Effectiveness of Airbags for Reducing Injury to Belted Drivers

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ABSTRACT

The combination of airbags and seat belts has been shown to be effective at reducing fatalities in crashes. Less is known however about the effectiveness of these restraints to reduce serious injury. The objective of this study is to determine the risk of injury associated with the inclusion of airbags into vehicles for belted drivers in frontal crashes. NASS/CDS case years 1993-2007 were used in this analysis. An odds ratio analysis from a logistic regression model was conducted to determine which body regions benefitted from the inclusion of airbags. This study considered both moderate (AIS2+) and severe (AIS3+) injuries. The finding was that the inclusion of airbags did not significantly reduce the odds of head or chest injury. The presence of airbags significantly increased the odds of lower extremity, upper extremity and spine injury of belted drivers. The face was shown to be more protected with airbags. The depowering of airbags did not significantly change the odds of injury to any body region.

This research approach presents a number of distinct advantages over similar analyses. This research does not combine the results of the passenger and driver, which experience very different loading environments. Also, the face is analyzed independently of the head. This approach shows the benefit seen for the face and the lack of a significant benefit for the head. Our analysis also ensures that the comparison populations are similar in their occupant and crash characteristics. The confounding factors in the logistic regression model all exhibit statistically significant effects on the predicted odd ratio and increase the predictive power of the model.

From this we are able to determine that the presence of an airbag has not significantly reduced the odds of moderate or serious injury for any body region except the face for belted drivers in frontal crashes.