard Evans (for example, in "Driver Fatalities versus Car Mass Using a New Exposure Approach," Accident Analysis and Prevention, Volume 16, Number 1, 1984) and used by him in a variety of studies of fatal accidents. This technique has been used in previous agency analyses of child restraints ("Restraint Use and Fatality Risk for Infants and Toddlers," Susan Partyka, 1984; "An Evaluation of Child Passenger Safety: The Effectiveness and Benefits of Safety Seats," Charles Kahane, 1986). It is described, with examples, in the report.

Discussion

Child restraints could save many more lives, but use is still low in serious accidents. Observations taken at shopping centers in nineteen cities indicate that about 80 percent of young children (under five years old) who visited these centers in 1987 were in child safety seats. In contrast, only 24 percent of young children who survived a fatal accident were in child safety seats. Observations taken by individual states produce results that vary widely between these two extremes. Despite the effectiveness of child restraints and the widespread use of safety seats in some areas, children in serious crashes are still all too often unprotected. This situation is similar to that of the high risk adult population, who are less likely to use safety belts than is the general population.

It is important to reconcile the child restraint benefits (realized and potential) estimated here with the prevalent child safety seat use reported in some observation surveys. It is estimated that 213 children were saved by restraints in 1987, but that 462 could have been saved if all young children had used child safety seats. This implies that many children were unrestrained in accidents. It is estimated that only a half of all young children who survived a fatal traffic accident were using any kind of restraint in 1987.

In contrast, observations taken by the agency's 19-Cities Survey (managed by the Office of Driver and Pedestrian Research) indicate that restraint use near the shopping centers included in the survey was much higher. By 1987, the survey was reporting that four-fifths of young children (both infants and toddlers) were restrained.

It seems clear that children observed in the 19-Cities Survey are not representative of children involved in serious accidents. This may be for either of at least two reasons. First, children in the areas surveyed may not adequately represent young children in traffic in all areas of the country. And second, young children in traffic may not adequately represent young children who become involved in serious accidents. These two possibilities are discussed further below.

First, the 19-Cities Survey of young children is based near shopping centers to increase the numbers observed. The survey may tend to include people who can afford to buy child restraints and to exclude people who feel they can only afford to put their children in the available adult seat belts. People for whom child restraints are very expensive may tend to shop elsewhere. The result would be an overestimate of child restraint use in traffic. The cost of the child restraint may be a particular problem for toddlers because they are less accessible to maternity-based information and loaner programs than they were as newborns.

This possibility is partially supported by child restraint use reported by individual states. Some states (such as California and North Carolina) report high rates of child restraint use, comparable to the rates observed by the 19-Cities Survey. However, many other states report child restraint use rates of less than 40 percent.

Second, it has been observed that adult restraint use in accidents is lower than restraint use observed in traffic. It is likely that child restraint use is also lower in serious accidents than it is in general traffic. People who put young children in child restraints may tend to get into fewer and less-serious accidents than people who drive with unrestrained children. The result would be optimistic estimates of child restraint use in accidents from the observation data. The unrestrained children in the observation surveys may be at greater risk of becoming involved in a serious accident than are the restrained children.

This possibility is partially supported by accident data. Restraint use by children who survived a fatal accident in 1987 was slightly higher in urban areas and during the day than in rural areas and at night. These conditions of higher child restraint use correspond to 19-Cities Survey observation conditions.

In summary, it appears clear than restraint use in accidents is much lower than reported in observation surveys, particularly in the agency's 19-Cities Survey. While child restraint use has increased over the last five years, most children in serious accidents are still unprotected. Further fatality reductions will require greater use of child safety seats where they are most needed -- in serious crashes.

The details of the study (data, method, and discussion) are provided in the complete report, "Lives Saved by Child Restraints from 1982 through 1987," by Susan C. Partyka. Copies are available from the National Center for Statistics and Analysis (NRD-30), NHTSA, 400 Seventh Street S.W., Washington, D.C. 20590.

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