

STUDY OF MOTORCYCLE SAFETY HELMET USAGE RATES AND INJURY SEVERITY

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Department of Civil Engineering

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Thesis submitted in partial fulfillment of the requirements for the degree Master of



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Declaration

I declare that this is my own work and this thesis does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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Dedication



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Abstract

Involvement of motor bicycle accidents as a motor bicycle occupant is one of the most common causes of serious head injuries. Use of motorcycle safety helmets has been found to be effective in reducing injuries in accidents. The protective effect of motorcycle safety helmets has been well documented in motor bicycle safety literature. Beginning from 2011, wearing safety helmets for all types of motor bicycles are mandatory in Sri Lanka. Previously these regulations were not valid for motor bicycle with low engine capacity, such as moped motor bicycles. Even though wearing bicycle safety helmets are now required for all motorcycle occupants in Sri Lanka, many child motorcycle passengers do not wear them. The objectives of this study are to investigate the effectiveness of helmet laws in Sri Lanka and the relationship between motor bicycle accidents and motorcycle helmet use.

A detailed literature review on motor bicycle safety including the effectiveness of legislation and injury-prevention strategies is carried out in order to understand the current state of research on this area. Those studies indicated that children who wear helmets experienced fewer head injuries and decreased injury severity. However, there are various reasons to limited use of motorcycle helmets while some people simply do not use or reluctant to use helmets. The rate of motorcycle helmet use appeared to be varying from one geographic location to other. Community-wide helmet-promotion campaigns combined with legislation are most successful in increasing helmet use and decreasing injury. A large number of studies were based on comparisons of safety helmet use versus not use among the accidents involving motor bicycle occupants. Also, some of studies investigated characteristics and injury severity of accidents involving motor bicycle occupants.

The objectives of this study are to investigate motorcycle helmet use rates and the motorcycle accidents.

A representative sample of motorcycles was observed using the mobile observation method that covered all roads throughout Sri Lanka during 2011 and 2012. Roads in Sri Lanka classified as A, B, C, and D-class roads and collected data were representative samples of all these classes. In mobile observation method, while traveling inside vehicle head-on motorcycles were observed and recorded which included number of occupants in the motorcycle and the helmet usage of all the occupants. The accident severity data were obtained from the Police headquarters, Baduraliya Police Station, and Homagama Police Station while injury severity data were obtained from the, Baduraliya Hospital and Homagama Hospital.

According to observational data, the average motorcycle helmet use rate was 81%. Motorcycle operators and pillions in town areas travelling on A-class roads were more likely to wear safety helmets. While the safety helmet usage was low among riders and pillions traveling in rural areas on C & D-class roadways. The helmet usage rate among children was as low as 20%, while adult helmet usage rate was 86%.

Approximately 36.4% of fatal accidents out of all fatal accidents were reported for motorcycles during 2011 and 2012. Also, motorcycles represented 40.5% of grievous injury accidents, 38.4% of non-grievous accidents, and 9.7% of Damage Only accidents. The comparisons between helmet use rates and injury severity in both rural and urban setting were carried out using selected A, B, and C-class roadways. As compared to low safety helmet use in rural areas, the numbers of fatal and grievous injuries in these areas were higher.



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