



## Exploration of motorcyclists' red-light running and helmet use at signalized intersections in Ghana

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**Background:** Motorcyclists in addition to pedestrians and cyclists make up more than half of all road traffic crashes (RTCs), with Africa, South-East Asia and the Western Pacific recording the highest proportion of road traffic deaths (RTDs) (World Health Organization 2019). These road users have less protection and are at more risk than car occupants in RTCs. In the US, more than 70% of motorcycle crashes result in some form of injuries between 1999 and 2008 (Jones et al. 2013). Before 2009, motorcyclists accounted for 15–16% of RTDs in the EU-24 countries and the US (Yannis et al. 2011). The contribution of motorcycle crashes to RTDs in low- and middle-income countries (LMICs) range from 50.0 to 70.0%.

The incidence of motorcycle crashes is mostly caused by motorcyclists in both LMICs (including Ghana, and Nigeria) and high-income countries (HICs) (such as the US) (Jones et al. 2013). Factors that significantly influence the occurrence of motorcycle crashes are human factors, vehicle conditions and environmental factors. Of the three, the largest proportion of motorcycle crashes are human-related -impatience, careless, selfish and dangerous driving, red-light running, speeding and drink-riding (Ding et al. 2019).

Notable among motorcyclists' behavior are red-light running (RLR), riding in the lane, speeding, and drink-driving predisposing the occurrence of RTCs (Dapilah et al. 2017). RLR causes hundreds of deaths and tens of thousands of injuries yearly. For instance, in 2017, 890 people were killed, and an estimated 132,000 people were injured in RLR related crashes in the United States. However, the lack of such data in LMICs makes it difficult to appreciate the contribution of RLR to road crashes.

**Aim:** There is a dearth of empirical studies on motorcyclists' red-light running and helmet use at signalized intersections in low and middle-income countries like Ghana, Nigeria and Malaysia. This study seeks to fill the gap by looking at red-light running and helmet use at signalized intersections in the Cape Coast metropolis, Ghana. The study also identified potential areas of intervention to reduce the dangers posed by motorcyclists' red-light running in the Cape Coast Metropolis without the use of a helmet.



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**Method:** A naturalistic exploratory un-obstructive observational approach was used in assessing this phenomenon. The relationship between motorcyclists' behaviors and motorcyclists' observed demographic characteristics, the locality of the intersection, time of the week and presence of pillion passengers were analyzed. Chi-Square test of independence was used to establish the statistically significant relationships between dependent and independent variables.

**Results:** In all, 2,225 motorcyclists and 744 pillion passengers were observed. The results revealed that 33.1% of the motorcyclists ran a red light with 45.4% not using a helmet. Red-light running at signalized intersections was significantly linked to the locality of the intersection, time of the week, and helmet use. The helmet use was low and significantly associated with the presence of a pillion passenger and whether the pillion passenger used a helmet or not.

**Conclusion:** Red-light running is influenced by locality of intersection, time of the week and helmet use. Efforts to reduce red-light running and improve helmet use should involve road safety education, awareness creation, and enforcement of traffic laws by the officials of the National Road Safety Authority and Motor Transport and Traffic Department of the Ghana Police Service. City managers in other low and middle-income countries can use the findings in the study to inform policy.