

2022 Mid-Continent Transportation Research Symposium

Ames, Iowa

September 14–15, 2022

intrans.iastate.edu/events/midcon2022/

Effect of Seat Belt Use on Injury Severity for Adult Rear-Seat Occupants Injured in Motor Vehicle Crashes

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Abstract

In the State of Iowa passengers age 18 and older are not required by law to use seat belts when they ride in the back seat of a motor vehicle. Only 23.1% of adult rear-seat passengers involved in fatal crashes in Iowa from 2013-2019 were belted compared to 70.5% of adult front-seat passengers.

This project aimed to estimate and compare the costs of traumatic injuries suffered by adult rear-seat occupants based on reported seat belt use. After access to the trauma data was impacted by the COVID-19 pandemic, another data source was identified that consisted of Iowa hospital data that had been probabilistically linked to injured individuals in Iowa crash reports. However, examination of the resulting data set strongly suggested that the data linkage was of low quality. Therefore, the reported results focus on dependent measures from the crash data.

From 2016-2019, a total of 1,646 adult occupants seated in rear positions in passenger vehicles who were reported to be injured were identified from the Iowa crash data system. Ordinal regression models were used to calculate odds ratios for seat belt use while controlling for several covariates, including age, gender, vehicle damage, speed limit, crash type, and time of day. Injured adult occupants in the rear seat who were not belted were 6.2 times more likely to have a fatal injury compared to lower levels of injury and 3.6 times more likely to have a fatal or serious injury compared to a minor or possible injury. Occupants were 1.9 times more likely to receive a higher level of transport to medical care compared to those who were belted. Two thirds of injured adult occupants in the rear seat were younger than age 40. A total of 1,892 years of potential life (relative to an expected age of 80) were lost due to fatal injuries. After controlling for gender and crash characteristics, the unbelted occupants ($n = 34$) lost significantly more years of potential life, on average, than the belted occupants ($n = 8$).