Road Transportation in Yobe State: The Accident Dimension on Damaturu-Potiskum Road

BY

Mohammed Ya'u; Nura Hassan; Babagana Makinta

katamma300@gmail.com, **08032897056**

Department of Civil Engineering Technology, the Federal Polytechnic Damaturu

Abstract

Due to the growth of the number of people killed and seriously injured on roads worldwide, road accident has been acknowledged as a global phenomenon, which becomes an issue that requires proper attention from authorities of virtually all countries across the globe. An evaluation into the contributions of human, road, and vehicular factors on accidents along Damaturu- Potiskum road of Yobe state have been conducted, aimed at segregating accidents recorded from 2017 to 2019 into severity index, vehicular types involve and fatality rate. The methodology used is a mixture of primary data, secondary data, and field surveys. The outcome of the investigation revealed that,64% of the total accidents recorded was contributed by human factor, while vehicular and road factors contributed to 36 and 3% respectively. Likewise, 49% of the vehicles involved are private cars, 34% commercial cars and 17% are other vehicular types. However, 28% of the accidents recorded are fatal, 30 and 42% of the accidents are serious and minor cases respectively with no fatality. Thirty-four (34%) of the total persons involved in the accidents died. The outcome further revealed that the accident rate varies every quarter, likewise the severity index. The results of the Chi-Square test of significance obtained, backed the earlier findings that there was a significant difference among the various causes of the accidents, the accident cases (fatal, serious or minor) and types of vehicles involved. The study further revealed that 67% of the drivers have no valid driver's license and 70% of the vehicle inspected have at least 3 defects. It was therefore recommended that an attempt should be made to report an accident by location to identify accident-prone areas to effectively provide remedial measures.

***Keywords**:* Accident, Fatality, severity index

1.0 Introduction

In Nigeria, road is the main mode of transport in operation, used for freight and passenger traffic, as the rail system has failed and only a few can afford to use airways. Nigeria has the largest road network in West Africa, in 2014 (National Planning Commission, 2015). Nigeria has about 200,000km road, out of which about 34,000km (17.6%) are Federal roads, 32,000km (15.7%) state roads and 134,000km (66.7%) local and rural roads (National Planning Commission, 2015). These roads are poorly maintained and neglected for long by the authorities which contribute to the nation's high accident rates (World Health Organization, 2016).

Road traffic accidents (RTA) is a phenomenon occurring on highways and roads involving motor vehicle by chance or by unknown causes that produce injuries and property damage (Aworemi, Abdul-Azeez, & Olabode, 2010). According to Ohakwe, Iwuze & Chikeze (2011), Road traffic accidents (RTA) is an event that happened between two objects one of which is a moving vehicle on a road section.

Road traffic accidents (RTA) is caused by either human factor, vehicular factor, or road factor. This is due to either vehicle colliding with other vehicles, road facilities, other road users, animals, and geographical features or by vehicular system failure. The cause could also be due to poor road conditions, over speed, poor human perception reaction, or adverse weather conditions (World Health Organization, 2014). Evans (2016) asserts that 95% of road accidents are caused by the human factor. Elini & Maria (2010) asserted that, skilled drivers with registered licenses involve in accidents are mostly due to risk-taking.

More than 1.2 million deaths are recorded annually due to motor vehicle collisions with a greater number of injuries worldwide. Developing countries have the highest accident records in which Nigeria is among (World Health Organization, 2016). Several factors that include rapid urbanization and motorization, poor roads network and traffic facilities, and road user's behavior contribute to the developing countries' high accident records (Ohakwe, Iwueze, & Chikeze, 2011). Road traffic accidents (RTA) is ranked among the top leading causes of death worldwide (Noc & Ofoma, 2016).

According to the national bureau of statistics, on average 12 people died daily in road accidents across Nigeria. From January to June of the year 2019, 59,724 people involved in accidents with 4,163 dead and 27,408 injured and a total of 14,425 vehicles were involved within the said period (National Bureau of Statistics, Nigeria, 2019). Road traffic accidents (RTA) casualty of 775, 633, and 1081 were recorded for the year 2016, 2017, and 2018 respectively in Yobe state (Aderinola & Laoye, 2020). The consequence covers physical, emotional, social, and economic implications (Oluwaseyi & Gbadamosi, 2017).

This paper evaluates the contributions of human, road, and vehicular factors on accidents along Damaturu- Potiskum road of Yobe state, aimed at segregating accidents recorded from 2017 to 2019 into severity index, vehicular types involve and fatality rate.

2.0 Methodology

Data were collected on road accidents in Yobe state for three years (2017-2019) from federal road safety corps (FRSC) Damaturu office. The data were sorted into an accident by severity, vehicle types involve, fatality, and injuries, which were further segregated into human, vehicular, and road factors as the causal factors. The data were further presented quarterly for comparative analysis. Chi-square and simple percentages were used in analyzing the

data. A pilot survey was conducted to ascertain the road conditions, signs, and markings. One hundred (100) questionnaires each were administered to the private and public car drivers at some selected motor parks within the metropolis to assess the level of understanding of common road signs, driver's license validity, vehicular conditions to identify major defects and training received on roads traffic regulations.

3.0 Results and Discussions

Figure1 shows the percentage of accidents that occurred due to human, vehicular and environmental factors on Damaturu-Potiskum road. Out of the 5887 accidents recorded, 64, 33, and 3% of the accidents are caused by human, vehicular, and environmental factors respectively. The human factor contributes more to the frequent accident on the study, it nearly doubled that of vehicular and 21 times that of environmental. This corroborates the findings by Evans (2016) that human factors contribute more to a road traffic accident. The outcome of a chi-square test conducted affirmed the earlier assertion that at a 95% confidence level (X^2=19.2 > 5.99) there is a significant difference on the causes of accidents.

Figure 1: causes of accident 2017-2019

Figure2 shows the types of vehicles involved in accidents. It could be deduced from the figure that, 49% of the vehicles involved in the accidents are private cars, while 34 and 17% are other vehicular types and commercial cars respectively. This reputes the findings by Ukoji (2014) that fatal accidents are more prevalent in commercial vehicles. The type of vehicles involved in accidents might depend on the locations and type of dominant vehicles plying the road. The outcome of Chi-square further revealed that there is a significant difference in the vehicle types involved in RTA (X^2=11.8 > 5.99).d be good in fast reading and writing.

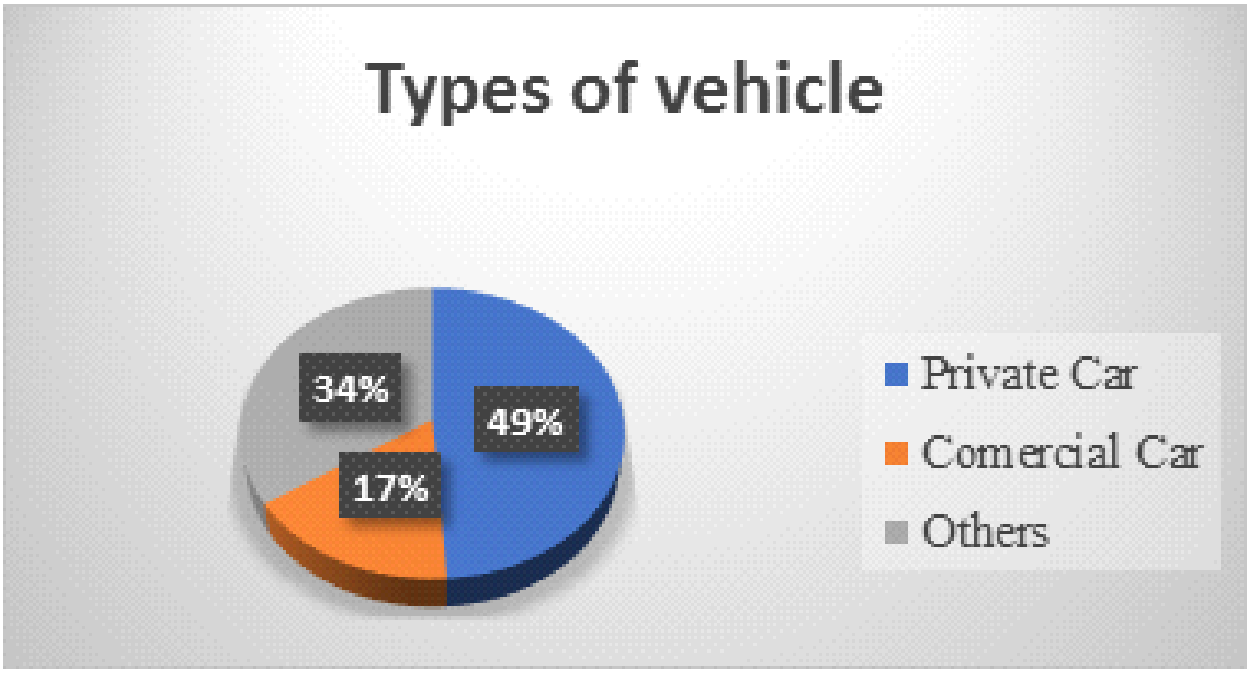

Figure 2: Type of vehicle involved in accident 2017-2019

Figure 3 shows the accidents quarterly severity index, the first quarter of 2017 has the highest severity index of 0.72, the minimum severity index of 0.46 was also recorded in the third quarter of 2017. This further affirms the findings by Ayodeji (2018) that Yobe, Borno, Katsina and Gombe are the states with high severity index in Nigeria. The figure further revealed that the safety mechanism introduced on the road, coupled with an ongoing increase in the carriageway capacity have no significant effect on reducing the accident fatality on the road

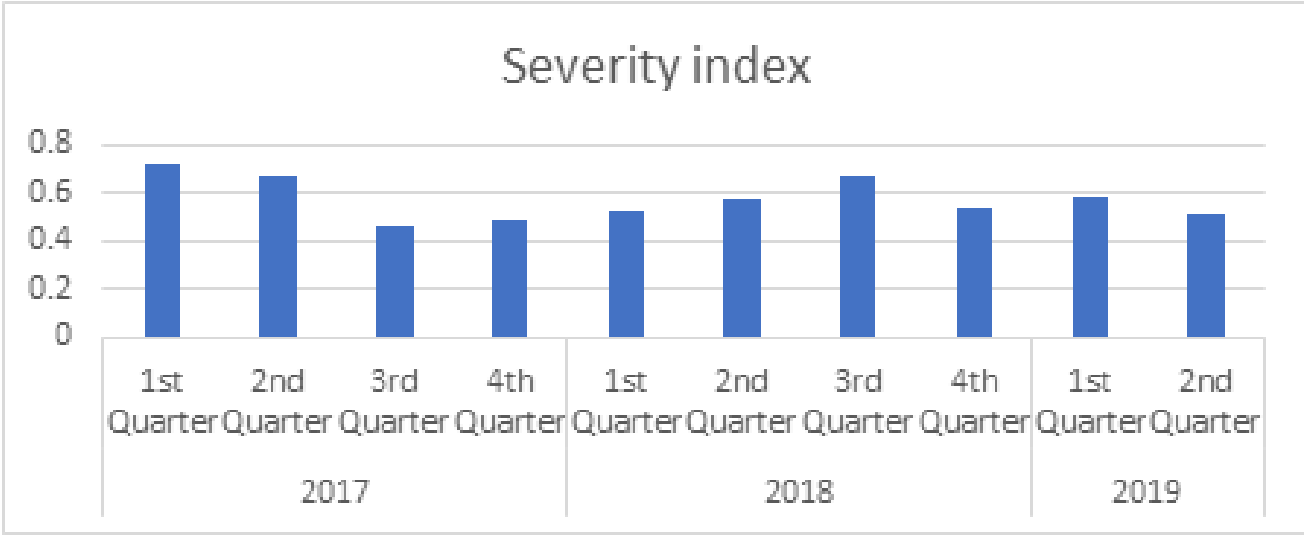

Figure 3: An accident severity index

From Figure 4, Out of the total accident of 5887 reported 28% were fatal, 30% were serious and 42% of the accidents are minor cases.

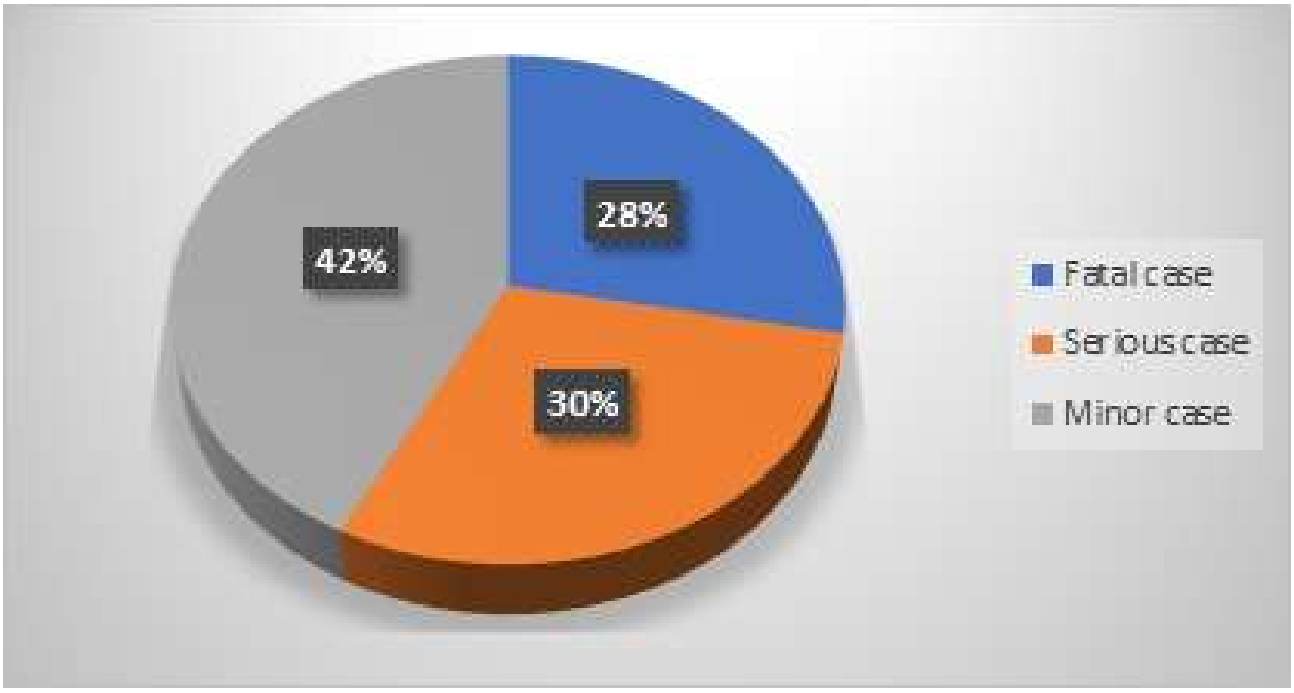

Figure 4: accident severity in 2017-2019

Figure 5 shows the quarterly severity of the accidents recorded for the study period, the highest number of fatal cases of 231 was recorded in the first quarter of 2017and lowest of 71 cases in the second quarter of 2019. Likewise, the highest number of serious cases was recorded in the first quarter of 2017 and the lowest was recorded in the second quarter of 2019. The highest minor cases recorded were in the third quarter of 2017 and the least was in the second quarter of 2019. The fatal, serious, and minor cases do not follow a definite pattern, which suggests that the safety mechanisms used have less significance on the accident severity.

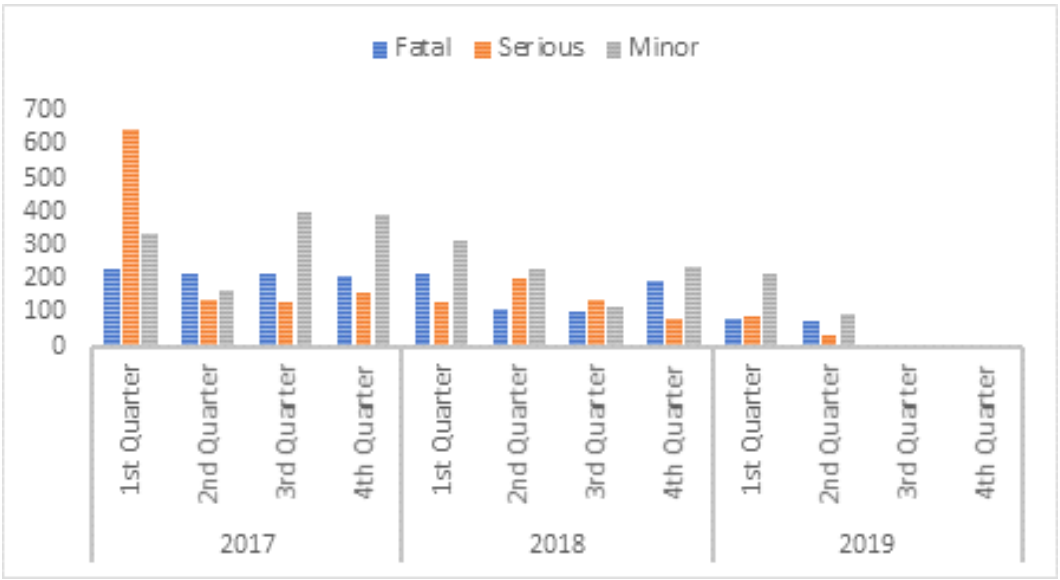

Figure 5: Accident quarterly severity

Figure 6 through 7 shows the percentage of death and injured for the accidents recorded for the study periods. Of the total number of persons involved in accidents within the study periods, 1521 persons died which represents 33.74%, and 2987 persons injured which represent 66.26%. The quarterly annual increased or decreased in death and injury does not follow a definite pattern within the study periods. The highest number of deaths recorded was in the second quarter of 2017 and the lowest in the second quarter of 2019. Likewise, the highest number of people injured was recorded in the second quarter of 2017 and the least in the second quarter of 2019.

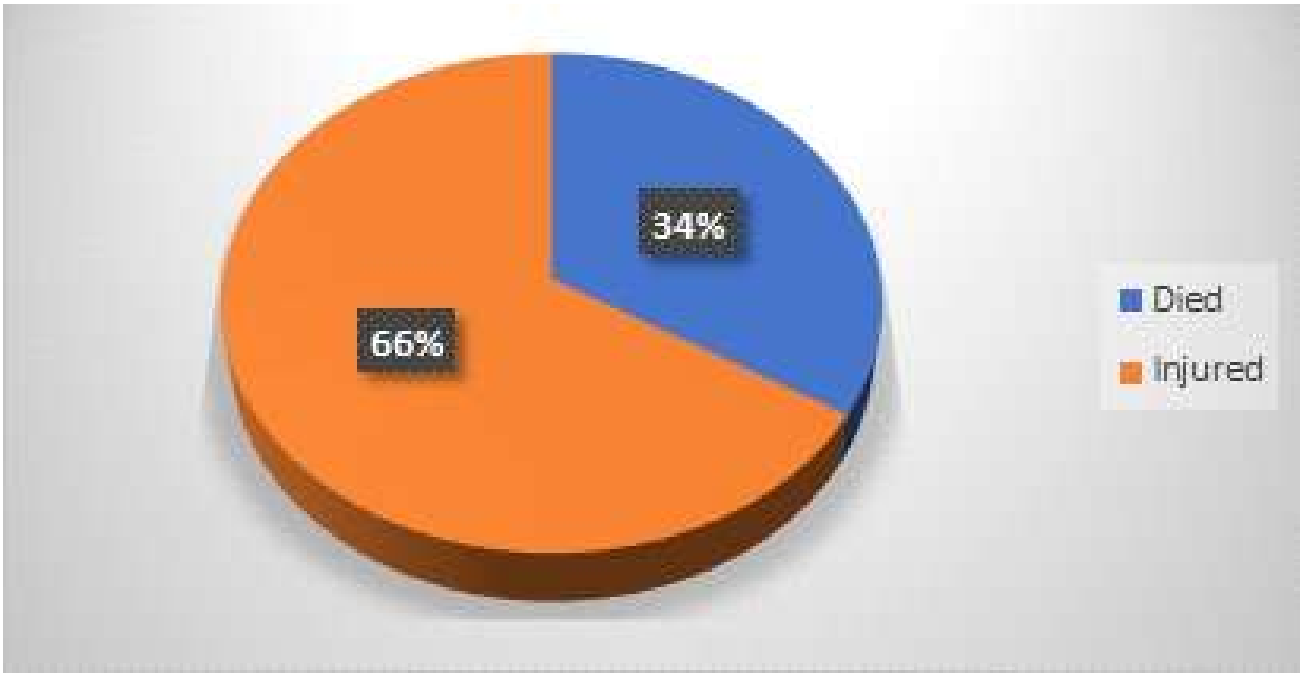

Figure 6: Percentage of people died/injured 2017-2019

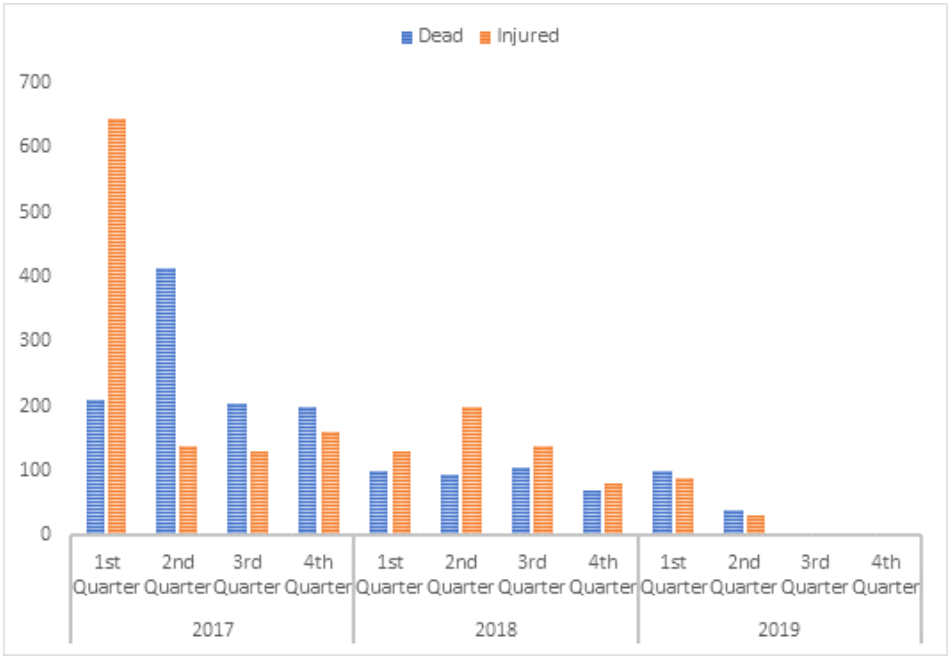

Figure 7: Quarterly dead and injured rate

The outcome of the analysis of 200 administered questionnaires, 100 each for private and commercial vehicle drivers indicated that 60% of the drivers lack basic knowledge and have no formal awareness on road signs and markings. The study further revealed that 67% of the drivers have no valid driver's license and 70% of the vehicle inspected have at least 3 defects.

The outcome of the pilot survey conducted revealed that no adequate road signs and markings were in place. Due to the ongoing expansion of the road section, diversion signs were not adequately and appropriately installed. The survey further revealed that no adequate reflective signs were placed on military and police checkpoints along the road section. This greatly contributed to the frequent accidents in the study section, especially at night.

Conclusions

From the outcome of the study, it could be concluded that:

1. Human factor contributes to 64% of the total accidents recorded within the study periods

2. Forty-nine (49%) of the vehicles involved in accidents within the space of the period are private cars against 34 and 17% of commercial and other vehicular types respectively.

3. Twenty-eight (28%) of the accident recorded are fatal, while 30 and 42% of the accidents are serious and minor cases respectively with no fatality.

4. Thirty-four (34%) of the total persons involved in the accidents died.

5. Sixty-seven (67%) of the drivers have no valid driver's license and 70% of the vehicle inspected have at least 3 defects.

The followings are recommended

1. There is a need to create a database for recording and grouping accidents according to the causes for effective management.

2. An attempt should be made to report the accident by location to help identify accident-prone areas for effective remedial measures.

3. Drivers must pass through driving schools and be subjected to medical check-ups for sight, hearing, and mental alertness.

4. Road signs for both the pedestrians and the drivers to be clearly and properly placed.

5. The government should set-up an enlightenment campaign to educate the road-users on-road usage.

6. Efforts should be made to determine the daily and hourly variation of the accident on our roads in the country.

7. Efforts should be made by law enforcement agents to ensure drivers possess valid licenses and vehicles' particulars.

8. Vehicles should be tested frequently for roadworthiness to reduce accidents due to faulty vehicles.

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