A Spatiotemporal Analysis of the incidence of Road Traffic Accidents Along Lagos/ Abeokuta Expressway

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Abstract: **There is generally an increase incidence of morbidity and mortality rates of road traffic accidents across the world, but majority of the morbidity occur in developing countries, this research is therefore aimed at carrying out a spatiotemporal analysis of incidence of road traffic accident along Lagos/ Abeokuta Expressway, to enable the researcher identify prominent accident spots on the road, identifying accident prevalent time in order to analyse if relationship exist between location, time and prevalent of traffic accident. For the purpose of this research, statistical records were consulted and questionnaire design and randomly distributed to commuters at some notable bus stops. The retrieved questionnaire was analysed and formulated hypotheses were tested using regression statistical tool. Based on the findings, it can be concluded that human, mechanical and environmental characteristics are the salient factors that are responsible for road traffic crashes in the study area, the research therefore recommend a total enforcement of traffic rules and regulation to correct erring drivers and the Government and affected institutions should take the issue of road construction and maintenance more seriously, and in the event of road construction proper diversion and traffic sign should be put in place.**

Keywords: **Road Traffic Accident, Commuters, Spatiotemporal**

I. BACKGROUND TO THE STUDY

Over the years, there have been dramatic changes in human behaviour especially with the wave of globalization, modernization, and information communication technology (ICT) which tries to bridge the gap between people and cultures. However, this has influenced the extent to which people commute from one place to another. The need for vehicular and human movement has created serious safety and risks concerns by the government, the motorist, the public and the general society especially in Nigeria as a result of crash injuries and damages arising from transport behaviour. Nigeria, with a total land area of 910,771 square kilometres and the human population of about 167 million, is the most populous country in Africa, and the 7th most populous nation in the world (Uzuegbu, 2016).

Its large land mass and burgeoning population correlate with its high level of a vehicular population estimated at over 7.6 million with a total road length of about 194,000 kilometres (comprising 34, 120 km federal, 30,500 Km, State and 129,580 km of local roads). Nigeria ranks second among countries with largest road network in Africa in 2011. The population density varies in rural and urban settlement. (Approximately 51.7% and 48.3% respectively) which translate to a population-road ratio of 860 persons per square kilometres which indicate an intense traffic pressure on the available road network. This pressure contributes to the high road traffic accidents in the country (FRSC, 2012).

Road traffic accidents occurrence is attributed to vehicular collision, pedestrian, animal, road debris, or other stationary obstruction, such as a tree or utility pole (Jacob, 2010). Road traffic accident, therefore, is an issue of great global concern as it emerges as the single greatest source of death all over the world. Number of accident relating to motor vehicle is much lower in developing countries than developed countries, while fatalities from automobile crashes are higher. It has been shown, for instance, that road traffic accidents in developing countries cost almost one per cent of the country's annual Gross National Product (GNP) (Akpoghomeh, 1998).

Nigeria continues to feature in the bottom half of the World Health Organization country rankings of road traffic accidents. The country is the 149th ranking in 2009 out of 178 member states indicates the hazards associated with road transportation in a country that is largely dependent on its road network for economic, social and physical activities. Worldwide, road traffic accidents lead to death and disability as well as financial cost to both society and the individual involved. There is a generally an increased incidence of morbidity and mortality rates resulting from road traffic accidents. Road traffic accidents injures commuter every day in developing country like Nigeria (Ovwori et.al 2010).

The Federal Road Safety Commission (FRSC) was established in 1988, with the aim of advocating, educating, identifying road-users' risk induced behaviours and punishment for road traffic offences (FRSC, 2007). The commissioning was as a result of the incessant increase in the trend of road accident on the Nigerian roads and highways. Onuoha and Akinyemi (2012) affirm that several strategies have been used and are still being used by the FRSC public education officers to educate road users in general and drivers in particular on the rules guiding road usage and the consequences of flagrant disobedience of traffic rules and regulations. These strategies as identified by Sani (2005) comprise the organization of workshop/ seminars/ lectures and

drivers' improvement courses, carrying out rallies at motor parks, literacy campaigns by inculcating in the road users the knowledge of the highway traffic code, playing of jingles on radios and televisions among others.

1.2 Statement of the problem

The recurring of auto accidents on Nigeria roads appears to have defied solution in spite of the concerted efforts of the FRSC and other stakeholders at reducing the trend. Researches also reveals the Government and the people are greatly concerned about the incessant increase in road traffic accidents which results in unnecessary consequential waste of lives and properties. A lot of funds are equally wasted yearly in an effort to reduce the trends of road traffic accident on Nigeria roads and highways. For instance, Idoko (2010) submits that Nigeria loses three billion naira every year to road crashes and that road crashes cost Nigeria 13 per cent of her Gross National Product (GNP). This loss invariably inhibits the economic and social development of the nation.

1.3 Aim and Objectives

This research, therefore, aims to carry out a spatiotemporal analysis of the incidence of road traffic accidents on Lagos/ Abeokuta Expressway, to achieve the above aim, below are the objectives:

i.   To identify prominent accident spots in the study area.
ii. To examine accident prevalent time and types.
iii. To analyze the relationship that exists between location, time and prevalent of a traffic accident.
iv. In the light of (1-3) above to recommend preventive measures or steps that can be taken to curtail the menace.

1.4 Research questions

i.   Where are the prominent accident spots in the study area?

ii. What relationship exists between time and type of accident prevalent?

iii. Does relationship exist between location, time and prevalent of a traffic accident?

iv. What are different measures or steps that can be taken to curtail the menace?

1.5 Statement of the research hypotheses

These hypotheses are statements drawn from the specific objectives of the study to test if the statements are true at a particular level of significance.

H 0: No relationship that exists between time and type of accident prevalent.

H 1: Relationship exists between time and type of accident prevalent.

H 0: No relationship exists between location, time and prevalent of traffic accident

H 1: Relationship exist between location, time and prevalent of traffic accident

1.6 Scope of the study

The scope of this study will be limited to Lagos-Abeokuta Expressway, being a busy road prominent for gridlock and traffic accident. The review approach is aimed to provide a comprehensive overview of the spatial and temporal analysis of the incidence of a road traffic accident on the route, identifying prominent areas known for a road traffic accident in order to analyse the causes and prevalent time of the accident on the road.

1.7 Significance of the study

This study will be of immense benefit to many people, organizations and government. It will be of immense benefit to the commuters of Ogun State and Lagos state respectively, as the outcome of the research will contribute to their knowledge on the factors responsible for the regular occurrence of an accident on the Lagos- Abeokuta Expressway, the road is notable for potholes thereby causing constant traffic jams and accidents. The major part of the road over the years has degenerated to a death trap which therefore necessitated researchers and government attention. The recommendations from the research will help to curtail the frequent occurrence of an accident on the road. The research will also contribute positively to the existing literature, constituting a new platform on which to evaluate the hypotheses that travel time, road and location are major issues of road accident on the route. Most importantly, it avoids the biases created by a disaggregate analysis by comparing travel behaviours across entire urbanized areas. The government would as well benefit from the study as it will seek effective ways of curtailing the regular account of the accident on the axis as some of the recommendations in the research.

1.8 The Study Area

Transportation is one of the most important aspects of Lagos that drives its business strength but unfortunately, the state of the roads is pitiable. The Lagos-Abeokuta expressway is a road that links Lagos and Ogun states and serves as a commercial route. The close proximity between the two states enhances trade and interaction between the states. Therefore, the road is always hectic almost round the clock due to the transportation of goods and passengers. Traffic officers are stationed at strategic locations on the road to ensure free flow of vehicular movement, but impatient of the commercial motorcyclist otherwise called Okada riders attempt to beat traffic officers at any given opportunity, which may sometimes be catastrophic, meanwhile conductors too call their destination by the road side in order to cut cost they incur while loading passengers at the park, in that case some touts working for the National Union of Road Transport Workers (NURTW) chase the commercial bus (Danfo) drivers picking passengers on the road, in order to collect their dues, in an attempt to evade the payment dangerous driving often

occur which may sometimes result to road traffic accident. The road is notable for traffic at different points which has been a nightmare to the motorist; the traffic in this axis will soon give way with the Akinwunmi Ambode-led administration's Bus Rapid Transit (BRT), which will commute between Abule-Egba and Oshodi. The passengers estimate on the corridor is about 230,000 per day, which may likely go up to 300,000. The most terrible portions of the road are Dopemu under bridge diversion, Ile-Epo/Oja, Abule-Egba, Kola and Tollgate junction. The traffic situation in these areas is always at a standstill, leaving police and traffic control officials helpless. From Oshodi to Ikeja, the traffic is always in three batches: Oshodi under-bridge to Ladipo, Shogunle to PWD and Airport bus stop to Ikeja, such that the journey of fewer than 10 minutes lasts for an hour, thereby resulting in unnecessary over speeding at any possible traffic escape, which may sometimes result in road traffic accident.

II. LITERATURE REVIEW

A logistic regression model was developed by James and Kim (1991), who describes the use of child safety seat for children involved in auto crashes in Hawaii from 1986 through 1991. The model shows that children riding in an automobile are less likely to be restrained, while drivers who uses seat belt are far more likely to restrain their children, and one-and-two-year olds are less likely to be restrained. The study of Yannis et al. (2005) and Al-Ghamdi (2002) which was conducted in Greece and Saudi Arabia, respectively, takes the combined effects of factors which includes age on different respondents. The former tackles on combined effects of driver and motorcycle dependent factors on two response variables namely accident severity and at-fault risk. It reveals engine size and age a significant combined effect of both variables in respect of accident on accidents.

An assessment was carried out to ascertain the effect of rainfall on the severity of single-vehicle crashes on Wisconsin highway conducted by Soyoung et al (2009), utilizing polychotomous response model. The weather related factors examined in the research includes estimated rainfall intensity for 15 minutes before the occurrence of crashes, water film depth, the wind speed/ direction, temperature, the stopping sight distance and deficiency of car-following distance at the crash moment. For areas with unavailability of weather information, data interpolation was adopted, using the inverse squared distance method.

Non-weather variables such as road geometrics, traffic conditions, collision types, vehicle types, and driver and temporal attributes were also deliberated upon. Two types of polychotomous response models were analysed: ordinal logistic and sequential logistic regressions. The sequential logistic regression was tested with forwarding and backward formats. Comparative models were also established for single-vehicle crash severity during clear weather. In conclusion, the backward sequential logistic regression model produced the best results for predicting crash severities in the rainy season

where rainfall intensity, wind speed, roadway terrain, driver's gender, and safety belt were found to be statistically significant. Their study also found that the seasonal factor was significant in clear weather. The seasonal factor is a predictor suggesting that inclement weather may affect crash severity. These findings can be used to determine the probabilities of single-vehicle crash severity in rainy weather and provide quantitative support on improving road weather safety via weather warning systems, highway facility improvements, and speed limit management.

The causes of road traffic accidents depend on a list of factors which can be broadly divided into:

a) Vehicle operator or driver factors
b) Vehicle factors
c) Road pavement condition factors
d) Environmental factors.

A road traffic accident can be caused by a single factor or a combination of these factors. Most safety studies come to the conclusion that vehicle operator or driver factors (or human error) are the main cause of accidents. Nevertheless, such a conclusion has not proved to be efficient in its capacity to offer adequate means to fight against this error. In a purpose of better qualifying accident causation, TRACE, Traffic Accident Causation in Europe, after conducting substantive research works on Human Functional Failures (HFF) in a road accident which is defined as the failures of the human functions which usually allow the road user to adapt to the difficulties of the driving task. It further described the HFF as the consequence of a gap between the requirements of a task and the capacities of an operator to face it, this gap resulting from the combined influence, and mostly inseparable, of the internal conditions characterizing this operator and external conditions to which he is confronted in the realization of his activity.

2.2. Vehicle operator or Driver factors

Driver factors in road traffic accidents are all factors related to drivers and other road users. However, unlike the findings of TRACE, in Nigeria, studies and road traffic accident records have clearly shown that the attitude of the Nigerian driver to driving code and etiquette is the single most important contributing factor as driver factors solely contributes to about 57 per cent of road traffic accidents and 93 per cent either alone or in combination with other factors.

2.2.1   Driver-related issues include:

I.   Speed and indiscriminate use of Sirens

An increase in average speed is directly related both to the likelihood of a crash occurring and to the severity of the consequences of the crash. Travelling too fast for prevailing conditions or above the speed limit contributes to road traffic accidents. The risk of being injured increases exponentially with speed much faster than the average speed. The severity

of an accident depends on the vehicle speed change at impact and transfer of kinetic energy.

II. Drink–driving and use of drugs

Drinking and driving increase both the risk of a traffic accident and the likelihood that death or serious injury will result. The risk of being involved in a traffic accident increases significantly above a blood alcohol concentration (BAC). Doctors often advise patients to abstain from driving vehicles or operation of machinery while under certain drugs as these drugs are known to cause side effects of sleepiness and fatigue thus leading to the possible occurrence of an accident.

III. Distracted driving

There are many types of distractions that can lead to impaired driving, but recently there has been a marked increase around the world in the use of mobile phones by drivers that is becoming a growing concern for road safety. The distraction caused by mobile phones can impair driving performance in a number of ways, e.g. longer reaction times (notably braking reaction time, but also a reaction to traffic signals), impaired ability to keep in the correct lane, and shorter following distances. Text messaging also results in considerably reduced driving performance, with young drivers at a particular risk of the effects of distraction resulting from this use. Drivers

using a mobile phone are approximately four times more likely to be involved in a traffic accident than when a driver does not use a phone.

IV. Inexperience and unqualified drivers

Majority of Nigerian drivers do not possess the right authorization from government authorized agencies like the Federal Road Safety Commission, FRSC and are unqualified before driving cars on road pavements. This is the major reason most Nigerian drivers are ignorant of highway traffic signs. They put their lives and those of other road users at the risk of traffic accidents.

V. Non-use of safety device and negligence of duty by the government established agencies

Seat belts are safety device provided to safeguard a driver in the course of an accident. The use of vehicle seatbelts also helps to ensure that the driver is in an upright and comfortable position thus enabling him/her to properly operate the vehicle. However, this provided safety device has been grossly abused thus increasing the risk of fatality among front-seat and of rear-seat passengers.

2.3. Vehicle factors

The vehicle itself is a key factor when analysing the remote causes of a traffic accident and it is incorporated with gadgets like the horn, side mirrors, wipers, braking system, trafficators, headlights and break-lights (to mention just a few) so as to avoid road accident. Malfunction of any vehicle parts such as tyres, engines, braking systems, light systems can

cause road traffic accidents. The reliability of the vehicle is itself a function of the condition of the vehicle at every given time. Vehicle components and vehicle maintenance are the two main conditions which affect vehicle factors as it relates to causes of road traffic accidents.

2.3.1. Vehicle Components

The assembled components of a vehicle working effectively uniformly or abnormally as a unit will determine the occurrence of a traffic accident.

I. Vehicle Design

The specific maximum load designed for a vehicle in its entire ramification goes a long way towards determining its stability on the road surface. When vehicles are subjected to stress over and above the provisions of the design specifications as is the case of a lot of vehicles plying the Nigerian roads, deterioration for the condition of the vehicle in accelerated wear and tear sets in. Design defects affect the subsequent condition of the vehicle once it is put on the road and operated either normally or otherwise which may result in possible road traffic accidents.

II. Vehicle Brake System

Brakes are generally applied to rotating axles or wheels. Vehicles use a combination of braking mechanisms which works jointly with the accelerator as the main synchronizer of the speeds of vehicles. Any malfunctioning of the brake sub-system should be taken very seriously as a potential source of an unavoidable accident.

III. Vehicle Body and Tyres

The firmness of the structure of a vehicle though less prominent attributes to some measure in causing road traffic accidents. One of the dominant factors in determining the stability and safety of vehicles on the road is the tyres. Tyres designed and specified for cold regions are not those specified for temperate regions like Nigeria. However, this is not the case of most tyres used in Nigeria as vehicle owners do not take the specification of tyres into consideration when buying and fixing tyres unto their vehicles and this has been known to cause tyre ruptures thus leading to traffic accidents.

IV. Vehicle Lights

The failure of vehicle light is a major factor in a road traffic accident. Failure of vehicle lights has a tendency to misinform and mislead other road users thereby providing a good opportunity for an accident to occur. Vehicle lights are very useful at all times during the daylight, in darkness and in poor/bad weather. For example, a failed trafficator light of a vehicle ahead will not normally provide the usual warning to other vehicles behind that it is about to undertake a turning manoeuvre and if for instance the driver of the vehicle behind has not allowed for a sufficient stopping sight distance or the vehicle has a faulty brake sub-system, this could result in an accident occurring.

V. Vehicle Engine

The powerhouse and heart of the vehicle is the engine sub-system which is responsible for bringing other parts of the vehicle into motion and one whose sudden failure on a highway is more likely to cause an accident if the volume of traffic is sufficiently high at that point in time. Even when the traffic is reasonably low, mismanagement of the failure by an experienced driver could cause a road traffic accident.

VI. Vehicle Maintenance

Acquiring a well-designed vehicle and putting it unto the road use is not enough to prevent the vehicle from causing a road traffic accident. Actually not performing routine maintenance and checks on the vehicle can lead to deterioration of the vehicle sub-systems and thus expose the vehicle to causing road traffic accident as a well-maintained vehicle is less likely to be involved in accidents.

2.4. Road pavement condition factors

The Nigerian highways are arguably one of the worst and most dangerous in the world as they are often poorly designed, necessary important road facilities like drains are not adequately provided for and to top it up, they are rarely rehabilitated and are in dilapidated states. The deplorable states of the Nigerian highways create a scenario that makes vehicles and other road users susceptible to road traffic accidents. This further confirms that road traffic accidents are not just caused by human error or drivers' negligence.

2.5. Environmental factors

Environmental related conditions such as fog, sunrays, mist and rain in no small measure contribute greatly to the rate of road traffic accident in Nigeria today. Having stated earlier that most vehicles on Nigerian roads are poorly maintained, a poorly maintained vehicle for example on a rainy day is most likely to cause road traffic accident if the wipers are faulty and not functioning as the driver will be unable to see ahead.

2.6 Accident Incidence On Lagos Road

Ikeja, the capital of Lagos State, recorded the highest number of deaths from car accidents. Most lives were lost in the Ikeja axis of the Lagos–Ibadan Expressway. The strategic location of the area places it at the centre of fatal car accidents, with a record of 266 car accident deaths. The significance of road traffic accident along the study area also cannot be overemphasized as the road is popularly known for its commercial activities, as it is the road that links the popular computer village and Oshodi respectively, meanwhile the road is very narrow compared to the volume of vehicles fleeting the road, particularly the construction activities currently going on, which is the construction of BRT corridor which makes the road ever busy and blocked, overzealousness of the commercial bus drivers on the axis with the sole aim of dropping off their passenger to quickly to embark on another trip is also one of the major causes of accident on the road.

Oshodi is one of the most populated areas of Lagos State, with major industries located in the LGA. The expressway is a major link to Tin can Island, where most companies involved in oil distribution are located. The presence of these companies has kept Apapa, Mainland, Island and Eti-Osa ever busy with commercial activities. Oil pipelines cut through many residential areas in Lagos State. Distribution of Premium Motor Spirit (PMS), a major cause of deaths along Apapa/Mile 2/ Oshodi Expressway, has always been on-going. The volatility of such refined products makes it fatal each time tankers have accidents. In May 2008, for instance, an explosion occurred after a bulldozer hit an oil pipe and about 100 people were killed by fire, including many school children. Aside from oil companies, other protagonists, such as government security agencies, have caused fatal road accidents in the state. In a bid to evade arrest, commercial bus drivers cause fatal accidents. Policemen mount roadblocks that have caused several fatal road accidents. Approximately 54 people died in multiple road accidents caused by a police checkpoint on Shangisha Bridge, between the Toll Gate and Berger Bus Stop near Otedola Housing Estate in October 2010. However, the administration of Governor Fashola (2007–2015) has achieved reasonable success in the reduction of road accidents in Lagos State. Lagos State Traffic Management Authority (LASTMA) was created to reduce deaths, injuries, and economic losses from road accidents by employing modern traffic management techniques. The agency is empowered, among other things, to relocate tankers to industrial parks, impound tankers and cars parked indiscriminately, and ensure strict compliance with safety measures. Accidents have been reduced from 19% in 2008 to 9% in 2009. It was further reduced to about 8% in 2013 and continues to show signs of a reduction over the years.

Figure 2.2: No. of Deaths by Local Govt. in Lagos (2010-2016)
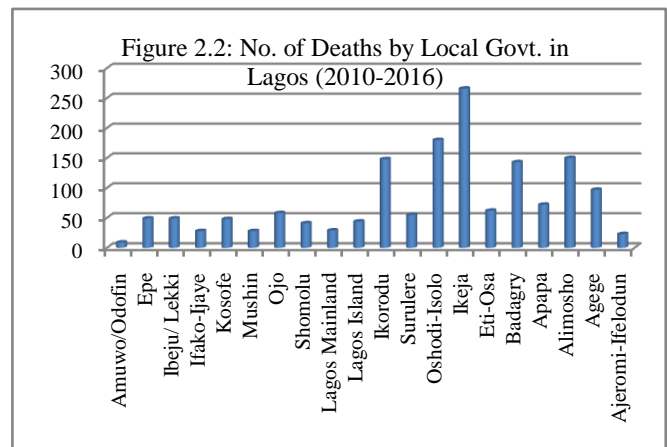
Source: Federal Road Safety Corp

2.7 State of Lagos-Abeokuta Expressway

The Lagos-Abeokuta Expressway is deteriorating every day, things are getting terribly bad why the Government tends not to hear the anecdote of the commuters. Some sections of the road are terribly bad why some are fair, starting from Toll Gate all the way to Ifo the road is in a terrible state. Toll Gate,

Sango, Joju, Connoils/Singer, Owode, Ilogbo, and other areas have become a death trap. The part of the expressway from Toll Gate, going into Lagos, are still a little beat motorable when compared to the axis going into Ogun State. The axis going into Lagos sometimes receives attention through some patches due to the volume of commuters going into Lagos during the peak period (Morning), which often get them stranded, which often compel palliative measures to be done. The government of Ogun state is heavily in debt, and most of the road projects they started are still uncompleted, which makes it difficult to maintain the road, which has to be the major cause of traffic deadlocks on the roads. The potholes on the highway are constantly widening, and the drainage system terribly bad which often result to flooding on the road when rain falls thereby causing a traffic jam, while motorist that is not used to the road often falls into the death trap at night which sometimes result to accident. This problem has lingered for many years and nothing has been done. FERMA (Federal Road Maintenance Agency) that are saddled with the responsibility of maintaining the road is nowhere to be found. Motorists are often compelled to take a bike. The ordeal continues while the situation is not addressed, the government doesn't recognize the fact that those areas are heavily populated, which makes it a nightmare for the motorist as they all have to queue along the good portion of the road, If you go over those bad roads, prepare for aches all over your body and take some balm or painkillers when you get home. The Federal Government neglect of the road is not painting the country in good light as lives are usually wasted due to the terrible nature of the road.

III. RESEARCH METHODOLOGY

3.1 Sources of Data

In order to cater to the need of the research, the primary source of data (self-constructed structured questionnaire) was the major source of data used for the research, the questionnaire was constructed by the researcher aimed at providing answers to some of the research questions, the participants were asked to furnish information with regards to their gender, educational level, age, marital status, monthly income, size of household and the purpose of respondents trip and some road traffic accident data was obtained from the Federal Road Safety Corp (FRSC website) while some were obtained from FRSC office at toll gate bus- Stop along the study area, this was obtained to ascertain the specific area with the highest prevalence of road traffic accident, with the aim of examining the causes of the accidents, examine the prevalent time of the accident on the road and also to analyse if relationship exists between certain location, time and prevalent of traffic accident in the study area, It also focused on different suggestion and recommendation on preventive measures or steps that can be taken to curtail the menace.

3.2 Sampling Techniques

Statistical sampling technique is an important research tool for a number of disciplines because it enables the researcher to learn more about a population without studying every single individual in the population. For the purpose of this type of research that involve selected few people transiting along the axis, the simple random approach was adopted, where the respondents were selected at various motor parks, therefore the sample population constitute 200 respondents.

3.3 Research Instrumentation and administration

Research instruments are tools used in obtaining, gathering, measuring or assessing information. The critical research instrument which was used for this study is a questionnaire, which was distributed to the sample population, aimed at generating information from them based on the research objective.

The questionnaires were designed into 5 sections, A, B, C, D and E. Section "A" of the questionnaire focused on the demographic information of the respondents, such as the Gender of respondents, Age, marital status, qualifications, occupation, marital status, monthly income and size of household. Meanwhile, section B focused on the travel behaviour of the respondents, and section C focus on transportation structure, section D focus on Accident related spots and section E focus on causes of a road traffic accident in order recommend possible solutions so as to curtail the menace.

3.4 Data Analysis Techniques

The data collected was sorted out in order to identify the ones that were not correctly filled, that might cause incompetence on the part of the researcher. The data analysis was based on the questionnaire computed for the research work, as the research questions were analyzed using statistical software, called Statistical Package for Social Sciences (SPSS). Both descriptive and inferential statistical analysis was utilized in the study. The generated frequencies of the answered questions from the respondents will be presented in simple percentages in a tabular form for easy interpretation. Afterwards, the earlier stated hypotheses were tested using Regression analysis. In statistics, regression is used in estimating the relationships among variables which are identified as an independent and dependent variable. It was found suitable for this kind of research work; where respondents' opinion is sought and evaluated. This sort to investigate the spatial temporal analysis of the incidence of road traffic accidents on the Lagos- Abeokuta Expressway between 2010 to 2017. The basic idea behind survey methodology is to measure variables by asking people questions and then examine relationship among the variables, in order to draw conclusion from the generated responses of the respondents, thereby using the generated data to test the earlier stated hypothesis in order to validate it and decide if the null hypothesis is to be accepted or forgone in order to go for the alternative hypothesis.

IV. DATA PRESENTATION AND RESULT DISCUSSION

4.1   Data presentation

This chapter is aimed at carrying out a comprehensive analysis of generated data, using Statistical Package for Social Sciences (SPSS) computing software through coding, computation and analysis, and information generated later presented in tabular form for easy interpretation. For the purpose of this research, a research questionnaire was the major tool of generating information's from the respondents; since the sample population is relatively small, systematic random sampling technique was adopted for fair representation. A total of two hundred (200) questionnaires were administered, retrieved and scrutinized for the research.

The analysis is divided into three categories, the first category contains the demographic characteristics of the participant, while the second category contains research questions aimed at identifying the travel behaviour of the respondents, while the third is prominent accident locations, prevalent time, causes & prevention.

4.1.1   Demographic Characteristics of Respondents

Variable	Frequency	Percentage
Age of Respondents		
Below 18 years	8	4.0
18-25 Years	38	19.0
26-35 Years	42	21.0
36-45 Years	40	20.0
46-55 Years	38	19.0
above 55 years	34	17.0
Total	200	100.0
Sex of respondents		
Male	83	41.5
Female	117	58.5
Total	200	100.0
Marital Status of Respondents		
Single	75	37.5
Married	82	41.0
Divorced	38	19.0
Widow/Widower	5	2.5
Total	200	100.0
Occupation of Respondents		
Business	58	29.0
Trading	69	34.5
Civil servant	60	30.0
Transporter	13	6.5
Total	200	100.0

Education level of Respondents		
Primary 6	10	5.0
WASC	72	36.0
OND HND/ BSC	72	36.0
Post Graduate/M.Sc.	46	23.0
Total	200	100.0
Income level monthly		
Less than N50,000	57	28.5
N 51,000 – 100,000	66	33.0
N 101,000-150,000	41	20.5
N 151,000 – 200,000	20	10.0
N 201,000 – 250,000	7	3.5
N 251,000 – 300,000	5	2.5
Over 300,000	4	2.0
Total	200	100.0
Size of household		
1-5 people's	48	24.0
6-10 people's	121	60.5
11-15 people's	31	15.5
Total	200	100.0
Do you have your personal vehicles		
50	25.0	25.0
150	75.0	75.0

Source: Fieldwork, 2018

The research reveals the age range of the respondents that makes up the sample population, 4% are below the age of 18 years, 19% are between 18-25 years, 21% are between 26-35 years, 20% are between 36-45 years, 19% are between 46-55 years while 17% are above 55 years respectively. The research, however, reveals the majority of the respondents are between 26-35 years respectively. The research reveals the sex of the respondents, 41.5% are male while 58.5% are female respectively, and the research thus reveals the majority of the respondents are female.

The marital status of the respondents was also sampled, 37.5% are single, 41% are married, 19% are divorced while 2.5% is widow/widower, and it thus reveals more of married respondents. The research reveals the occupations of the respondents as 29% of them are into business, 34.5% are into trading, 30% are civil servant while 6.5% are into transportation business respectively. The education level of the respondents are presented as follows, 5% primary 6, 36% has obtained West African School Certificate, 36% has obtained OND HND/ BSC while 23% has obtained postgraduate/M.Sc certificate respectively. The income level of respondents are represented as follows 28.5% earn less than 50,000, 33% earn between 51,000- 100,000, 20.5% earn between 101,000-150,000, 10% earn between 151,000-

200,000 3.5% earn between 201,000- 250,000, 2.5% earn between 251,000- 300,000 while 2.5% earn above 300,000 respectively, the research however reveals majority of the respondents earn between 51,000- 100,000 respectively. The research reveals 24% of the respondent's household size is between 1-5 peoples, 60.5% are between 6-10 people, while 15.5% are between 11-15 people respectively, the research thus reveals majority of the households are between 6-10 people. The research also reveals the percentage of those with personal vehicle among the respondents, 25% of them have a personal vehicle while 75% does not have a personal vehicle, and the research thus reveals the larger percentage of the respondents does not have a personal car.

SECTION B

4.1.2 Travel Behaviour Of Respondents

Variable	Frequency	Percentage
Category of road user		
Commercial	63	31.5
Pedestrian	65	32.5
Private Driver	46	23.0
Govt. Driver	10	5.0
Commercial motorcycle rider	10	5.0
Private motorcycle rider	6	3.0
Total	200	100.0
How Frequent do you use the road		
Once a week	12	6.0
Twice a week	18	9.0
More than twice a week	44	22.0
Everyday	126	63.0
Total	200	100.0
What is your mode of travelling		
Motorcycle	29	14.5
Public transport	100	50.0
Cab	16	8.0
Personal car	55	27.5
Total	200	100.0
What is the state of the road		
Good	13	6.5
Fair	56	28.0
Poor	131	65.5
Total	200	100.0
Has government effort at reducing accident worked		
Yes	66	33.0
No	134	67.0
Total	200	100.0

Source: Fieldwork, 2018

The research also reveals the category of road user, 31.5% are commercial bus driver, 32.5% are pedestrian, 23% are private car driver, 5% are Govt. driver, 5% are commercial motorcycle rider, while 3% are private motorcycle rider respectively, it thus reveals a larger percentage of the participants are pedestrian. The research also reveals how frequently does the road user use the road, 6% said once a week, 9% said twice a week, 22% said more than twice a week, while 63% said every day, the research, however, reveals the larger percentage of an everyday user of the road. The research also reveals the respondent's mode of travelling, 14.5% are on a motorcycle, 50% uses public transport, 8% uses a cab, while 27.5% uses a personal car, the research reveals the larger percentage of respondents who uses public transport. The research also reveals the current state of the road, 6.5% commended it is in a good state, 28% said it is fair while 65.5% said it is in poor condition, the research, however, reveals the road is in a dilapidated state. The research reveals if government effort at reducing accident worked, 33% said yes, while 67% said no, it thus reveals government effort at reducing road traffic accident on the study area has not effectively worked.

SECTION C

4.1.3 Accident Location, Time, Causes & Prevention

Variable	Frequency	Percentage
Road traffic Accident location		
Yes	122	61.0
No	78	39.0
Total	200	100.0
At what time of the day does the accident occur		
Morning	140	70.0
Afternoon	12	6.0
Evening	48	24.0
Total	200	100.0
What is the severity of the accident?		
Minor	140	70.0
Fatal	60	30.0
Total	200	100.0
What is the cause of road traffic accident?		
Weather conditions	3	1.5
Road conditions	66	33.0
Light conditions	4	2.0
Wrong driving	55	27.5
Tiredness	4	2.0
Frustration	14	7.0
Lack of proper training	20	10.0
Drunkenness	34	17.0
Total	200	100.0

Seatbelts reduce the risk of injury		
Strongly Agree	77	38.5
Agree	100	50.0
Undecided	15	7.5
Disagree	5	2.5
Strongly Disagree	3	1.5
Total	200	100.0
I feel vulnerable when not wearing a seatbelt		
Strongly Agree	92	46.0
Agree	74	37.0
Undecided	13	6.5
Disagree	9	4.5
Strongly Disagree	12	6.0
Total	200	100.0
I sometimes don't bother to wear a seatbelt		
Strongly Agree	95	47.5
Agree	74	37.0
Undecided	15	7.5
Disagree	12	6.0
Strongly Disagree	4	2.0
Total	200	100.0
Adherence to traffic safety regulation to reduce Road Traffic Accident		
Strongly Agree	119	59.5
Agree	55	27.5
Undecided	20	10.0
Disagree	3	1.5
Strongly Disagree	3	1.5
Total	200	100.0

Source: Fieldwork, 2018

The research is aimed at revealing if the respondents have witnessed accident in the study area, 61% said yes 39% said no respectively, the researchers recorded more of yes respondents, the research also reveals at what location does the accident occur, 40% said at Tollgate which the respondents attributed to the sloppy terrain of the area, which the respondents said break failed heavy-duty vehicle often ramp down the slope thereby crushing people and vehicle, which sometimes with high casualty, 12% said Pleasure bus stop, which the respondents attribute to the population density of the area, accident often occurs due to the impatience on the part of the motorist, 13.5% said Mangoro attributed to the terrain of the location, there is a bus stop in the area, coupled with sloppy terrain, which often time result to accident. Ikeja Along is another identified location notable for a road traffic accident, which is also attributed to the busy nature of the area and impatience on the part of the commercial bus drivers. 14.5% claimed they experience road traffic accident at

Alakuko bus stop, which they attribute to a population density of the area. However, some of the respondents attributed some of the accident to the bad nature of the road coupled with construction activities without proper diversion road traffic signs.

The research also reveals the prevalent period of accident, 70% said in the morning, 6% in the afternoon while 24% in the evening, the research reveals majority of the accident occur in the morning during the peak period, the research also reveals the severity of the accident, 70% said minor while 30% said fatal, the research reveals majority of the accident are usually minor accident, the research also reveals the causes of the accident, 1.5% are attributed to weather condition, 33% to the bad state of the road, 2% attributed to light condition, 27.5% attributed to wrong driving, 2% to tiredness, 7% attributed frustration, 10% attributed to lack of proper training while 17% attributed to drunkenness, the research thus reveals the majority of the accident is attributed to condition of the road and wrong driving habit.

The research is aimed at revealing respondent's opinion on if the use of a seatbelt reduces the risk of injury if a road traffic accident occurs, 38.5% strongly agree, 50% agree, 7.5% undecided, 2.5% disagree, while 1.5% strongly disagree respectively. The research thus reveals the use of seatbelt will go a long way to reduce injury in the occurrence of an accident. The research also reveals if the respondents feel vulnerable when not wearing a seatbelt, 46% strongly agree, 37% agree, 6.5% undecided, 4.5% disagree while 6% strongly disagree respectively. The research reveals respondents feel vulnerable when not using the seatbelt. The research is aimed at revealing the necessity of driving with seatbelt even when the driver drives carefully, 54% strongly agree, 38% agree, 4% undecided, 2.5% disagree while 1.5% strongly disagree, the research reveals seatbelt is necessary even when driving carefully for a precautionary measure. The research also reveals if adherence to traffic safety regulation will reduce road traffic accident, 59.5% strongly agree, 27.5% agree, 10% undecided, 1.5% disagree while 1.5% strongly disagree respectively. The research also reveals if periodic road maintenance will go a long way to reduce road traffic accident, 53% strongly agree, 24% agree, 10% undecided, 6.5% disagree while 6.5% also strongly disagree respectively, it thus reveals periodic road maintenance will reduce prevalent of a road traffic accident.

4.1.4 Test of Hypothesis

For the purpose of testing the Hypothesis, the independent variable will be regressed against the dependent variable. Regression tool is used to estimate the coefficients of the linear equation, involving one or more independent variables that best predict the value of the dependent variable.

Hypothesis one

H 0: There is no relationship that exists between time and type of accident prevalent.

H 1: There is a relationship between time and type of accident prevalent.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.225ª	.051	.046	.83577

a. Predictors: (Constant), What is the severity of the accident?

ANOVAª

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.375	1	7.375	10.559	.001ᵇ
	Residual	138.305	198	.699		
	Total	145.680	199			

a. Dependent Variable: At what time of the day does the accident occur

b. Predictors: (Constant), What is the severity of the accident?

Coefficientsª

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.995	.178		5.599	.000
	What is the severity of the accident?	.419	.129	.225	3.249	.001

a. Dependent Variable: At what time of the day does the accident occur

The table above provides the R and R^2 values of the tested research hypothesis. The research reveals R-value of 0.225, which means there is a strong positive relationship between time and type of accident prevalent in the study area, and R-Square value of 0.51, it explains the total variation of the dependent variable (time) that can be explained by the independent variable (type) while the remaining 49% are attributed to other factors that are not explained by the independent variable. The research also reveals p-value of 0.000 (Significant), which is less than 0.05, and indicates that, overall, the regression model statistically significantly predicts the outcome variable (i.e., it is a good fit for the data). Therefore, the null hypothesis should be rejected while the alternative upholds because it lacks statistical support. It can, however, be concluded that there is a relationship between time and type of accident prevalent.

Hypothesis Two

H 0: There is no relationship exists between location, time and prevalent of traffic accident

H 1: There is a relationship between location, time and prevalent of traffic accident

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.572ª	.327	.323	1.25482

a. Predictors: (Constant), At what time of the day does the accident occur

ANOVAª

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	151.252	1	151.252	96.059	.000ᵇ
	Residual	311.768	198	1.575		
	Total	463.020	199			

a. Dependent Variable: If yes at what location (please indicate)

b. Predictors: (Constant), At what time of the day does the accident occur

Coefficientsª

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.001	.183		5.468	.000
	At what time of the day does the accident occur	1.019	.104	.572	9.801	.000

a. Dependent Variable: If yes at what location (please indicate)

The table above provides the R and R^2 values of the tested research hypothesis. The research reveals R-value of 0.572, which means there is a strong positive relationship between location and time and prevalent of accident in the study area, and R-Square value of 0.32, it explains the total variation of the dependent variable (location) that can be explained by the independent variable (time) while the remaining 68% are other factors that are not explained by the independent variable. The research also reveals p-value of 0.000 (Significant), which is less than 0.05, and indicates that, overall, the regression model statistically significantly predicts the outcome variable (i.e., it is a good fit for the data). Therefore, the null hypothesis should be rejected while the alternative upholds because it lacks statistical support. It can, however, be concluded that there is a relationship between location, time and prevalent of a traffic accident.

V. SUMMARY, RECOMMENDATIONS AND CONCLUSION

5.1 Summary Of Findings

The research made some considerable findings which worth consideration, the road is in a dilapidated state, meanwhile, it is under construction, the contribution of the state of the road coupled with construction activities cannot be overemphasized, as proper diversion is not carried out on the construction corridor, which sometimes results in road traffic accidents. The areas with prevalent of a road traffic accident on the study area are attributed to sloppy terrain such as toll gate and Mangoro, which respondents emphasize accident often occur in the area due to some break failure of a heavy-duty vehicle, which makes them ram into the vehicle along their part resulting in a serious accident. Some areas such as pleasure, Alakuko and Ikeja Along are busy locations that required traffic signs, as some of the road traffic accident that occurs in the location is attributed to the impatience on the part of the drivers, in a busy locations of such and a notable place for commercial activities, there should be road traffic signs for coordination and serenity in the area. The research reveals the majority of the accident occur in the morning time, known as peak period when the motorist is in a rush, the research thus reveals impatience on the part of the respondents also constitute to a road traffic accident in the study area. The following are thus identified as the major causes of the accident in the area, road conditions, wrong driving on the part of the motorist due to lack of proper training and drunkenness respectively.

5.2 Recommendation

Based on the findings the following recommendations were made:

1. The road is dilapidated state; poor visibility or lighting causes a motorist to run into the potholes resulting sometimes to a severe accident.
2. The government should step up the effort at reducing road traffic accident, through awareness campaign and organization of periodic training for the motorist.
3. Road traffic signs (RTS) should be provided in the sloppy terrain in the study area and also in areas with a high concentration of vehicles and commercial activities.
4. Motorist should be forced to abate over speeding during the rush hour, as they don't know the state of mind of other motorists.
5. After the completion of the construction work on the road, the light should be provided to enhance visibility at the wee hour of the day.
6. Motorist should be checked; only properly trained motorist should be allowed on the highway of such magnitude.
7. Drunken motorist should be properly checked and curtailed on our road (Don't drink drive) should be a constant campaign.
8. The use of seatbelt should be encouraged as it will reduce the risk of injury in the occurrence of a road traffic accident.
9. Motorist should ensure they adhere to traffic safety regulation in order to reduce road traffic accident

5.3 Conclusion

An accident is a common phenomenon. It does not segregate on the basis of time and place of occurrence. Road traffic accident in Nigeria is a very serious issue requiring holistic attention and approach towards curbing its occurrence considering the magnitude of the problem it presents to every Nigerian road users. Based on the findings of this study, it was concluded that human, mechanical and environmental characteristics are the salient factors that are responsible for road traffic crashes in Nigeria. There should be total enforcement of traffic rules and regulation to correct erring drivers and the Government and affected institutions should take the issue of road construction and maintenance more seriously, and in the event of road construction, proper diversion and traffic sign should be put in place. Driving schools should be made compulsory so that driving license holders will have full knowledge of traffic rules.

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