



Using crash data as a means of identifying and defining particularly vulnerable subgroups of pedestrians in Ghana

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Abstract

Background – In low- and middle-income countries pedestrians and cyclists account for approximately 26% of the road traffic death, which is a considerable amount as it is well known that the majority (90%) of the worlds road traffic deaths are occurring in these same countries. In Africa however, pedestrian and cyclist deaths account for 44% of their yearly road related deaths. Ghana is no exception to this trend; in fact, it has been estimated that pedestrian crashes alone account for 42% of road related deaths in the country. Recent literature supports the urgent need to identify vulnerable road users to appropriately recommend and develop measures aimed at providing them accommodations. Additionally, an increasing number of studies have indicated the vulnerability of pedestrian road users under various conditions in developing countries particularly in Ghana. And although a great deal of these studies have investigated and provide insight into the occurrence of pedestrian crashes and their associated severities in Ghana, to the knowledge of the authors there have been no studies conducted in attempt to specifically define the pedestrian groups at the highest risk in Ghana.

Aim – The objective of this study is specifically to perform a latent class analysis to identify particularly vulnerable groups and the injury profiles of pedestrians involved in crashes that occurred between 2018 and 2020 in Ghana. Through the investigation of variables such as the pedestrians age, action, location on the roadway, environmental factors capturing various features of the built environment, and variables describing certain aspects of the crash this study attempts to identify the most vulnerable groups of pedestrians in Ghana.

Methodology – The methodology utilized in this study is latent class analysis, which is used to identify subgroups of pedestrians in pedestrian-involved crashes in Ghana based on the variables found to be shared within the classes. Then, injury severity analyses are performed to assess how different crash factors influence various injury severity outcomes so that their associated impact magnitudes can be investigated.



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Anticipated Results – Expectedly the results of this study will identify various sub-groupings of pedestrians and understand their relative fatality risks. Based on preliminary descriptive statistics of pedestrian crashes and literature review some pedestrian groups that may be potentially identified are street hawkers at intersections, commuting school children, the elderly, and travelers on the roadside. Results from the injury severity analysis should provide insight into the influencing factors in each of the particular subgroups of pedestrians.

Conclusions – Based on the identified classes and the variables found within them the subgroup of pedestrians each class describes can be defined. By defining these particularly vulnerable subgroups of pedestrians recommendations from this study might be able to stoke the collaboration between government, private sector and community, including the identified pedestrian groups. Preliminary data analysis shows that the development of targeted policies and shared roads and facilities should be done in consultation with the vulnerable road users, to ensure that the infrastructure is appropriate and relevant to their needs. This is expected to foster a more accepting attitude on roadways and improve facilities and policies according to specific pedestrian groups, thus, increasing overall safety for pedestrians in Ghana.