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November 11, 2020

Docket Management Facility, M-30
U.S. Department of Transportation
West Building, Ground Floor, Room W12-140
1200 New Jersey Avenue S.E.
Washington, D.C. 20590

RE: Docket NHTSA-2020-0093 FMVSS 213 NPRM Comments

Dear Sir/Madam:

Please accept this letter to your request for comments regarding the proposed rulemaking to amend Federal Motor Vehicle Safety Standards (FMVSS) No. 213.

Basis for changing the minimum child weight for booster usage from 30 to 40 pounds

The NPRM refers to a study entitled, “Booster Seat Effectiveness Estimates Based on CDS and State Data,” performed in 2010 and authored by Robert Sivinski (The Sivinski Study), 85 Fed. Reg. 69388, 69390 fn 9. I have performed a comprehensive statistical analysis evaluating this study. I have presented my evaluations below.

The Sivinski study is an internal, preliminary NHTSA study examining injury risk to children in booster seats compared to children in child restraint seats. The study combined a census of crashes from motor vehicle accident databases from 3 states with a sample of crashes from NASS/CDS data to derive a preliminary conclusion on the injury risk to children in booster seats and child restraint seats.

1. In this study, the author combined unweighted NASS/CDS data with crash data from States to draw conclusions (see Table 1, Tables 7-9). NASS/CDS is a stratified sampling system, which includes in-depth investigations of a sample of crashes, which are used to obtain nationally extrapolated estimates. The crash data from States are a census of police-reported crashes resulting in a fatality, injury or property damage of some amount. It is statistically questionable to simply combine raw, unweighted data from a sampling system (NASS/CDS) with census data from a different data system (e.g., State data), as the sampled data are often biased without the correction of weights. In addition, it is possible that there will be overlap between the States data and the NASS/CDS samples. The study does not mention any attempts being made to remove duplicates.
2. This study is based on small sample sizes, especially for the analyses comparing booster seats with child restraint seats in children ages 3-4. Out of the nine reported effectiveness rates (Tables 7-9) only one rate (KAB, Table 7) appears to be statistically significant with

wide confidence bounds (3 – 57%). The “KAB” injury classification¹ includes non-incapacitating (“B”) injuries. The other eight rates all have wide confidence bounds, with the lower limits being negative, which indicates there can be an injury reduction with booster seats.

3. The study used matched-pair analysis and drivers as a “control” to account for crash severity and other confounding factors. In fact, drivers may differ in many ways (including seat position, age and gender) from subjects, which are the kids in the back rows. Age and gender can affect likelihood of injuries of the occupant while seat position is sensitive to direction of crash. For example, a rear impact is more likely to injure the kids in the back than the drivers in the front, causing the crash severity to be misleading. The paper fails to address these confounding factors, and the matched-pair methodology is flawed.
4. The study used police-reported crash data from three states for this analysis, claiming that these are the three states that have reported booster seat use and have accumulated enough data to conduct the statistical analysis. However, reviewing state data manuals show that Texas, Utah, Oklahoma and Wyoming are also states with reported booster seat use information in the data.
5. The author also identified some of the limitations of this study:
 - a. “Due to sampling methods and data sources the results cannot be considered nationally representative or randomly sampled.”
 - b. There are some inconsistencies on coding of the injured child’s restraint type among the data sources.
 - c. In addition, the author of this study admits (on page 11 of his paper) that, “The analysis comparing booster seats to child restraint seats in children 3 and 4 years old needs more data before drawing any firm statistical conclusions.”

The inherent deficiencies in the methodology and small sample sizes used in the Sivinski study render their conclusions invalid.

Sincerely,



Jeya Padmanaban
President, JP Research, Inc.

¹ KABCO is the observational scale used in police reporting of crash injuries, where: K=killed, A=incapacitating injury, B=non-incapacitating injury, C=possible injury, O=no injury, U=injury, severity unknown