

**Poster presentation: 223**

## **Major factors affecting the severity of motorcycle accidents in Sri Lanka**

N. A. M. R. Senaviratna<sup>1\*</sup> and T. M. J. A. Cooray<sup>2</sup>

<sup>1</sup>Department of Mathematics, Faculty of Natural Sciences, The Open University of Sri Lanka,  
Sri Lanka

<sup>2</sup>Department of Mathematics, Faculty of Engineering, University of Moratuwa, Sri Lanka  
\*naseen@ou.ac.lk

Ever increasing road accidents and traffic flow is a heavy burden to a developing country like Sri Lanka. Among road accidents, motorcycle accidents involved a high rate of accidents. In the year 2016, 10754 motorcycle accidents were reported, where 11% of them are fatal contributing to 1178 deaths. Therefore, it is essential to find solutions and reduce motorcycle accident deaths and injuries. The objective of this study is to identify the significant factors affecting motorcycle accidents in Sri Lanka. Secondary data used in this study from 2014 to 2016 were acquired from the Traffic Police headquarters, Colombo in Sri Lanka. Data were recorded as grievous and non-grievous accidents. Percentage of grievous accidents is increased from 28 to 38 from 2014 to 2016. Non-grievous accident percentage is increased from 30 to 36 from 2014 to 2016. Factors considered in the study were the gender of a motorcyclist, the validity of the license, accident cause, alcohol test, time of the accident, weekday/weekend, road surface, weather condition, light condition, location and the age of motorcyclist. Binary logistic regression is applied to evaluate the odds of grievous accidents compared to non-grievous accidents. Location type, time, age of motorcyclist, accident cause and gender have a significant effect on the severity of motorcycle accidents. Odds of a grievous accident occurred through aggressive/negligent driving is 53%, more likely to be a grievous accident occurred by speeding. Odds of a grievous accident occurred in the night time is 73%, less likely to be a grievous accident occurred in the daytime. Odds of a grievous accident occurred in bend or junction is 77%, less likely to be a grievous accident occurred in the road. Odds of a grievous accident occurred by the male motorcyclist is 48%, more likely to be a grievous accident occurred by the female motorcyclist. For every one-unit increase in age of motorcyclist, the odds of occurring a grievous accident decreases. This imply the older the motorcyclist, the less the accident risk. Majority of motorcycle accidents (28.5%) reported by the motorcyclists is in between 19-24 years old. The developed model is correctly classified the outcome for 74.3% of the cases compared to 56.6% in the null model. Hosmer & Lemeshow test suggests the fitted model is a good fit to the data. The area under the receiver operating characteristic (ROC) curve (0.587) indicates the that model classifies the group significantly better than by chance. The fitted model correctly predicted 79.6% of the validation data which is greater than to the predictive power of the null model 56.6%.

**Keywords:** Accident severity, grievous accidents, logistic regression, motorcycle accidents, non-grievous accidents