

Comparison of Characteristics and Contributory Factors for Fatal Truck and Non-Truck Crashes using Bayesian Statistical Analysis

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One-ninth of all traffic fatalities in the United States have involved large trucks in the past five years, although large trucks contributed to only 3% of registered vehicles and 7% of vehicle miles travelled. This contrasting proportion indicates that truck crashes in general tend to be more severe than other crashes, though they constitute a smaller sector of vehicles on the road. To study this issue, fatal crash data procured from the Fatality Analysis Reporting System (FARS) was used to analyse characteristics and factors contributing to truck-involved crashes. Driver, vehicle, and crash-related contributory factors were identified, and as an extension, the likelihood of occurrence of these factors in truck-involved crashes with respect to non-truck crashes was evaluated using a Bayesian statistical approach.

Likelihood ratios were calculated separately for crash-related factors, vehicle-related factors, and driver-related factors. Among the vehicle-related factors; being an emergency or utility vehicle, having a defective brake system, and other vehicular defects seem to have contributed to higher fatalities in truck crashes. Crash-related factors such as having a recent crash nearby, being struck by falling cargo, being in a construction/maintenance zone, inadequate warning signs etc. have greater probability of occurrence in fatal truck crashes than in non-truck crashes. Driver-related factors such as following improperly, starting or backing improperly, overloading or improper loading of the vehicle, making improper entry or exits, erratic lane changes, cellular phone usage, failure to yield right of way, inattentiveness, and failure to obey traffic rules also have a greater probability in fatal truck crashes. Inadequate warning signs and poor shoulder conditions were also found to have greater predominance in contributing to truck crashes than non-truck crashes.

Several other factors have been observed for a better understanding of characteristics and contributory factors for fatal truck crashes. By addressing these factors through the implementation of appropriate remedial measures, the overall truck crash rate can be reduced, which can help in improving overall safety of the transportation system.

Sri Lanka also seem to have a considerable number of fatalities involving larger vehicles such as trucks, buses, and other heavy vehicles and a similar methodology could be used in studying the factors contributing to such cases.