

Major factors affecting the severity of motor vehicle accidents in Sri Lanka

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Abstract

Increasing road accidents is a heavy burden to a developing country like Sri Lanka. The objective of this study is to identify the significant factors affecting the motor vehicle accidents in Sri Lanka. Secondary data used in this study between the period 2014 to 2016 were acquired from the traffic police headquarters in Sri Lanka. A total number of 78531 motor vehicle accidents were included in the analysis. Factors considered in the study were vehicle type, gender of driver, validity of license, accident cause, alcohol test, time of accident, weekday/weekend, road surface, weather condition, light condition, location and age of driver. Two third of data (52354) was used to develop the model, and the remaining 1/3 of data (26177) was used to validate the model. Severity of accidents was categorized as grievous and non-grievous accidents. Chi-square test of independence has detected that road surface and weather are not significantly associated with the severity of accidents. The light condition variable is removed due to multicollinearity. Binary logistic regression is applied to model the severity of road accidents. The area under the receiver operating characteristic (ROC) curve was 0.692 which means the fitted model classifies the group significantly better than by chance. Fitted model is correctly predicted 79.9 % of the validation data which is greater than to the predictive power of the baseline model 69.8%. Results revealed that time, location, alcohol test and accident cause increase the effect on the probability of a grievous accident and vehicle type, age of driver and gender decrease the effect on the probability of a grievous accident. Bend or junction, aggressive/negligent driving, drive in daytime, driving light vehicle have a high chance to be a grievous accident. These findings can aid modifying laws and establishing preventive approaches in Sri Lanka.

Keywords: Grievous accidents; Logistic Regression; Motor cycle accidents; Non-grievous accidents; Severity of accidents