



## Temporal analysis of bus crashes in Ghana

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### Introduction

Road Traffic Crashes are a leading cause of personal injuries, fatalities, loss of property, and trauma in globally, in Ghana the situation especially is alarming. Bus passengers are among the most vulnerable road user groups along with motorcyclist, and pedestrians. Although intercity bus passenger crashes may not have higher incidence, the extent of injury and fatalities associated with its occurrence make it very traumatic and also affects several families with rippling socioeconomic effects not to mention the stress on medical facilities.

Currently, various kinds of research are being carried out across the globe to deal with this road canker. However, difference in cultural context means the findings from most of these studies may not be applicable in Ghana. As a result, addressing road safety concerns in Ghana requires the appreciation of the problem in the Ghanaian context.

There is limited research on the temporal variation of bus crashes that resulted in fatalities globally and particularly in Ghana. Meanwhile, fatality is not the only effect of road accidents. Consequently, the broad temporal variation of bus crashes in Ghana, in general, is still far from clear. Ultimately, this research seeks to address a gap in the temporal variations of bus crashes in Ghana.

### Objective

To establish the temporal variations of crashes involving at least a bus.



## **Methodology**

The study analysed temporal variations of crashes involving at least a bus in Ghana using crash data from 2016 to 2020 retrieved from the National Crash Database at the Council for Scientific and Industrial Research (CSIR) - Building and Road Research Institute (BRRRI). Primary data were obtained through informal interviews with some bus drivers. Secondary crash data retrieved from BRRRI was analysed cross tabulation and descriptive statistics from the Microsoft Excel program. The SPSS version 26 was also used for the statistical analyses.

## **Results**

The analyses revealed that 2422 buses were involved in various crashes with different severities spread over about 15000km of trunk roads nationwide. The month of December was the peak followed by November, and the lowest in April, and February. Kruskal Wallis test indicated that the monthly crashes exhibited time series seasonality, indicating that the pattern is likely to repeat in the subsequent years which is actually the observations. Friday, Saturday, and Monday were found to be the days of the week with the most crashes . A chi-square test indicated that days of the week had a statistically significant effect on the daily bus crash frequency. Accidents were also found to be predominant at the beginning and end of working and schooling hours. The situation is likely to be similar in other West African states.

## **Conclusions**

The study found out that:

- Bus operators have implemented measures such as routine bus maintenance and driver training to help improve road safety.
- The monthly crashes exhibited time series seasonality, indicating that the pattern is likely to repeat in the subsequent years.
- The days of the week had a statistically significant effect on the daily bus crash frequency.

## **Recommendation**

The study contributes essential information on the temporal trend of bus crashes in Ghana, which has practical meanings for the effective management of bus operations. Knowledge of this temporal trend of crashes may help the Motor Transport and Traffic Department (MTTD) of the Ghana Police Service (GPS) in intensifying their road safety measures, and deploying officers to enforcement of traffic rules and traffic control at these temporal hotspots.