CAUSES AND CASUALTY BURDEN OF ROAD TRAFFIC ACCIDENT ALONG LAFIA-NASARAWA EGGON-AKWANGA ROAD BETWEEN 2010-2015

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Abstract

On May 2011, the United Nations General Assembly(UNGA) adopted the years 2011 to 2020 as the decade for road safety, and urged member countries to examine the impact of road accidents and develop strategies to reduce them. However, understanding the impact of road accident, especially in developing countries, is hindered by availability of data as well as its quality. It is just a year to the end of the decade, how do we fair in Nigeria? This study assessed the causes and casualty burden of road traffic accident in Nigeria with a micro focus on Lafia-Nasarawa Eggon-Akwanga Road, in Nasarawa state, Nigeria. The design relied on analysis of secondary data collected from the Federal Road Safety Corp (FRSC) and the Police Motor Traffic Division (MTD) between 2010 and 2015. The findings revealed that human causative factors that ranged from over speeding, route violation, dangerous driving, and wrongful overtaking, were major causes of road traffic accidents along the road. Victims were mostly males; the difference in casualty burden was elevated by the magnitude of injury. The mortality rate revealed a yearly increase. Based on these findings, recommendations include proper road maintenance, massive enlightenment of drivers and road users by the FRSC, enforcement of road safety laws and speed limits, and ensuring the road worthiness of vehicles, among others.

Key words: Injury, Lafia-Nassarawa-Eggon-Akwanga, Road accident, Road Safety Corps, Road casualty.

Abstrait

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En mai 2011, l'Assemblée générale des Nations Unies (AGNU) a défini les années 2011 à 2020 comme la décennie de la sécurité routière et a exhorté les pays membres à examiner l'impact des accidents de la route et à élaborer des stratégies pour les réduire. Cependant, la disponibilité des données ainsi que leur qualité compliquent la compréhension de l'impact des accidents de la route, en particulier dans les pays en développement. C'est juste un an à la fin de la décennie, comment pouvons-nous équitable au Nigeria? Cette étude a évalué les causes et le fardeau des accidents de la route au Nigéria, en mettant l'accent sur la route Lafia-Nasarawa Eggon-Akwanga, dans l'État de Nasarawa, au Nigéria. La conception reposait sur l'analyse de données secondaires collectées auprès de la Federal Road Safety Corp (FRSC) et de la Division de la circulation automobile de la police (MTD) entre 2010 et 2015. Les conclusions ont révélé que les facteurs causaux humains allaient de l'excès de vitesse à la violation de l'itinéraire en passant par la conduite dangereuse. et les dépassements illicites sont des causes majeures d'accidents de la route sur les routes. Les victimes étaient principalement des hommes; la différence entre le nombre de victimes et l'augmentation du nombre de blessés était élevée. Le taux de mortalité a révélé une augmentation annuelle. Sur la base de ces conclusions, les recommandations incluent notamment l'entretien correct des routes, l'éclairage massif des conducteurs et des usagers de la route par la FRSC, l'application des lois sur la sécurité routière et des limitations de vitesse, ainsi que l'assurance du bon état des véhicules, notamment.

Mots clés: Blessure, Lafia-Nassarawa-Eggon-Akwanga, Accident de la route, Corps de la sécurité routière, Victime de la route.

Introduction

Road is defined as a path established over land for the passage of vehicles, people and animals. It provides dependable pathway for moving people and goods from one place to another (Balogun 2010). A typical road is supposed to be smooth and paved for the purpose of allowing easy travel. The types of road as designated by Walkawa, Zador, and Wilks (2010) include single carriageway, dual/multiple carriageway, and expressway. Single carriageway is a road with one or more lanes with traffic flowing in opposite direction without a central reservation. Dual/multiple carriage is a road which has multiple lanes with traffic going in opposite direction. They may or may not be divided with any barrier, such as concrete barrier. Expressway is a specially designed and restricted highway divided with barriers which completely separated each other.

Globally, road crashes (accident) account for a large share of the total number of injuries and deaths (Annon, 2008, Ruschena, (2012). These statistics may be frightening, but they have a more profound significance in developing countries in terms of fatalities per 100 million vehicle kilometer. In Nigeria alone, annual fatalities on road reached 6,450 with burden of injury amounting to 40,057 in 2013. Between 2010-2014, report from the Federal Road Safety Corp (FRSC) indicated that 1,903 children were killed and 8,667 injured in road traffic crashes. The severity of road crash measured in terms of number of persons killed in every 100 crash ranged from 45 persons in 2003 to 75 persons in 2010. While this situation represents the gloomy picture of road transport usage; over 80 percent of all crashes on Nigerian roads were attributed to human cause (Balogun 2010). The most important cause of road crashes identified by the Federal Road Safety Corps and the Nigerian Police relate to drivers error, their state of arousal and level of experience. The other human factor arise from the error of other road users such as pedestrians, passengers and wondering animals (Agreet, 2007).

Road transport is by far the commonest means of transportation in Nigeria. The Lafia-Nasarawa Eggon- Akwanga road remains very important in linking most of the north with the east and southern part of the country. It is therefore of economic strategic importance, not only in moving people but also goods and services. The road passes through communities and settlement laying along both the Southern and Central Senatorial district of Nasarawa state. It also provides the major road link between Benue state (the food basket of the country) and Abuja, the Federal Capital Territory (FCT), the Plateau state and other states in the northern central of the country. Several food items in big trucks and lorries as well as solid mineral mined in the state passed through the Lafia-Nasarawa Eggon-Akwanga road.

The Lafia-Nasarawa Eggon-Akwanga road is about 60 kilometers long. It passes through a terrain of low and mountainous area, that is rocky in nature. Efforts to widen and or dualized the road over the years have failed due to lack of political will. The road is therefore, a single carriageway road, except for some portion dualized within Lafia, the state capital, and within Akwanga town. Traffics therefore flows in opposite direction without a central reservation. Since the road is heavily motorized, the poor road condition and its terrain make traffic accident (RTA) very common. The infamous "many have gone" corner is located 30km from Akwanga and 20km away from Lafia, near Nasarawa Eggon. Due to the hilly, rocky, and bending corners that characterized the 30km route, it has become a common spots of major road accident along the Lafia-Nasarawa Eggon-Akwanga road. The recognition of RTA as a menace on the Lafia-Nasarawa Eggon-Akwanga road resulted to the opening of RS4.31 Akwanga Unit Command of the Federal Road Safety Corps in the year 1990 and RS4.3 Nasarawa State Sector Command in the year 1996. These Commands were established for developing measures aimed at reducing the rate of RTA and consequent injuries and fatalities on the road.

The consequences of RTA are not only on damage vehicles, it also involves injuries, trauma, death, and maiming of passengers. In many instance goods are destroyed. There may also be road obstruction for several hours and days, resulting on delays in movement and man hour lost due to traffic hold up. Along the Lafia-Nasarawa Eggon-Akwanga road, several RTA have been recorded over the years. Although the Road Safety Corps and the National Bureau of Statistics (NBS) have made effort to compile RTA data on the road, on effort has been made to analyze the data to provide the causes, and the burden of victimization (in terms of injury and death) recorded on the road traffic accident along the road. This study seeks to provide analysis of RTA with specific focus on causes and burden along Lafia-Nasarawa Eggon-Akwanga road between 2010-2015.

Methods

Information on RTC along the Lafia-Nasarawa Eggon-Akwanga road was obtained from the Federal Road Safety Corps (FRSC), and the Police Motor Traffic Unit (MTU) in Lafia, covering the period of 2010 and 2015. In order to check for consistency, we adopted internal probabilistic method using the data provided by the National Bureau of Statistics (NBS) yearly report on road traffic accident. The strength of the internal probability, relying on the NBS data, was on comparison, where data from the FRSC and the MTU disagreed especially with respect to causes and number of casualties. The number of road accident victims was computed with respect to route, causes, casualty figures, and gender. We also examined the pattern and trend of RTA between 2010 and 2015 with respect to types of accident (minor, serious, and fatal), and casualty (injuries and death).

Conceptual Explanation, Literature, and Theory

Accident and Road Traffic Accident (RTA)

Accident is defined as anything which happens by chanced, anything occurring unexpectedly (Obugbemi, 2010). Road traffic accident (RTA) is therefore an unexpected phenomenon that occurs as a result of the use or operation of vehicle including bicycles and handcart on the public highway. Accident may be fatal, resulting in death of the road users (passengers, driver, or pedestrian); accident could also be minor, when it is not severe enough as to cause substantial damage. The dividing line between minor and serious crash is however blurred. Accident would rarely give warning although reckless drivers may anticipate the consequences of their action. In general, motor accident tend to occur where the vehicle user failed to check and maintain the vehicle at the appropriate time. In other word, due and diligent check on motor vehicle can avert immediate crash. According to the Federal Road safety Corps (FRSC, 2010), Annual Report, p. 5), common forms of road traffic accident include:

> *Rear-end Collision*: These types of traffic accident are often caused by sudden deceleration (slowing down or breaking). In some case, another driver is following too closely or accelerates to a higher speed than the car in front of it. The fault is usually attributed to the driver of the car at the of rear-ends the other vehicle; *Head-on Collision*: These types of collision are often fatal. Head-on collisions are exactly what they sound like, they occur when the front ends of two vehicle impact each other; *Multiple Vehicle Collision*: Multiple vehicle collision is sometimes referred to as pile-ups and often occurs on busy roads such as highways and freeways. They can involve many vehicles, and are often very fatal in nature. Vehicle can be impacted multiple times and it may be difficult to escape. It is also difficult to determine fault in these cases; *Single –Car Accident*: Accident involving one car is common. They occur when a vehicle strike an object such as pole, a tree, a fire hydrant or a wall. In some cases, they may involve pedestrian and other bystander. Single car-collision can result in drivers and passenger injury, pedestrian injuries, and often extensive property damage; *Hit-and-run*: An accident where one driver leaves the scene after he must have knockdown a pedestrian or have caused an accident to happen. It can be very difficult to find or determine the identity of the driver or vehicle.

Causes of Road Traffic Accidents.

According to Odugbemi (2010), from the early sixties to late seventies, there were little concerns about road safety matters in Nigeria. Little significant was accorded to road traffic crashes, prevention strategies and remedies. The reason was not farfetched as economic activities were quite low and since transportation is interwoven with the economy, the incident of road traffic crash were invariable low in relation to low vehicle playing the equally scanty routes in the country. However, the emergency of the 1970, and the oil boom saw to increase in the number of motor vehicle on the road, and increase on road accidents involving motor vehicle, bicycles and pedestrians. Analyst began to blame over speeding as the major cause of road accident in Nigeria. As Jacob and Aeron (2000) confirmed, about eighty percent (80%) of the cases of road accident in Nigeria are attributed to reckless driving and over speeding. The authors argued that some road users believed they have the ability to maneuver their way through difficult situation, while others believe in their vehicles ability to wriggle out of any danger.

Increase in urbanization, education, increase in infrastructure development and road network, are also cited as causes of numerical increase in vehicle to meet up with the sharp demand of a developing economy. The increase in the number of motor vehicles and the ever increasing

routes in the cities and highways, are ofcourse not the causes of road traffic accident. In his work on road safety, Stehen, Fischof and Groeger (2009), blamed drivers, some of whom are ill tempered and have no patience to use the road. They have turned to be monstrous plague that are ravaging the fabric of the society, and wreaking havoc innocent road users. For instance, in the year 2013 alone, two thousand people died on Nigerian roads. Many observers attribute RTA to either God or evil spirit while ignoring the human cause by drivers, lack of road sign, bad road network, among others (Asolor, 2010). However, road accident do not simply happen they are caused. The attribution to "evil spirits" is simply because Nigerians know quite a little about what could cause road accident. and likened to that, in the midst of plenty, several other factors can be cited. The level of awareness on the causes of road traffic accident is very low among Nigerians (Rodrigure, 2009).

Vehicle Related Factor

Scholars of the Functionalist's schools have pointed to vehicle related factors in the occurrence of road accidents Chen (2010), Eghosa and Haney (2010). In their observation, a motor vehicle is seen as a system, with functional parts. The parts include the engine, tyre, brake, wiper, etc, which function as organs of the system. Any malfunctioning of the part could result in the vehicle breakdown or accident. The reliability of the vehicle is itself a function of the condition of vehicle.

Beside the functionality of the vehicle parts, every vehicle is designed for a specific maximum load. It is therefore, not surprising that when subjected to stress over and above the provision of the design specification, accelerated wear and tear set in on the vehicle. The net effect of this could result in deterioration of the condition and or body of the vehicle. When wear and tear set in, the body of the vehicle lost its firmness, and the stability of the vehicle can be affected. The brake system working jointly with the accelerator is the main synchronizer of the speed of vehicle; any malfunctioning of the break subsystem should be taken very seriously as a potential source of unavoidable accident.

The tyres are seen as dominant factors in the safety of automobile on the road. Tyre related cause of RTA could be due to one or combination of 'over inflated tyre, thoroughly worn-out tyre, pregnant tyre, and peel-off tyre'. The headlight failure is a well known cause of RTA. As Adiele (2010) observed, light failure (one headlight) has a tendency to misinform and misleads other road users, thereby providing a good opportunity for RTA to occur. Similarly, fail trafficator light will not normally provide the usual warning to the rest of the followers that the vehicle is about to undertake a turn maneuver, For instance, if the vehicle following has a faulty break system or its operator has not allowed for a sufficient safe gap, this could result to traffic crash. Another part of the vehicle that is considering is the engine sub-system, which is considered as the heart of the vehicle. If it developed a sudden failure on the highway, there is the likelihood of causing a traffic crash. Management of the failure of the engine sub-system by and inexperienced operator can cause RTA.

Environmental Related Factor

Some of the well-known factors which falls under this category includes fog, sunray, mist, and rain. These factors contribute greatly to the rate of road traffic crash in Nigeria today. It is expected that drivers who are considered as masters on board of their vehicles should be able to exercise sufficient control over the vehicle. Another environmental factor is the road itself. A significant number of vehicular accidents are traceable to the condition of the road. Recent study by Asolor (2010) has demonstrated that the road is the major factor in road accident in Nigeria. In Akinyemi's (2009) study where he analyzed data on geometric design information system, roadway surface

and road in the country, he found that many roads in Nigeria suffered from low level of design consistency. Anyata (2009) also showed that inadequate drainage could render the road a serious accident threat. Another aspect of the road factor is the general condition of the road itself. Issue of potholes, the indiscriminate location of police check points and the reluctant of the appropriate authorities to continually improve the condition of the road are significant in road accidents.

Human Related Factor

Studies have shown clearly that the single most important contributing factor to road traffic crash in Nigerian is the attitude of the drivers. Driver related issues include sleeping and fatigue, faulty preparation, ignorance of the highway codes and traffic order, driving under influence of drugs and alcohol. In this context, Kaayode (2010), argued that drivers' behaviour can be influenced by impatience, anger, and anxiety, which could lead to traffic accident. The author concluded in his estimation that human factors constitute about 90% of road traffic accident. Out of this percentage, drivers' action or inaction makes up 80% of accident causes.

Human factor can further be classified into overconfidence, speeding, lack of concentration, tiredness, driving under the influence of alcohol, and driving under the influence of drugs. Overconfident drivers often feel that they are master of the vehicle and road. Under such confidence they failed to take the conditions of the tyres, breaks and even the engines into consideration. In terms of speeding, drivers may believe that the faster they drive, the more they impress themselves and others. They however forget that anything can happen to the vehicle, such as tyre burst, beak failure, or pedestrian running across the road. More disasters and causalities are recorded when vehicle travel at higher speed than what obtain at low speed. At 100km/hr, a vehicle move at 28 meter per second. Imagine where driver would be if this vehicle veers off the road for 1 second, bearing in mind that the road is usually 12 meter wide. Many accident prone drivers often forget that they cannot control the road, weather condition and the environment. On-coming vehicle or vehicle being overtaking may do the unexpected, like swerving, stopping or trying to avoid pot holes. Furthermore, some of the roads have narrow bridges hidden at the corner.

Accidents attributed to lack of concentration are traceable to drivers who are fond of engaging in discussions with passengers, answering phone calls, eating, charting, gesticulating, changing radio cassettes, while driving. Lack of concentration is very dangerous as it takes only a moment for accident to occur. The vehicle in front may stop suddenly, hence anything can happen. Additionally, some drivers who drive long distances without even stretching their legs and improving their blood circulation to the brain, may be prone to accident. This is because such long distances may make the driver feel tired and sleepy. It is a frightening experience to be driven by a driver who sleeps while driving. Again driving after a heavy meal can also be hazardous as the blood concentrate in the stomach to absorb the food, thus depriving the brain of oxygen which can cause the driver to fall asleep. Over working also causes fatigue. Some articulated vehicle drivers work an average of 9 to 12 hours per day, which is dangerous.

Another cause of accident is driving under the influence of alcohol. This is significantly related to exhibition of overconfidence by drivers, poor judgment, lack of coordination, and recklessness. In addition to driving under the influence of alcohol is "driving under the influence of drugs". The use of drugs can be interfered with the ability to drive. Sometimes drugs that are prescribed by doctors have sedative (sleep inducing) effect on the driver. Coffee and Kola nut are stimulant that tend to increase the alertness of drivers. Another stimulant popularly taken by driver is Indian hemp which is a street drug, and sometimes cocaine. Such stimulants may work for some times and then tiredness and sleep come suddenly while driving, thus resulting to road traffic

accident. Some drivers have been known to use chewing sticks to keep their mouth active, with the aim of staying awake; but these are not substitutes for rest.

The Federal Road Safety Corp and RTA in Nigeria

Road traffic accident is a daily occurrence in Nigeria, both on the federal and state's road network. Although data of accident on the rural road may not be handy, the Federal Road safety Corp (FRSC) fatal road crash between June 2006 and may 2014 revealed that 15,090 lives were lost to fatal road crash in 3,075 events. The highest fatality occurred in 2013 (2,061 death) a 2.8% increase from the 2012 records of 1,625 death. Between January and May 2014, 964 deaths were recorded on the national scene. Lagos recorded the highest number of fatality (1,579 death from 620 event), while FCT had the highest relative number of death (0.6 death per 100,000 population). On the regional level, a trend analysis show that more people died in the southern part of the country (8,288 people 55%) than in the northern part of the country (6,792 people 45%). In the analysis of the Jacobs (2010), Nigeria is arguable, the most dangerous country in Africa, with 33.7 deaths per 100.000 populations every year, including report of 5,693 fatal road crash in 2009 alone.

A study carried out by Chen (2000) showed that the fatality rate Africa countries range from 10-fold to more than 100-fold. It was also reported that Africa has an average rate of 28.3per 100,000 population traffic mortality compare with 11 in Europe. Looking at the trend and pattern through which these RTA occurred raised concern about the rising incidence of fatal road crash. On May 11, 2011, the United Nation (UN) General assembly (UNGA, 2011) adopted the period 2011-2020 as UN world decade of action for road safety, within which all effort should be concentrated on stabilizing and then reducing global road traffic fatalities by 2020. According to the then UN Secretary General, Ban-Ki Moon, lives "will be saved through this decade of action". Following the Declaration by the UN in 2011, the Federal Road Safety Commission (FRSC) in Nigeria set out to adopt and domesticate the UN action plan by developing a number of programmes suitable for every road user in the country.

Despite interrelated effort toward reducing fatal road crash, Nigerian remain one of the worst hit country with a human population of more than 180 million people, and a high level of vehicular population estimated at over 7.6 million. The country has a total length of about 194,000 kilometers of road, comprising 34,120km of Federal Roads, 30,500km of state road and 129, 580km of local roads. The population-road ratio of 860 persons per square kilometer indicates intense traffic pressure on the available road network. Undoubtedly, this immense pressure contribute to the high road traffic crash in the country (FRSC, 2012).

Statistics from the National Bureau Statistics (NBS) 2016 showed that crude petroleum sub-sector accounted for over 80% of Nigerian foreign exchange from the distribution of refined product across the country. Such wide distribution of crude on poor network of roads suggests some consequences. For instance, in 2011, the FRSC reported that Nigeria had an average of approximately 5,000 tankers involved in wet cargo haulage, moving about 150 million liters of fuel and 2,500 trailers in dry cargo plying Nigerian road daily. Kaayode (2010) revealed that between 2007 and June 2010, a total 4,107 tanker/trailer crashes were recorded on Nigerian road, with a yearly average of 1,148 crashes, monthly average of 96 crashes, with a total of 4,076 persons killed in such the road traffic accidents involving the tankers and trailers.

Curbing Road Accident

Road traffic accidents (RTA) exert huge consequences on lives of travellers, pedestrians, and goods. In Nigeria, the condition of the road and vehicles constitute deep fear on passengers. How to curb road traffic accidents, therefore, has become the concern of many security scholars. In

recognition of these problems, the ancient Roman Empire designed a measure whereby road transportation owners/operators had to hire a slave to serve warning signal to road users. The slave traffic warden would carry a red flag to warn road users of an oncoming vehicles, and for people to leave enough space on the road to avoid possible road crash (Jacob, 2010). Red flag is still a warning sign for road users' today. However, the emergence of science and technology revolution has produced cars with faster speed, which have incorporated gadgets like, horn, braking system, trafficators, head light, and break lights, to serve as warning signs to road users, which can enhance avoiding road accidents.

According to the Federal Road Safety Corps (2009), many accidents can be prevented if drivers are careful of road conditions. Road surface deteriorates in rain, ice and /or snow. The ability to break the vehicle to a stop, therefore, reduces greatly reduce when the roads are not dry. Beside this, may vehicle are often not road worthy when they bear road worthiness badge. Ability to keep the vehicle in good mechanical order, with respect to replacing worn-out tires and brakes as needed. Keeping vehicle in good condition will include keeping the windshield washer fluid full and changing windshield wipers on a regular basis. Untill the advent of the FRSC, many drivers had regarded the wearing of the vehicle seatbelt as either fancy or waste of time. Even with the FRSC, it is common place to see drivers struggling to put on seatbelt whenever they sight road safety officers on the road, and struggling to take of the seatbelt off whenever they pass the spot where the road safety officer had stayed to check vehicles on the road. Not only do seatbelts keep wearers safe in an accident, it also help in avoiding accident as well. Seatbelt will holds the wearing in place during an aggressive maneuver. Whenever a driver makes an abrupt maneuver, the passengers would have to struggle to gain balance inside the vehicle, while some may be thrown to other sides of the vehicle.

In order to avoid accident the Road Safety Corps have warned drivers to avoid "back off and tailgating" vehicles. Avoiding driving next to another vehicle is necessary in case the driver has to swerve to avoid an animal, debris, and or potholes that may be on the road. Ability to watch out and slow down at intersection is also necessary as many accidents often occur at road intersection. Many drivers have either knowingly or unknowingly tried to cross an intersection of the road even when the red light is on. Others have tried to get through the intersection during a yellow light.

The Nigerian traffic rules have been subjected to terrible abuse by long vehicle; which are commonly known as 18-wheelers. These large tractors trailer rings require extra space when making right turns. In the advice of Aderamo (2012), it is better to avoid the right side of 18-wheelers, especially if you think the driver will turn right. Do not drive behind an 18-wheeler on the highway. A blown tire can cause an accident. The author also advised that drivers should slow down and obey speed limit even if every other car is surpassing. This is important since safety personnel often stay hidden from view while looking for speeders.

Drunkenness is another cause of road accidents. Drivers are therefore advised never to drive when they are drunk, and or after consuming alcohol beverages; as even one bottle of beer can alter the ability to drive safely (Eghosa & Haney, 2010). Since some drivers who used the road might exhibit attitudes that are not complementary to road safety, Jacob and Aeron (2000, p. 23), advised that drivers should:

> Always use your signal, even if you think no one is there. When changing lane on the freeway, don't signal as an afterthought or during the lane change. Signal at least a couple of second in advance so that others know what you're going to do before you do it. Avoid dangerous overtaking, as this is responsible for about

45% of all accident. Sometimes the passengers show the driver interesting thing inside and outside the vehicle. This distracts drivers from total concentration. Passengers boarding buses, taxis and private vehicles should take a look at the tyres to see if they are worn out. Some passengers who are in the attitude of encouraging speeding, reckless driving, overtaking by drivers at corners and other dangerous practices by ether cheering on the driver or keeping should know that life and safety on the road is the duty of all road users (driver, passengers and pedestrians).

Theoretical Consideration

In order to assess the causes and casualty burden of RTA, the study adopted the risk homeostatic theory propounded by Gerald J.S. Wild in 1982 (Smith, 2006). The theory proposes that, for any activity, people accept a particular level of subjectively evaluated risk to health and safety in order to gain from a range of benefit associated with that activity. Wild referred to this level of accepted risk as target level of risk. Such risks are accepted in exchange for the benefits the risk-takers hope to receive from that activity. In the context of transportation, the benefits are enormous; ranging from mere leisure, visits, tourism, trading, to general business and or commerce. Transportation has become a huge industry that do not only employ people, but also provides services. In many instances, the amount of risk involved in transportation is taken for granted when the decision to use the road is taken. Thus Wild (1982) argued that when the level of subjectively experience risks is lower than is acceptable, people would tend to engage in action that increases their exposure to risk. If, however, the level of subjectively experience risk is higher than is acceptable, they may make an attempt to exercise greater caution.

Exercising greater caution suggests taking alternative action so that subjectively expected amount of risks matched the level of accepted risk. In this context, accepted risks are compared and the subsequent action is chosen in order to minimize the difference. Here one can chose to take a different means of transportation, such as the train (railway) or use alternative road. However, in a country where the road network seems to be the same (full of pot holes, with poor traffic sign) and railway remained in comatose, road users have very little means of transportation to choose from. Given these conditions, a growing body of evidence exist among safety scholars that only coercive measures that compel road users to obey safety laws can enhance the realization of reduction on RTA and safe lives on our roads (Agrest, 2007; Adiele, 2010). Such coercive measures become necessary because when people become accustomed to some acceptable level of risk, it is always difficult to reduce the risk when they are merely told to reduce it, without backing the request up with force or penalty (Adiele, 2010).

The risk homeostatic theory has been criticized on the fact that it is not only subjectively estimated level of their risk that causes accident. For instance, Ruschena (2012) found that failure that lead to accident can be attributed to combination of factors such as human error, inadequate road design, poor road maintenance, inadequate training of drivers, over speeding, and excessive working hours for long distance drivers. Long and Long (2014) criticized the risk homeostatic theory on the ground that people only alter their behavior in response to the implementation of health and safety measure; but the riskiness of the way they behave remained unchanged, unless the measures introduced are capable of motivating them to alter the amount of risk they will incur.

Findings

Data Presentation

Table 1: Major accidents (Serious and Fatal) on Lafia-Nasarawa Eggon- Akwanga Road 92010-2015

Years	Recorded Accidents			
	Route 1 (Lafia)	**Route 2** (Nasarawa Eggon)	**Route 3** (Akwanga)	**Total**
2010	44	32	16	92
2011	54	28	40	122
2012	58	32	38	128
2013	42	29	28	99
2014	54	39	36	129
2015	42	46	33	121
Total	**294**	**206**	**191**	**691**

Source: Federal Road Safety Commission, 2016

There are three major traffic routes within the Lafia-Nasarawa Eggon-Akwanga road. The summary is as shown in table 1. The RTAs recorded on these routes between 2010 and 2015 are summarized in table 1. The data indicate that route 1 has the highest occurrence of accidents, followed by route 2 and 3 respectively. Between 2010 and 2015, a total of 691 accidents were recorded along the routes. From a total of 92 accidents in 2010, a sharp increase was noticed in 2011 with 122 accidents. It rose to 128 in 2012 and declined to 99 in 2013. In 2014, the number of accident increased again and surpassed the 2012 level by one incident. The decline in 2015 to 121 was not remarkable.

Figure 1 compares the numbers the number of accident along the Lafia-Nasarawa Eggon-Akwanga road during the period under review. The within and between routes differences indicate that RTA along the road had witnessed a yearly increase when 2010 was used as a base year. The rate of increase in RTA along route (Akwanga) was remarkably high (an increase from 16 in 2010 to 40 in 2011) with a yearly increase that attempt to double the 2010 occurrence.

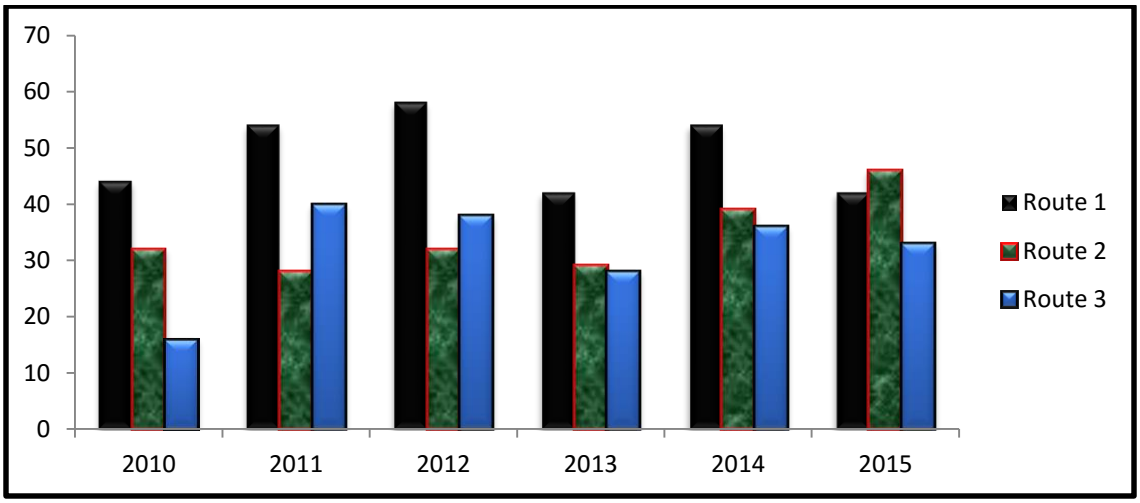

Fig. 1. Major accidents in and through Lafia, 2010-2015 (Source: compiled from FRSC Data)

Major Causes of Road Accidents along Lafia-Nasarawa Eggon-Akwanga Road

Table 2 below provides the summary of causes of RTA along Lafia-Nasarawa-Akwanga road within the period, 2010 – 2015. The causes of RTA are grouped into environmental, human, and

mechanical factors. Environmental factors were defined to include "night time" and "poor weather", while Human factors include "wrong overtaking, route violation, light sign violation, over speeding, dangerous overtaking, and dangerous driving". The mechanical factor included 'vehicle design' and 'road design'. The table shows that 'human factor' have a very high frequency (976) accounting for 69 per cent of the accidents along the route. This was followed by mechanical factors which had a marginal difference with environmental factors with frequencies of 19 per cent and 12 per cent respectively.

A breakdown of the RTA in terms of human factors revealed that wrongful overtaking (WO) contributed 19% of the accidents, route violation (RV) contributed 18% of the accidents, while light sign violation (LSV) caused 9% of the accident, dangerous driving (DD)caused 20% of the accident. The contribution of over speeding (OS) was overwhelmingly 34%. None of the accidents during the period was attributed to dangerous overtaking (DO).

Within the subclassification of environmental factors, accident was significantly elevated by poor weather (PW) condition (51%) than night time (NT) driving (49%). In terms of mechanical factors, poor road design (RD) contributed to accidents much more than poor vehicle design (VD) (62% vs. 38%). The between year differences indicate remarkable improvement in terms of mechanical factors. Accidents attributed to vehicle design had declined significantly over the years, especially in 2012 and 2015. Similarly accidents attributed to poor road design witnessed consistent decline from 48 in 2010 to 9 in 2015. This may be due to some maintenance efforts by the Federal Road Maintenance Agency (FERMA). However, the between year differences with respect to human factors as the cause of RTA along the road revealed a steady increase from the 145 in 2010 to 151 in 2015, with an all-time height in 2013 and 2014. Accidents associated with environmental factors had been on the increase since 2013.

Table 2: Causes of road accident (Minor, Serious & Fatal) along Lafia-Akwanga road, 2010-2015

Causes	Years						Total	% contribution to RTA
	2010	2011	2012	2013	2014	2015		
Environmental Factors:								
Night time (NT)	16	10	14	12	21	11	84	
Poor weather (PW)	22	8	6	15	18	19	88	
Total	**38**	**18**	**20**	**27**	**39**	**30**	**172**	**12%**
Human Factors:								

Wrongful overtaking (WO)	38	33	28	31	36	24	190	
Route violation (RV)	22	16	34	41	31	28	172	
Light Sign violation (LSV)	10	21	13	23	15	4	86	
Over speeding (OS)	41	52	39	61	72	68	333	
Dangerous overtaking (DO)	-	-	-	-	-	-	-	
Dangerous driving (DD)	34	31	36	29	38	27	195	
Total	**145**	**153**	**150**	**185**	**192**	**151**	**976**	**69%**
Mechanical Factors								
Vehicle design (VD)	34	16	7	18	21	7	103	
Road design (RD)	48	37	26	31	17	9	168	
Total	**82**	**53**	**33**	**49**	**38**	**16**	**271**	**19%**

Source: Federal Road Safety Commission, 2016

Pattern And Tend Of RTA Along Lafia-Nasarawa Eggon-Akwanga Road

Following the number of accident recorded on the Lafia-Nasarawa Eggon-Akwanga road over the period, we decided to disaggregate the accidents into minor, major, and fatal to find out the casualty burden of the accidents. Minor accident was operationalized to include those which passengers had minor or nor injury, while serious accidents included those which passengers had serious injury, were hospitalized, and perhaps suffered trauma and permanent injury; or are maimed. The fatal accident include the ones where lives were lost.

Table 3: Pattern and trends of road traffic accident along Lafia-Nasarawa Eggon-Akwanga road between 2010-2015

				Pattern/Trend					
Type of Accident	**2010**	**2011**	**±**	**2012**	**2013**	**±**	**2014**	**2015**	**±**
Minor RTA	17	47	**+30**	73	79	**+6**	17	128	**+111**
Serious RTA	238	208	**-30**	191	121	**-70**	170	400	**+230**
Fatal RTA	80	59	**-21**	68	92	**+24**	57	84	**+27**
Total	**335**	**314**	**-21**	**332**	**292**	**-40**	**244**	**612**	**+368**

Source: Federal Road Safety Commission,2016

Table 3 shows the patterns and trends of RTA along the Lafia-Nasarawa Eggon-Akwanga road between 2010 and 2015. The data reveals positive trend for all categories of accidents within the period. In all RTA had shown a decline between 2010 to 2013 (from -21 to -40), but increased remarkable to +368 between 2014 and 2015. This number was significantly elevated by serious road traffic accidents (SRTA)(+230) over the period. In Figure 2, the pattern and trend analysis indicates that serious RTA that had dropped drastically between 2012 and 2013 was increasing above all other accidents between 2014 and 2015.

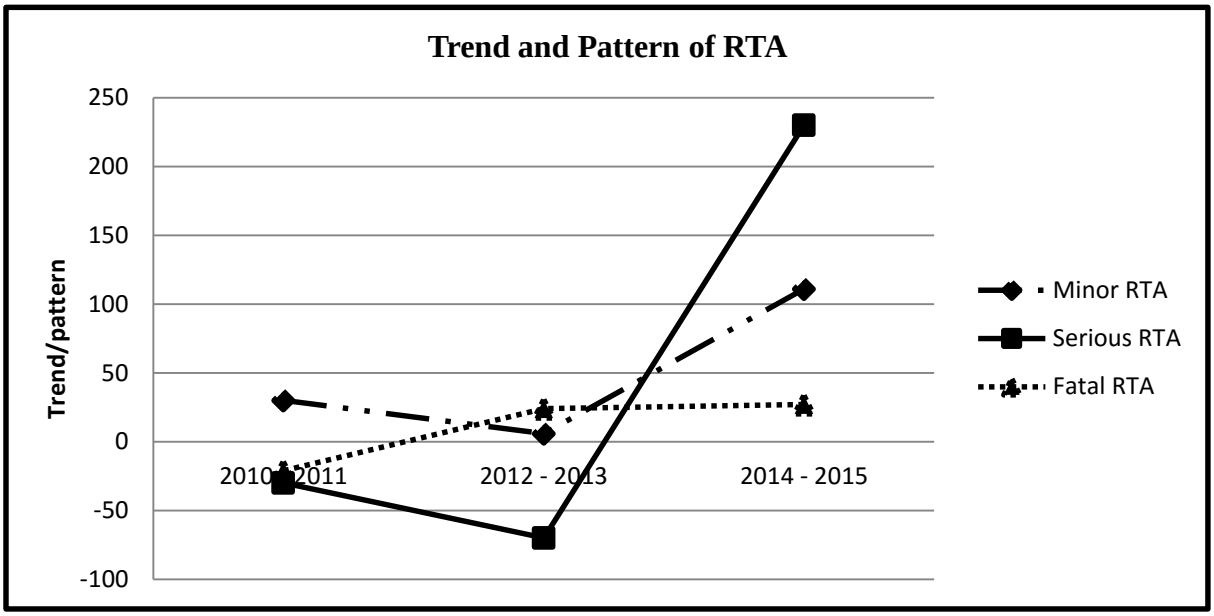

Fig. 2. Trend and Pattern of RTA along Lafia-Nasarawa Eggon-Akwanga Road 2010 - 2015

Socio-demographic profile of the victims

Table 4: Socio-demographic profile of victims of Road Traffic Accidents along Lafia-Nasarawa Eggon-Akwanga Road

Socio-demographic variables	Frequency.	Percentage
Gender:		
Male*	406	68.2
Female*	189	31.8
Age:		
Adult	595	88.01
Children	81	11.9

Total	**676**	**100.00**

Source: Federal Road Safety Commission, 2016. *Excluding children

Table 4 summarized the socio-demographic characteristics of RTA victims along Lafia-Nasarawa Eggon-Akwanga Road. It shows that 406 Males representing 68.2 per cent were involved in RTA from 2010 through 2015, while 189 (31.8%) were females. This findings suggests a higher frequency of male commuters along the road. It also follows from the findings, that for any RTA occurrence, there was a 26.4per cent higher chance that the victims will be males. The classification based on age (classified as adult and children) shows that 595 adults were involved in RTA as against 81 children during the period. This could be due to the lower involvement of children in travelling along the Lafia-Nasarawa Eggon-Akwanga Road

Casualty Burden of RTA along Lafia-Nasarawa Eggon-Akwanga Road

Table 5:RTA Casualty Burden of RTA along Lafia-Nasarawa Eggon-Akwanga road between 2010-2015

Type of Casualty	**Casualty Differential /Year**									
	2010	**2011**	**±**	**2012**	**2013**	**±**	**2014**	**2015**	**±**	**Total**
Injured	1076	776	-300	838	1190	+352	762	1258	+496	5900
Death	108	120	+12	108	100	-8	86	154	+68	676

Source: Federal Road Safety Commission, 2016

Table 5 summarises the casualty burden of RTA along Lafia-Nasarawa Eggon-Akwanga road between 2010 and 2015. The analysis reveals the differences in the casualty figures of passengers. Five thousand nine hundred (5,900) 5900 people were injured as a result of involvement in RTA, while, 676 deaths were recorded during the period. When this finding is compared to table 3 (the number of passengers involved serious accident), it suggests the accidents victims with serious injury later died in the hospitals or while on transit to medical care. In terms of yearly comparison, a reduction of injured passengers was observed in 2011, but increased in 2013 and 2015 respectively. Equally the casualty burden increased in 2011by 12 and in 2015 by 68. increment was recorded in 2011 and 2015 on those that died through RTA while travelling along the route. The overall casualty burden revealed that 12% of those who were involved in RTA along the road during the year under review died, while 88% sustained different degree of injury

Discussion

The Lafia-Nasarawa Eggon-Akwanga road is an important road network that connects the South-south and South-East part of the country to the heart of the North-central region of Nigeria, as well as the capital city of the country, Abuja. Inspite of the usefulness of the road in commerce, and movement of people and services, the road is majorly a single carriage way. Vehicles of all categories: trucks, cars, light and heavy duty vehicles as well as bicycle, motor cycles and pedestrians competes in using the road. Besides being a single carriage way, the road also has a hilly and rocky terrain that span kilometers of some winding corners. These characteristics make accident almost a daily occurrence.

Many scholars have acknowledged that the frequency of RTA along the Lafia-Nasarawa Eggon-Akwanga road was what prompted the opening of Sector RS4.31 Akwanga Unit Command of the Federal Road Safety Corps in the year 1990 and RS4.3 Nasarawa State Sector Command in 1996 (Balogun, 2010). The Federal Road Safety Commission (FRSC) is empowered under Cap 141 laws of the Federal Republic to:

> Prevent and/ or minimize crashes on the highway, clear obstruction on the high way; education road users/motorist on the proper use of the highway, give prompt care/attention to crash victims, conducting research into cause of traffic crash and proffer solutions, determine and enforce speed limit for all vehicle categories, working hand- in-hand with collaborative agencies or group in the serious task of road traffic crash reduction, and make regulation in pursuance of any of the function assigned.

In the context of the Cap 141, some coercive decisions have to be taken to enforce safety on the road. Moreso, when a combination of factors, largely human, play key roles in the occurrence of accident (Ruschena, 2012).

In the course of this study we classified causes of road traffic accident into three: environmental factors, human factors, and mechanical factors. This is in line with the United Nations General assembly (UNGA, 2011) Declaration, and emphasis on the causes of road accidents and the need to curb them. Each of the factors has related issues and /or behaviours that results in RTA. For instance, in this study "environmental factors" of RTA was operationalized into poor weather (PW), and night time (NT). There was no remarkable difference in their contribution to RTA during the period under review. The overall contribution of 'environmental factor to RTA was 125 (table 2). This may not be unconnected with the general awareness especially among experienced drivers about driving in the nights (Aderamo, 2012), and road condition during raining season (Agbonkhese, et al, 2013). However, traffic during night hours appear to be generally low when compared to traffic during the day. Inspites of these, the hilly and rocky nature of the Lafia-Nasarawa Eggon-Akwanga road can constitute hindrance to night drive, and thus become a serious factor on RTA along the road.

However, RTA during the period was significantly elevated by the human factor (69%). Most of the accidents were caused by overspeeding, followed by what the FRSC termed as "dangerous driving", and "wrongful overtaking". Many of the drivers who indulged on routes violation (172) also ended up causing accidents along the road. Light sign violation was also associated with 86 accident that occurred during the period. These findings suggest that the FRSC whose mandate includes "enforcing speed limit for all vehicle categories; and making regulation that can curb accident on our road would need to do more to checkmate human factors in road accidents. The regulation on speed limit that was recently introduced for transporters in the country was a welcome development; but its operation appears to be constrained by the Nigerian factor. Some Road Safety Officers on the road are compromising enforcement, especially when money exchanges hands at check-points, which is a semblance to what some Policemen and Soldiers do at road blocks: collecting illegal fees.

The mechanical factors also contributed to 19% of the accidents that occurred during the time. The hilly and rocky nature of the road explained the poor road design that motorists have to surmount daily to get to their destination. Since the road is a singly carriage way, whenever a truck has accident and/ or fell while trying to climb the hill or maneuver the several potholes on the road, traffic has to be delayed for several hours. There is of course no limit to the daily occurrence of truck falling along the road. Many heavy duty vehicles that carry manufactured goods and farm

produce ply the road, in addition to people on their daily routine activities and businesses. When a truck load of oranges fell, it triggers a chain of lose that ranged from the driver, the owner of the truck, the trader, to the farmers. When the road is blocked for days such that trucks that carry perishable goods cannot pass, it exerts a negative effect on commerce, food prices and household income of farmers. In many instances, the Road Safety Officers had to work day and night to clear the road and make it passable.

The consequences of RTA in terms of casualty was also assessed in this study. The casualty burdens were seen in terms of fatality (death) and the injured. The findings of the study indicated a casualty burden of 6,576 people, who were involved in 691 accidents over the five years (2010 – 2015). This figure suggests an average of 9.5 persons per accident, and 1,315 casualty per year. Out of the 6,576 persons, 5,900 (89.72%) suffered some degree of injuries, while 676 (10.28%) lost their lives. Beside the trauma associated with being injured in the course of a journey, some accident victims may have to live with the injury for the rest of their lives. This happened when the person is maimed and / or getting over the injury may involve going to the hospital from time to get a medical check-up. In this context, living a normal life and doing normal work that he or she was doing before the unfortunate involvement in the accident, becomes difficult. The years lost due to such disability suggest the burden of living with the injury. The disability adjusted life years expressed in terms of the number of active years lost due to accident injury can become huge. For those that died, the sum of years of potential life lost due to premature death, and the years of productive life lost mean much to the country, the community, and the family and loved ones, especially, where breed winners are concerned.

It is difficult to calculate the casualty burden of RTA incurred along the Lafia-Nasarawa Eggon-Akwanga road in terms of Disability Adjusted Life Years (DALY) in this study because the data did not include the average duration that accident victim who were injured took to get healed, as well as the age of the unfortunate victims that died. However, given the findings of this study in table 4, we can conclude that RTAs are serious national problem that affect the economy and health. The burden of accident as seen on the Lafia-Nasarawa Eggon-Akwanga road, call for enforcement of road safety rules as well as massive enlightenment, and traffic sign for motorists and road users.

Conclusion and Recommendations

Two specific objectives were the preoccupation of this study: finding the causes of RTA along Lafia-Nasarawa Eggon-Akwanga road, and assessing the casualty burden of the accident between 2010 and 2015. The findings indicated increased in mortality and injury due to accident over that period. The occurrence of accident was significantly elevated by human factor as opposed to environmental and mechanical factors (68% vs. 12% vs 19%). Based on these findings the study recommended that:

a) The Federal Road Safety Corps should work hard to achieve their mandate of reducing accident and ensuring safety on the Lafia-Nasarawa Eggon-Akwanga road.
b) The Federal Road Safety Corps embark on massive enlightenment programme and education of the motorist and road users on road traffic regulations, and how to properly use the road.
c) Drivers most insure that there vehicles are fitted with good breaks, clean wind screen, seatbelt, and inflated tyres among others, when using the road.
d) In other to guard against over speeding, the officers of the FRSC should ensure strick compliance by drivers.

e) The Federal government should ensure the dualization of the Lafia-Nasarawa Eggon-Akwanga road .

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