

Crash and injury characteristics of riders in motorcycle-passenger vehicle crashes

ABSTRACT

The motorcycle has become one of the most common type of vehicles used on the road, particularly in the Asia region, including Malaysia, due to its size-convenience and affordable price. This study focuses only on crashes involving motorcycles with passenger cars consisting 43 real world crashes obtained from in-depth crash investigation process from June 2016 till July 2017. The study collected and analyzed vehicle and site parameters obtained during crash investigation and injury information acquired from the patient-treating hospital. The investigation team, consisting of two personnel, is stationed at the Emergency Department of the treatment facility, and was dispatched to the crash scene once receiving notification of the related crashes. The injury information retrieved was coded according to the level of severity using the Abbreviated Injury Scale (AIS) and classified into different body regions. The data revealed that weekend crashes were significantly higher for the night time period and the crash occurrence was the highest during morning hours (commuting to work period) for weekdays. Bad weather conditions play a minimal effect towards the occurrence of motorcycle – passenger vehicle crashes and nearly 90% involved motorcycles with single riders. Riders up to 25 years old are heavily involved in crashes with passenger vehicles (60%), followed by 26-55 year age group with 35%. Male riders were dominant in each of the age segments. The majority of the crashes involved side impacts, followed by rear impacts and cars outnumbered the rest of the passenger vehicle types in terms of crash involvement with motorcycles. The investigation data also revealed that passenger vehicles were the most at-fault counterpart (62%) when involved in crashes with motorcycles and most of the crashes involved situations whereby both of the vehicles are travelling in the same direction and one of the vehicles is in a turning maneuver. More than 80% of the involved motorcycle riders had sustained yellow severity level during triage process. The study also found that nearly 30% of the riders sustained injuries to the lower extremities, while MAIS level 3 injuries were recorded for all body regions except for thorax region. The result showed that crashes in which the motorcycles were found to be at fault were more likely to occur during night and raining conditions. These types of crashes were also found to be more likely to involve other types of passenger vehicles rather than cars and possess higher likelihood in resulting higher ISS (≥ 6) value to the involved rider. To reduce motorcycle fatalities, it first has to understand the characteristics concerned and focus may be given on crashes involving passenger vehicles as the most dominant crash partner on Malaysian roads.

Keyword: Motorcycle crash; Passenger vehicle; In-depth crash investigation; Injury mechanism