

# **Real-world performance of vehicle crash test: the case of EuroNCAP**

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## **Abstract-**

**Objective:** To investigate whether the occupants in vehicles with better safety ratings according to EuroNCAP sustain fewer fatal and severe injuries than occupants in vehicles with worse experimental safety ratings when in frontal crashes.

**Design:** Case-control study.

**Setting:** A representative sample of crashes in Britain from 1996 to 2008 as gathered in the Cooperative Crash Injury Study (CCIS) database under the auspices of the UK Department of Transportation and augmented with EuroNCAP experimental ratings for each crashed vehicle.

**Subjects:** Drivers and front seat passengers while occupants of vehicles for which EuroNCAP test results were available and who met inclusion criteria meant to select those in crashes similar to those in the frontal experimental setting.

**Main outcome measures:** Fatality and severe MAIS3+ injuries to the head, thorax, pelvis and lower extremities.

**Results:** The multivariate Poisson regression models on the 1259 cases who sustained crash conditions most similar to the experimental ones showed no statistically significant effect on either mortality or MAIS3+ injury in real-world crashes when travelling in cars with better safety ratings. For example, when compared to a driver in a vehicle rated as safest for head injuries MAIS3+ in frontal crashes, drivers in vehicles rated yellow or orange presented adjusted ORs of 0.6 (0.2 to 1.7) and 0.8 (0.3 to 2.1), respectively.

**Conclusions:** No statistically significant relationships between the EuroNCAP safety scores and real-world death or severe injury outcomes were found, suggesting the need to review biomechanical criteria chosen to set cut-off points for the rating system.

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