

USE AND MISUSE OF CHILD RESTRAINT DEVICES IN MICHIGAN

David W. Eby

Lidia P. Kostyniuk

University of Michigan Transportation Research Institute

United States

Paper Number 98-S10-O-07

ABSTRACT

This paper provides an overview of a statewide survey of child restraint device (CRD) use and misuse in Michigan. The study found that about 75 percent of children under the age of four were in a CRD and that CRD use generally followed the safety belt use patterns of the drivers. The study also found that when a CRD was used, nearly 90 percent of the time an error was made in either how the CRD was placed in the vehicle or how the child was placed in the CRD. Patterns of misuse are discussed as well as some ideas for improving correct use.

INTRODUCTION

In 1996, 88,000 children under the age of five years were killed or injured in motor vehicle crashes in the United States (NHTSA, 1997). Use of a child restraint device (CRD) has been identified as an effective means for reducing death and injury in the youngest group of motor vehicle occupants. In order to encourage use of CRDs, most states have passed mandatory CRD use laws (Insurance Institute for Highway Safety, 1995). However, because of the difficulties in finding target-age children (those under four years of age) in high enough concentrations, no state had previously conducted a statewide survey of CRD use to determine the effectiveness of their law. Instead, states have limited their surveys to cities or regions. Thus the purpose of the present work was to determine a statewide CRD use rate for Michigan. At the same time, determining a statewide CRD use rate may not capture the entire CRD use picture. Nonstatewide studies have found that even when CRDs are used, misuse is high (e.g., Bolton & Dale, 1996; Decina & Knoebel, 1996; Margolis, Wagenaar & Molnar, 1992). Thus, a secondary objective was to determine frequency with which CRDs are misused and the patterns of this misuse.

METHODS

CRD use was determined by observing use in vehicles entering the facilities at 88 randomly selected

day care and pediatric centers around the state of Michigan. In addition to CRD use, observers also recorded driver age category, sex, belt use, and several other variables. CRD misuse was determined by interviewing drivers of vehicles with a child in a CRD and by inspecting how the CRD was installed in the vehicle and how the child was secured in the seat at 28 randomly selected day care centers around Michigan. This part of the study was conducted as a pilot for use in designing a more detailed study of CRD misuse in Michigan.

RESULTS

Child Safety Seat Use Rates

The estimated child restraint device use rate for the state of Michigan was 74.5 ± 3.7 percent of all children under four years of age (i.e., target-age children) traveling in passenger cars, pickup trucks, sport utility vehicles, and van/minivans during the summer of 1997.

The estimated CRD use rate varied by driver belt use. When the driver was using a safety belt, target-aged children were in CRDs 80.8 percent of the time. If the driver was not belted, children were in CRDs only 51.8 percent of the time. While not surprising, this result suggests that continued efforts to increase safety belt use may also increase the frequency with which CRDs are used.

The analysis of CRD use by the sex of the person driving the vehicle in which the child was observed showed that women drivers (75.0 percent) tended to have target-age children in CRDs more often than men drivers (67.1 percent). Since surveys have consistently shown that safety belt use rates for women are generally about ten percentage points higher than men (see Kostyniuk, Molnar, & Eby, 1996 for a review of Michigan drivers), this sex difference observed in the present study may be related to the higher safety belt use of women. Further information on the CRD use results can be found elsewhere (Eby, Kostyniuk, & Christoff, 1997).

Child Restraint Device Misuse

Because this portion of the study was designed as a pilot test of CRD misuse data collection, a total of only 87 driver interviews and CRD inspections were conducted. While small, this number is sufficient to determine some statewide trends.

The large majority of drivers were female (86.2 percent), had at least some college education (80.4 percent), were married (89.7 percent), and believed that the CRD and child were correctly placed in the vehicle (96.6 percent). The majority of drivers (67.8 percent) acquired the CRD through self-purchase. Most drivers (71.3 percent) reported that they learned to install the CRD in the vehicle by reading manufacturer instructions, whereas none of the drivers used this information in learning how to secure the child in the CRD. Instead, most felt that placing the child in the CRD was "obvious" and either they or a family member (88.5 percent) simply figured it out on their own.

Overall the CRD misuse rate was 88.5 percent. This rate includes all vehicles in which at least one type of misuse was found in placing the child in the CRD or installing the CRD in the vehicle. This very high misuse rate is in agreement with the results of several other studies (e.g., Bolton & Dale, 1996; Decina & Knoebel, 1996; Margolis, Wagenaar, & Molnar, 1992).

The analysis of the specific errors people made with CRDs revealed several interesting patterns. First, errors, regardless of severity, were more common when placing the child in the seat than when installing the seat in the vehicle. This is, perhaps, not surprising since a large majority of drivers reported that they learned to put the child in the seat without using instructions from others or the CRD manufacturer. Many reported that placing the child in seat was "obvious." This finding suggests that educational efforts should strongly focus on the process of securing the child in the CRD, emphasizing that it may not be as self-evident as it appears. Second, certain kinds of misuse were common while others were infrequent. The most common problems were related to the tightness of fit; that is, securing the seat to the vehicle and strapping the child in the seat. Neither of these types of misuse could easily be corrected through verbal instruction. Rather, both would seem to require hands-on demonstration. Similarly, high misuse rates were found for items related to the safety belt locking clip and the harness positioning clip. Again, the proper use of both is difficult to convey through verbal means. With regard to infant seats, we found that the majority of parents left the infant-seat carrying handle

inappropriately in an upright position. Finally, among the CRDs that we inspected none were placed inappropriately in the rear-facing position in a seat with an air bag. It appears that recent warning about this type of misuse have been effective. More detailed information on misuse patterns can be found in elsewhere (Eby, Kostyniuk, & Christoff, 1997).

ACKNOWLEDGMENTS

Carl Christoff, Michelle Hopp, Hans Joksch, Lisa Molnar, and Fredrick Streff assisted on this project. This work was sponsored by the Michigan Office of Highway Safety Planning (OHSP) The opinions, findings, and conclusions expressed here are those of the authors and not necessarily those of OHSP

REFERENCES

- Bolton, S.L. & Dale, A. (1996). *Child Car Safety Seat Use/Misuse in Orange County*. Orange County, CA: County of Orange Health Care.
- Decina, L.E. & Knoebel, K.Y. (1996). *Patterns of Misuse of Child Safety Seats*. Malvern, PA: Ketron Division of the Bionetics Corporation.
- Eby, D.W., Kostyniuk, L.P., & Christoff, C. (1997). *Child Restraint Device Use and Misuse in Michigan* (Report No. UMTRI-97-36). Ann Arbor, MI: UMTRI
- Insurance Institute for Highway Safety (1995). *Child Restraint, Belt Laws*. Arlington, VA: Insurance Institute for Highway Safety.
- Kostyniuk, L.P., Molnar, L.J., & Eby, D.W. (1996). Are women taking more risks while driving? A look at Michigan drivers. *Proceedings of the Second National Conference on Women's Travel Issues*. Baltimore, MD.
- Margolis, L.H., Wagenaar, A.C., & Molnar, L.J. (1992). Use and misuse of automobile child restraint devices. *American Journal of Disabilities of Children*, **146**, 361-366.
- National Highway Traffic Safety Administration. (1997). *Traffic Safety Facts 1996*. (World Wide Web Document (<http://www.nhtsa.dot.gov>)). Washington, D.C.: NHTSA