

Obesity may increase the chances of survival in road crashes

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(PhysOrg.com) -- Overweight men have a better chance of surviving a crash, but only if they're wearing a safety belt, according to the University of Michigan Transportation Research Institute.

In a new study in the current issue of the journal *Traffic Injury Prevention*, UMTRI researchers Michael Sivak, Brandon Schoettle and Jonathan Rupp found that belted male drivers who are obese (those with a [Body Mass Index](#) between 35 and 50) have a 22 percent lower probability of being killed if involved in a fatal crash than belted male drivers who are underweight (those with a BMI between 15 and 18.4).

However, the opposite is true for unbelted males, they say. The probability of being killed is 10 percent higher for unbelted male drivers with a BMI between 35 and 50, compared to those with a BMI between 15 and 18.4.

The UMTRI researchers analyzed data from the National Highway Traffic Safety Administration for nearly 300,000 drivers involved in fatal crashes in the United States from 1998 to 2008—about 51 percent of whom were killed. They found that, overall, drivers who fail to wear safety belts are 2.1 times as likely to die in a fatal crash as those who are belted.

Further, their results indicate that female drivers are 1.1 times as likely to die as male drivers. However, for women who wear safety belts, a normal BMI leads to the lowest risk of death, while both higher and

lower BMIs increase the risk.

Belted female drivers with a BMI between 35 and 50 have a 10 percent higher probability of being killed in a crash than those with a normal BMI between 18.5 and 24.9. Likewise, the probability of being killed is 8 percent higher for those with a BMI between 15 and 18.4, compared to those with a BMI between 18.5 and 24.9.

The researchers found no statistically significant differences among the BMI categories for unbelted women drivers.

"Our findings suggest that for increasing BMI, the optimal balance between the positive effects of extra cushioning and negative effects of extra mass and momentum depends on the gender of the driver and the use of safety belts," said Sivak, research professor and head of UMTRI's Human Factors Division.

"At a similar BMI, men are generally heavier than women because of height differences. Therefore, a man is more likely to overload the airbag, resulting in the increase in risk with increasing BMI for unbelted men. The decrease in risk with increasing BMI for belted men is likely because the safety belt tends to prevent this overloading."

Overall, Sivak and colleagues say their findings suggest that the designs of airbags, safety belts, knee restraints, seats and other components of occupant-restraint systems may need to be improved to better protect [drivers](#) and their passengers at both extremes of BMI.

"Doing this will likely require new tools that can be used to evaluate the ability of restraint systems to mitigate injury potential, such as new crash-test dummies and finite-element models, because current dummies and models represent normal BMI occupants," Sivak said.

Provided by University of Michigan

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