

# **ROAD TRAFFIC ACCIDENTS, NATIONAL DEVELOPMENT AND PUBLIC HEALTH IN CONTEMPORARY NIGERIA: ANALYTICAL STUDY OF PLATEAU STATE 2006-2013.**

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## **ABSTRACT**

The increasing level of road traffic accidents in Plateau State and the consequent injuries and deaths strengthened the case for its regular analysis. There is a generally increasing incidence, morbidity and mortality rates of road traffic accidents. Majority of mortalities and morbidities occur in developing Countries. Worldwide, road traffic accidents lead to deaths and disability as well as financial cost to both society and the individual involved. The causes of road traffic accidents are not just human error or driver negligence. Unfortunately, Nigerian highways are arguably one of the worst and most dangerous in the world. Road traffic accident in Plateau State, Nigeria has not received the attention warranted. Reviewing literature on road traffic accidents and their impact and using the time-series description method, road traffic accidents showed an upward trend and significant seasonal influences.

Using chi-square test showed there were significant differences among the various causes of accidents and accident cases (Minor, fatal and serious) with respect to types of vehicles involved over the years. Articles were sort from public libraries, as well as online through internet search engines and relevant information extracted. There is need to view road traffic accident as an issue that needs urgent attention aimed at reducing the health, social and economic impacts. Data on recorded cases of road traffic accidents was collected from the Motor Traffic Division (MTD), Divisional Headquarters, Jos, Plateau State Police Command. Out of 5921 accident cases, reckless driving, inexperience and mechanical fault and road defects accounted for 30.3, 21.5 and 21.1%, respectively. Two motorcycles, motorcycle-vehicle and vehicle-vehicle crashes are the lead types and have resulted in 38.9, 37.5 and 14.9% of the 855 deaths recorded within the period of study. Furthermore, the study showed that private cars, minibuses and taxis accounted for most of the accidents with 94.7% of the total accidents.

## **KEYWORDS**

Road traffic accidents, Vehicle, Uncontrolled accidents, Plateau State, Traffic laws in Nigeria, Nigeria Police Force(NPF).

## **INTRODUCTION**

Road traffic accidents occur when a vehicle collides with another vehicle, pedestrian, animal, road debris, or other stationary obstruction, such as a tree or utility pole (Jacob, 2010). Worldwide, road traffic accidents lead to death and disability as well as financial cost to both society and the individual involved. There is generally increasing incidence, morbidity and mortality rates of road traffic accidents. Road traffic accidents injure people every day, more so in developing countries like Nigeria, Owo, Onibere and Asalor (2010). The enormity of the problem is not appreciated hence enough preventive measures are not taken. Road traffic accidents occur worldwide but the incidence is more in developing countries. Annually, it causes about 1.2 million deaths globally (WHO, 2004). Road traffic accident is a leading cause of death in adolescents and young adults worldwide. Majority of mortalities and morbidities occur in developing countries. In Nigeria, trauma is the main reason for emergency room visits and road traffic accidents are responsible for the majority of deaths. Road traffic injury rate is about 41 per 1000 population and mortality from road traffic injuries is about 1.6 per 1000 population. This is significant when the fact that majority of these injuries and deaths can be prevented. It becomes worrisome with the fact that the incidence is increasing. Road traffic accidents have several implications/cost. It has physical, social, emotional and economic implications. According to volume 2 of WHO's 7<sup>th</sup> Report on World health Situations, global economic cost of road traffic accidents is estimated at \$518 billion per year in 2003 with \$100 billion of that occurring in poor developing countries. Nigeria loses about 80 Billion Naira annually to road accidents. According to Nantulya and Reich (2002), of all subjects that are involved in road traffic accidents in Nigeria, 29.1 per cent suffer disability and 13.5 per cent are unable to return to work. Hence, the cost of road traffic accidents includes the cost of private property and public amenities damaged, including the cost of medical treatment and the cost of productivity lost due to the accident.

## **STATEMENT OF THE PROBLEM**

The rapid rate of uncontrolled and unplanned accidents in the state has brought with it complex urban health related problems. This implies a situation where health facilities become overcrowded and inadequate for the growing population. The distribution of health personnel and institutions are also inadequate. One of the most serious health problems facing Plateau town is the uncontrolled accidents on roads, which resulted from poor roads, over speeding and drunkenness. This is due to inadequate medical facilities and national development plan to care for the injured individuals leading to the spread of various infectious diseases within the metropolis.

It is against this backdrop that this research seeks to explore the road traffic accidents, national development and public health in contemporary Nigeria: analytical study of Plateau State - 2006-2013.

### **OBJECTIVE OF THE STUDY**

This research will study the following:

1. Road traffic accidents in Nigeria using Plateau state as a case study
2. National Development; impact of national development and per capita income on road traffic accidents
3. Public Health; the inadequate and poor state of public health facilities and inadequate personnel as a key factor in fatality resulting from road traffic accidents

The study will analyse these objectives generally in Nigeria with detailed emphasis on Plateau State from 2006 to 2013. The study will also make sound recommendations that will create a balance between road accidents, national development and public health system.

### **RESEARCH PROPOSITION**

Road accidents have threatened the public health system in Nigeria due to its attendant consequences.

### **SCOPE OF THE STUDY**

1. The study will examines road traffic accidents, national development and public health in contemporary Nigeria and bring to the front burner for government and the public the need to urgently address the issues raised immediately.
2. Plateau State in north central Nigeria was used as a case study,
3. The researcher considered the period 2006 - 2013, since this period is reasonable enough to ascertain the variables under study.

### **HYPOTHESIS**

H<sub>0</sub>: Road accidents do not significantly affect public health system in Plateau State Nigeria.

H<sub>1</sub>: Road accidents significantly affect public health system in Plateau State Nigeria.

H<sub>2</sub>: The people residing in Plateau State do not have access to basic infrastructure due to current state of national development.

H<sub>3</sub>: The people residing in Plateau State have access to basic infrastructure due to current state of national development.

## **REVIEW OF RELATED LITERATURE:**

Literature was reviewed on thematic basis for clarity.

### *ROAD TRAFFIC ACCIDENTS*

Anything that happens by chance is an accident. Accident is also anything occurring unexpectedly and un-designed, (Odugbemi, 2010). Road accident does not just happen; something causes it. Given the fact that Nigeria has the highest road accidents rate as well as the largest number of death per 10,000 vehicles (Sheriff, 2009), one may be tempted to believe that the level of awareness on the causes of road traffic accidents is very low among Nigerians. On the contrary, however, (Asalor, 2010) has shown that Nigerians know quite a lot about what could cause road traffic accidents and likened the situation to that in which in the midst of plenty, there could be hunger.

Road traffic accident is therefore an unexpected phenomenon that occurs through the use or operation of vehicles including bicycles and handcarts on the public highways and roads. Accidents may be fatal, resulting in deaths of the road users (passengers, drivers or pedestrians), or minor when it is not severe enough as to cause substantial hardship. The dividing line between minor and serious accident is however blurred. As has been defined, accident would rarely give warning although reckless drivers should anticipate the consequences of their recklessness. In general, accidents do not just occur; human recklessness, carelessness or negligence causes them. Even where the immediate cause of a road accident is attributable to mechanical factor, carelessness in the form of omission to check and maintain the vehicle at the appropriate time would have remotely contributed. Trivial checking and maintenance of the vehicles could avert an imminent accident.

In the ancient Plateau Empire, road transport owners / operators in the 11th century must provide a slave who will carry a red flag to warn other road users that a motor car is coming and leave the road space to avoid possible road accident (Jacobs, 2010). Today the car has a faster speed and the need to incorporate gadgets like, the horn, braking system, traficators, headlights and break-lights to avoid road accident.

Before the 'Oil boom' in Nigeria, road accidents were rather rare. The oil boom brought along with its 'rapid' industrialization, which calls for improved accessibility. Hence, government responded by building roads without due attention to standard. As the disposable income of people grew vehicle ownership increased. According to (Sheriff, 2009), not all these

growth/developments took place with adequate measures and control. Consequently, the roads grew to become a death trap for Nigerian citizens. These are indirect factors of road accident in Nigeria.

## **CAUSES OF ROAD TRAFFIC ACCIDENTS**

The issue of road traffic accidents is one that requires great care in handling, as it is hydra headed in nature. The major causes of road traffic accidents are:

- a. Vehicle related factors
- b. Human related factors
- c. Environment-related factors

### *VEHICLE RELATED ISSUES*

According to (Ovuwori *et al.*, 2010), tyres, engines, braking system and lights system are among vehicle subsystems whose malfunction can cause road traffic accidents. The vehicle itself is a component of the road traffic system. Consequently, its reliability positively correlates with accident causation on the road network it plies. The reliability of the vehicle is itself a function of the condition of vehicle.

The following vehicular issues cause a good number of the accidents on Nigerian roads; I will attempt to discuss them:

### *VEHICLE DESIGN*

Every Vehicle has its specified maximum load; this is maximum load is always indicated. It is therefore, not surprising that when subjected to stress over and above the provisions of the design specifications, accelerated wear and tear set in on the vehicles. The net effect of this could result in deterioration for the condition of the vehicle.

Defects in design affect the condition of the vehicle once it is on the road. If operated under normally conditions or otherwise, the defect may result in possible road accidents. Recall in Africa is not yet entrenched so any defect from manufacturer is born by the user(s) whether accidents results or not.

### *THE VEHICLE BODY*

The body contribute to some measure in causing road traffic accidents; though less prominent is the firmness of the structure of the vehicle. Hanging parts of the body of a vehicle though rare can greatly affect the stability and hence the level of control by the operator.

### *THE BRAKE SYSTEM*

The brake subsystem, working jointly with the accelerator is the main synchronizer of the speeds of vehicles. The brake sub-system malfunctioning should be taken very seriously as a potential source of unavoidable accident.

### *THE VEHICLE TYRES*

The tyre is a dominant factor in determining the safety of automobiles on the road. Tyre related causes of road accidents could be due to one or a combination of:

- Tyre(s) (are) overinflated
- Thread are thoroughly worn-out
- Tyre(s) is (are) 'pregnant' and
- Tyre(s) is (are) rear peel-off

### *THE VEHICLE LIGHTS*

Vehicle lights fall into two broad categories, namely those that are useful at all times (i.e. in daylight, in darkness and in poor weather) e.g. headlights. Although it is well known that the failure of vehicle light is a major factor in road traffic accident. As pointed out by Adiele (2011), light failure (e.g. of one headlight) has a tendency to misinform and mislead other road users thereby providing a good opportunity for an accident to occur. Similarly, a failed trafficator light will not normally provide the usual warning to the rest of the followers that the vehicle is about to undertake a turning manoeuvre, for instance. If the vehicle following has a faulty brake subsystem or its operator has not allowed for a sufficient safe-gap, this could result in an accident.

### *THE ENGINE*

The engine sub-system is the head of the vehicle and should be as one whose sudden failure on a highway is more likely to cause an accident if the volume of traffic is sufficiently high. Even when the traffic is reasonably low, mis-management of the failure by an experienced operator could cause an accident.

### *HUMAN AND ENVIRONMENTAL / ROAD RELATED ISSUES*

Some of the known factors that fall under this category include fog, sunrays, mist and rain. These in no small measure contribute greatly to the rate of road traffic accident in Nigeria today. The operator who is the master 'on board' should to be able to exercise sufficient control over the vehicle. A significant number of vehicular accidents are traceable to the road. Recent studies (Asolor *et al*, 2008) have demonstrated that the road is another major factor in road traffic accidents in Nigeria. (Akinyemi, 2009) collected and analysed 'data on geometric design information system, roadway surface and road side conditions on seven two lane rural roads in the country. It found that rural roads in the country have low levels of design consistency, sight distance on and between geometric features as insufficient for stopping and overtaking adequate traffic control devices and unforgiving roadsides'. He then argues that their deficiencies are due largely to inadequate road design specification and maintenance. Anyata (2009) on the other hand 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. Issues of potholes, the indiscriminate location of police check points and the reluctance of the appropriate authorities to continue to improve on the condition of the roads are significant in road accidents.

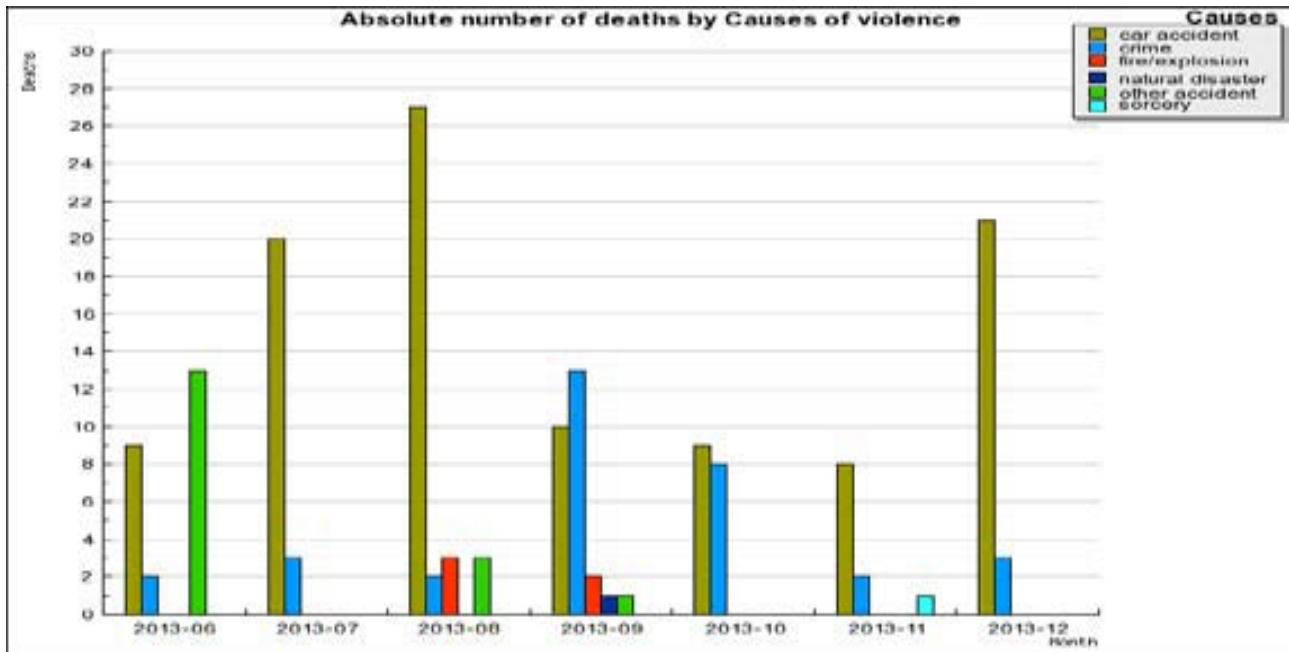
### *DRIVER RELATED FACTORS*

Studies have shown clearly that the single most important contributing factor to road traffic accidents in Nigeria is the attitude of the driver to driving code and etiquette. Driver related issues include sleepiness and fatigue, faulty preparation, ignorance of highway codes or traffic orders, driving under the influence of drugs and or alcohol and inexperience.

### **IS PLATEAU STATE PRONE TO ROAD ACCIDENTS?**

Plateau State, one of Nigeria's political and administrative capitals, has not sufficiently demonstrated that it is free of the incessant road accidents that characterize most highways across the country. Despite its first-class road networks and the heavy presence of state security agents like the Nigerian Police Force, the Road Safety Corps and the Vehicle Inspector officers, the capital city continues to experience numerous fatalities on its highways. In fact, road accidents are the number one cause of violent deaths in the Jos, Plateau state. Other prevailing causes of violent deaths in the capital city include crime, fire/explosion, natural disaster, other accidents, and sorcery, as documented in the Nigeria database. The following figures exhibit a noticeable trend in the causes of civil violence between the months of June and December 2013.

Figure 1: Leading causes of violent death in Plateau state, Nigeria



Source: Graph developed from data obtained from Nigeria Police Force (NPF), Federal Road Safety Corp (FRSC) and National Emergency Management Agency (NEMA)

The above trend indicates that road accident was the main cause of violent death for the months of July, August, October, November and December. Road accident also ranks second for the month of June (after Other Accidents) and September (after Crime). A pattern of fatalities in the period under consideration is identifiable across the six municipalities that make up the Plateau State.

Ironically, the construction of the Plateau–Abuja expressway has been under construction for more than 10 years without any serious improvement. The rising death tolls on this road may not abate in the near future if the construction overseers fail to expedite completion of the expressway. Government and other stakeholders should therefore, take appropriate action to increase safety for road users. Even as simple as taking care of the bad spots that have become death traps for drivers that have little knowledge of the bad sections of the roads.

### GOVERNORS’ CONVOYS AS METAPHORS OF EXECUTIVE HIGHWAY KILLERS

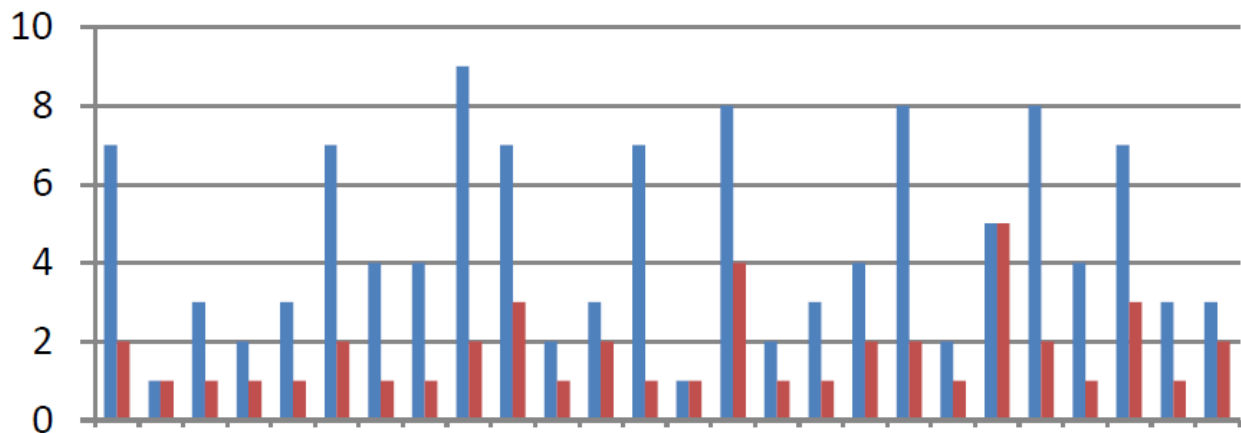
The cases of over-speeding governors’ convoys on our pothole-ridden roads continue to be a source of concern. Despite their constitutional role as the Chief Security Officers of their respective states, our governors and other VIPs blatantly disregard traffic rules, violating other road users’ rights and endangering lives. Since 2007, there have been many cases of irresponsible and deadly lawlessness perpetrated by convoys of state executives. The figure



below shows annual deaths resulting from accidents caused by governors' convoy and frequency of such accidents from 2007 to 2013.

The blue columns represent the number of deaths, while the red indicate their frequency for each year. This analysis shows clearly that the cases of fatalities involving governors' convoys are not recent happenings.

The public were incensed only with the recent killing of Prof Festus Iyayi, when the convoy of Kogi State Governor Mr Idris Wada rammed into the professor's vehicle. Past trends ought to have provoked an outcry long before this. Convoys of at least 26 governors, including those of Plateau, Ekiti, Edo, Ogun, Katsina, Ondo, Delta, Imo, Nasarawa and Gombe, have been involved in fatal accidents since 2006. The following chart shows the trend by location, deaths and frequency since that year.



The emerging trend is that well over 75% of the states of the federation have had their share of the highway carnage characterizing the movement of state executives. The chief Security Officers of states constitute arguably a greater threat to the security of the lives of their citizens than other road users.

### NATIONAL DEVELOPMENT

National, according to Longman dictionary of contemporary English, refers to a phenomenon that embraces a whole nation. The overall development or a collective socio-economic, political as well as religious advancement of a country or nation is termed national development. This is achievable through development planning, which describable as the country's collection of strategies mapped out by the government.

### *NATIONAL DEVELOPMENT PLANS IN NIGERIA*

We have had series of development plans in Nigeria. Its fifty-three years of independence actually are rolling by daily in search of development. The myth of growth and development is so entrenched that the country's history passes for the history of development strategies and growth models from colonial times up to date. No term has been in constant flux as development. This seems the only country where virtually all notions and models of development have been experimented (Aremu, 2003).

Nigeria formulated, between 1962 and 1968, her first national development plan, just two years after independence, with the objectives of development opportunities in health, education and employment and improving access to these opportunities, etc. This plan failed because fifty percent of resources needed to finance the plan was to come from external sources, and only fourteen percent of the external finance was received (Ogwumike, 1995).

Collapse of the first Republic and the commencement of civil war also disrupted the plan. After the civil war in 1970, the second national development plan (1970 to 1974) were launched, the plan priorities were in agriculture, industry, transport, work force, defence, electricity, communication and water supply and provision of social services (Ogwumike, 1995). The third plan covering the period of (1975 to 1980) was more ambitious than the second plan. Rural development and efforts to revamp agricultural sector were the focus. The fourth plan (1981 to 1985) recognized the role of social services, health services. The plan aimed at bringing about improvement in the living conditions of the people. The specific objectives were an increase in the real income of the average citizen, more even distribution of income among individuals and socio-economic groups, increased dependence on the country's material and human resources, a reduction in the level of unemployment and underemployment (Ogwumike, 1995).

During these periods, Nigeria did not invest her enormous oil wealth to build a viable industrial base for the country and for launching an agrarian revolution to liquidate mass poverty. For instance, the Green Revolution Programme that replaced Operation Feed the Nation failed to generate enough food for the masses. In the recent past, various strategies for development have also been tried with little or no result; among these were the structural adjustment programme (SAP), Vision 2010, national economic empowerment and development strategy (NEEDS), creation of development centres, etc. currently, seven point agenda of the present administration with vision 2020 without any clear methodological approach towards achieving them. It is obvious that the current results so far are not what development connotes.

### *THE PROBLEMS OF NATIONAL DEVELOPMENT IN NIGERIA*

In spite of series of development strategies, put in place by successive governments, and sometimes with good intentions, all attempts to generate meaningful development proved futile. Based on this, the country has these puzzles: “Were those previous development plans or strategies bad in their context, or wrongly projected?” If nothing was wrong with the plans, then why is it still difficult to generate meaningful development in spite of the huge resources at our disposal? The solutions to these puzzles are not farfetched. Many factors have combined to fetter the nation’s development.

One, there are in most cases, no executive capacity responsible for the formulation and implementation of the plan. What we usually see are officials entrusted to such a position but without any meaningful executive authority.

Some of the previous development plans failed because; there was little or no consultation of the public. Planning is supposed to involve even the peasants in the villages. They even did not consult the local government officials who are close to the people. Planning is not an edifice where technocrats alone operate (Mimiko, 1998).

Lack of good governance also militates against national development. Where there is no good governance, development becomes a mirage. This is because of bad leadership in the country. Most of our leaders have no sense of commitment to development.

Mimiko (1998) captures the situation this way: “*The decolonization allowed the crop of leaders that aligned with colonial power to take over Nigeria. This ensured the sustenance of a neo-colonial economy even after political independence. These leaders on assumption of power quickly turned up the repressive machinery of the colonial state rather than dismantling it. Significantly, they have no vision of development to accompany the efficient instrument of repression they inherited. All they were interested in was access to power and privileges and not development*”.

High level of corruption and indiscipline is another barrier to development. Nigeria state is corrupt, managed by corrupt leaders who have made the state an instrument of capital accumulation, rather than using it to project the interest of the citizenry. A very good plan supervised by a thoroughly corrupt state can hardly do a thorough good job (Mimiko, 1998). Corruption and development are antithetical to each other, the two cannot cohabit, and so, where one is present, the other suffers.

Another important factor is the mono-economic base of the country. The country largely depends on crude oil for her survival to the detriment of other resources. They neglected all other sectors of the economy. For instance, government threw into limbo, over the years, agriculture, which constitutes the mainstay of the Nigerian economy in the 1950s and 1960s. How would government encourage export promotion when there is virtually nothing to export? The economy is undiversified and this is not suitable for a sustainable development (Mimiko, 1998).

*MODELS OF DEVELOPMENT: ASIA IN CONTEXT*

The enviable growth and development patterns of several Asian countries are well known. East Asia is the only region in the world that has been able to maintain strong, consistent growth patterns over several decades, led first by Japan and the newly industrializing economies of Hong Kong, South Korea, Singapore and Taiwan, etc (Mimiko, 1998; Adelman, 1995).

Apart from the homogenous nature of these societies, several other factors were responsible for their development. These factors include development of agricultural sector, a system of mass education, development of indigenous industries, export-oriented strategy. Other factors are the discipline of their leadership, existence of efficient bureaucracy, human resources development, encouragement of a dynamic private sector working in co-operation with the government towards a society-wide vision of development, institutional capacity building and attention to the problems of governance, consistency and policy stability (Mimiko, 1998).

*STRATEGIES FOR NATIONAL DEVELOPMENT*

The beauty of any development plan is the faithful implementation of such plan, which its success lies with the implementers. In our previous discussion, it is on record that most of the past development plans failed due to implementation problems and lack of committed leadership. Based on this fact, new development policies and strategies are currently in place as alternative strategies for development, such as Seven Points Agenda, Vision 2020. These policies and vision appear to be all-embracing but they are not sacrosanct in their totality. However, if faithfully implemented, the nation at least will move towards the path of development. It is in our opinion that for successful implementation of the Seven Point Agenda of the present regime in Plateau state, there are some lessons they can learn from Asian models of development.

First, development requires total commitment on the parts of the leadership. The need for discipline and honesty on the part of the project implementers cannot be over emphasised; such officials should show enough discipline, interest, willingness, dedication and honesty. Without these attributes and the will to pursue set economic goals, all other ingredients of development present would amount to nullity.

Second, this country should learn that wholesale liberalization; the type advocated by the apologists of orthodox SAP is not necessarily synonymous with development. It goes without saying therefore that a level of state involvement (heterodoxy) is imperative even in the face of the crucial need for structural adjustment. Nevertheless, whatever the degree of state involvement, there must be a guarantee for private ownership of properties for investment to get stimulated (Mimiko, 1997). It is another question whether the Nigerian state as presently constituted can play this critical role given its embarrassing level of corruption, inefficiency and incapacitation by commitment to sundry primordial values. Be it as it may, the goal should be to evolve a process of reformation of the state to make it able to play the type of highly constructive role that its counterparts are playing in the whole of East Asia (Mimiko, 1997).

In addition, stability and continuity of policies encourage investment and propel development. For instance, in Korea, the assassination of Park did not change the policies he put in place they remained. Nigeria leadership must learn to build on policies rather than to jettison them for new ones for the sake of party politics and personal aggrandizement.

There is the need for Nigeria to revamp the agricultural sector; this sector was instrumental in the development of Japan. Agriculture used to be the mainstay of Nigeria economy but the discovery of crude oil succeeded in putting agriculture into state of standstill or oblivion.

Human resources development is also a sine qua non to Nigeria national development; Japan and Korea demonstrated this (Lawal *et al*, 1976). Development depends very much on human knowledge and skills. Hence, achievement of high quality education and training for a large majority of the populace at a reasonable price and the context that is relevant and adequate to the country's development needs is a necessity. It is the people that develop, affirms development literatures, and that unless there are large numbers of suitably qualified people, development cannot take place.

There is need for attitudinal change. Nigerians must actually change their pessimistic attitude towards development. The idea or belief that "things cannot work in Nigeria or Nigerian factor" should be discouraged. Real development is achievable through internal activities rather than from external influences. Development is as a process generated within a society by forces propagated and invigorated by the actual members of that society. Outsider cannot start and sustain true development. Although, no country can develop in isolation, but emphasis should not be on foreign resources for the country's development. The models of development of Japan and China show how these countries utilize their internal resources both human and material for rapid economic development. It is reasonable that Nigerians should inculcate a high sense of patriotism as demonstrated by the Japanese and Chinese.

It is important to promote citizenship over indigeneity in order to achieve cooperation and participation of all communities in the development process. Omotoso (2008) noted that the 1999 constitution directly or indirect promotes indigeneity in the country. For example, section 318(1) of paragraph (IV) supports indigeneity. The constitution sets parameters for indigenes and non-indigenes. It equally gives legal bases to various discriminatory policies that actively promote indigeneity, contrary to some sections that argue against discrimination. This is contradictory. Leadership in Nigeria must behave in a way to inculcate the spirit of patriotism in the minds of the people, so that they will be ready to stand with the government in her development efforts. When Nigerians see themselves as one and not as belonging to one ethnic nationality or the other as portrayed presently, the urge to develop Nigeria will be cultivated.

Additionally, the need to reform electoral process is imperative for socio-economic and political development. Electoral fraud is one of the banes of Nigeria's development. The role of leadership in development cannot be overemphasized; all efforts towards development must be well coordinated and directed by the leaders. Therefore, the leaders must be development conscious, have genuine interest for development and the political will to propel such

developmental agenda. The leaders must also seek the cooperation of the people, because, it is the people that develop a nation. Honestly, the aforementioned ingredients are not possible without a legitimized mandate for the leaders by the people. When a leader assumes office illegitimately or through electoral fraud, such leader is bound to fail in his effort to generate meaningful development. This is because illegitimate leaders tend to display characters that repress development such as; selfishness, corruption, pride, thuggery and inefficiency. There will also be apathy and natural detachment from development plans by the people, as they did not see such emerging leaders as the products of their consent through voting. Based on the foregoing, there is need to reform the electoral process in such a way that nobody assumes power (political) through crook or fraudulent means. Opened, free, fair and competitive the process should be. Swearing in must wait until all legal battles after the elections are concluded. This will create genuine environment conducive for development.

Lastly, development plans should be a holistic and an all-encompassing national issue that cuts across economic, social, political and psychological aspects of the citizens and the country, and not just exclusively an economic issue.

## **PUBLIC HEALTH**

The dimensions of health can encompass “a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity”. As defined by the United Nations’ World Health Organization, Public health incorporates the interdisciplinary approaches of epidemiology, biostatistics and health services. Environmental health, community health, behavioural health, and occupational health are other important subfields (WHO, 2005). Just as studies of the impact health on urbanization reveal that urbanization can have both positive and negative effects on health. Urban life can be rich and fulfilling since it is more diverse, stimulating, and full of new opportunities. Individual and family mobility make it easier to escape from oppressive social relationships. Cities are sources of ideas, energy, creativity, and technology. They can, foster enlightened, congenial, and multicultural living (McMicheal 2000).

Health Reform Foundation of Nigeria (2012) affirmed that, urbanization is a public health issue. There is the need to have urban planning, decongest the urban areas by ensuring peripheries are provided essential amenities such as good roads network water, electricity, health facilities and good schools. In addition, tackling environmental sanitation issues need be in the front burner, while facilities for recreation and walkways should be provided on roads for health-walk “he stated. Iyun (2009), also affirmed that the “health status of urban people is expected to be worse in comparison with those in the rural areas considering their various health challenges such as poor sanitary conditions, lack of potable water and high pollution level.

Abiodun (2010) explain the need for Nigeria to explore and strengthen other mechanisms of health system and shift focus from out-of-pocket payments, address the issues that have undermined public health care financing in Nigeria, improve on evidence-based planning, and prompt implementation of the National Health Bill when signed into law. Onwujekwe *et al* (2010) explain that, In spite of the various reforms to increase the provision of health care

services to the Nigerian people, health access is only 43.3%. The inadequacy of the health care delivery system in Nigeria is attributable to the peculiar demographics of the Nigerian populace. About 55% of the population lives in the rural areas and only 45% live in the urban areas. Moe et al (2007) opined that, Provision of timely information aimed at combating possible health menace among many other things is an important function of public health. Hence, inadequate tracking techniques in the public health sector can lead to huge health insecurity, and hence endanger national security.

Ekudayomi and Adekpoju (2008) in their study, “Public Health and Population Growth” revealed that available health facilities/infrastructure in the cities become over stretched as urban population continue to rise. They further explained that, failure of the Nigerian government to respond adequately to the increasing demand for urban Health infrastructural services has had the following consequences like, deteriorated quality of life in the city, the inadequate provision of infrastructural services, shortage of drug, and decline in the productivity of workers. In the same way, Harris (2003) advised that in order to avert the consequence of uncontrolled urbanization on public health, government across the world must, make it a priority, devise ways to plan their cities, improve urban living conditions, like water and sanitation, housing, transportation, promoting health behavior and safety condition.

## **THEORETICAL LITERATURE**

### *CAUSES OF ROAD ACCIDENTS*

The causes of road traffic accidents are multi-factorial. These factors are divisible into driver factors, vehicle factors and roadway factors. Accidents causative factors are a combination of these factors. Driver factors solely contributes to about 57 per cent of road traffic accidents and 93% either alone or in combination with other factors Driver factors in road traffic accidents are all factors related to drivers and other road users. This may include driver behaviour, visual and auditory acuity, decision-making ability and reaction speed. Drug and alcohol use while driving is an obvious predictor of road traffic accident, road traffic injury and death. Speeding, travelling too fast for prevailing conditions or above the speed limit, is also a driver factor that contributes to road traffic accidents. The risk of being injured increases exponentially with speed much faster than the average speed. The severity of injury depends on the vehicle speed change at impact and transfer of kinetic energy. Though vehicles travelling slower than average speed are also at increased risk of road traffic accidents, most involve speed too fast for the conditions.

Vehicular factors are divisible into vehicle design and vehicle maintenance. Some safety features of vehicles like seatbelts and airbags are likely to reduce the risk of death and serious injuries. A well-designed and maintained vehicle is less likely to be involved in accidents. If the brakes and tires are good and the suspension well adjusted, the vehicle is more controllable in an emergency and thus, better equipped to avoid accidents. Road design and maintenance is also a factor that contributes to road traffic accidents. The causes of road traffic accidents are not just human error

or driver negligence. Unfortunately, Nigerian highways are arguably one of the worst and most dangerous in the world.

## **EMPIRICAL LITERATURE**

### *ROAD ACCIDENT PREVENTIVE MEASURES*

This section discusses the major issues of preventing or measures generally taken to prevent road traffic accidents.

### *TRAINING AND RETRAINING*

The training and retraining of drivers constitute a formidable means of effectively dealing with the issue of reduction of road traffic accident. The road traffic system itself is dynamic in nature. Therefore, the training and retraining of operators of vehicles is a necessity. This measure is the only means of ensuring that operators entering or remaining in action in the system have the necessary skills.

### *ENGINEERING*

This is one of the four strategies popularly known by road safety practitioners and scholars as the 'FOUR E's'. According to Sanders (2010), engineering will normally focus on those elements that deal with safer vehicles and improved vehicle design. The real point here is that engineering as a counter measure is that it ensures that a high reliability is achieved at the design stage and consequently the occurrence of failure of the vehicle while in operation is maintained.

### *EDUCATION*

Education is another means of effectively reducing road traffic accidents. Nigerians are well aware of the factors that could cause road traffic accidents. Education can prepare the ground for more long-term attitude and behaviour changes and therefore, that road safety education should start with pre-school age groups and continue through a child's formal education.

### *ENFORCEMENT*

Traffic laws are for the protection of all road network users. In order for the laws to have the desired effects, enforcement by the various laws, enforcement agencies must be fair and just.



Experience has shown that in countries where enforcement is adequate, road traffic accidents have declined.

### *EVALUATION*

Evaluation is a proven means of providing a basis for remedial actions. Consequently, this serves as another effective means of knowing when and what kind of further actions are required in order to achieve a visible reduction in accident tallies.

### *INVESTIGATION*

The proper investigation of accidents is yet another rather effective means, though remote, of achieving some reduction in accident. The hypothesis here is that a driver who is aware that the extent of his fault in an accident is identifiable by a thorough investigation is more likely to be careful.

### *MAINTENANCE*

Maintenance in all its ramifications is one of the most effective preventive measures that any individual or organization can take to maximize the output of his, its accident reduction / prevention programme. Any maintenance programme expected to make a meaningful and sufficient impact must of necessity, address three major aspects namely, the road network, the vehicle and the driver.

### *BUDGETING ISSUES*

Budgeting is a major nuisance factors as it is not within the control of the average road user. Any maintenance programmes without an adequate budget is as good as the 'do nothing' solution option of the system approach. Therefore, a remote way of ensuring accident reduction/prevention is for government, charged with the responsibility for good maintenance, to draw up and implement to the letter on regular basis, budgets that match the demands of the road network and its infrastructure.

### *THE OPERATOR/DRIVER*

The driver himself is subject to physiological wear and tear. As the driver is the main actor in controlling the factors responsible for accidents, it is imperative that he be both physically and mentally alert when operating the vehicle. Consequently, the driver requires adequate

maintenance, which may come in the form of welfare scheme, health service programme, retraining.

## **METHODOLOGY**

This study used survey research method. This is because of its exploratory nature. The researchers also employed both primary and secondary sources of data collection. We used questionnaires in collecting primary data while secondary data came from related literatures, textbooks, journals, bulletins and periodicals.

## **MATERIALS AND METHODS**

The study used data obtained from the Motor Traffic Division (MTD) and Nigeria Police Force (NPF) that comprises of Plateau Police Division (PPD). The Director General of Traffic (DGT) of PPD is the sole authority to record, analyze and publish all data related to traffic accidents in Plateau State. Road traffic accident (RTA) reports of the Federal Road Safety Corp (FRSC) and related data from PPD is thought to be of high coverage, because of enforcement of a law that car insurance companies, garages or repair establishments could not accept a vehicle involved in an accident for insurance claim and repair if a police report is not produced. Similar traffic laws exist in other different Nigerian States (El-Sadig *et al*, 2002, Ziyad and Akhtar, 2011). Nevertheless, the true number of RTA and related fatality and injury are likely to be higher in Plateau than it is reported by PPD, as it omit the accident cases that results in minor damage, injury or causality and overlook minor self accidents or the accidents cases that are settled by the parties mutually at the scene. The definition of RTA includes all traffic related accidents that result in injury or death to road users. RTA injuries are defined as all traffic related non-fatal injuries, while RTA fatalities are defined to include all traffic-related deaths that occur within 30 days from the accident. Population denominator data were obtained from the published population census reports and the inter census population estimates were obtained based on the enumerated population of 1993, 2003 and 2010 population census in Nigeria. We obtained the data for global comparison from the WHO Reports (2009).

## **VALIDITY OF INSTRUMENT**

To validate the research instrument, the researchers employed the services of two Road Safety officers, two employees and two employers of Federal Medical Center from Plateau, Nigeria for validity. The questionnaire was validated after thorough scrutiny and valuable contributions made duly incorporation.

## **RELIABILITY OF THE INSTRUMENT**

To estimate the reliability of the instrument employed for data collection, the instrument was administered twice to town planning officers, medical doctors, environmental officers, employees and employers of labours numbering twenty from Plateau. The second administration of the instrument was two weeks after the first exercise and the resulting scores were correlated using Pearson Product Moment Correlation approach. This yielded the co-efficient  $Pf r = 0.82$ . This score indicates that the instrument is very reliable.

## **STUDY INSTRUMENT**

We conducted the study in Plateau State, Nigeria. Selection of sample respondents located in residential (households) and institutional (Health) facilities were drawn for the study using cluster sampling. Questionnaires and in-depth interview were conducted to retrieve information from the households in the cluster and respondents in selected Health institutions were interviewed. We administered 399 questionnaires, out of this, 367 was analysed giving a response rate of 92%. For more in-depth understanding of the social reality of population growth and its impact on the health system in Plateau metropolis, 15 in-depth interviews (IDIs) were conducted among the Management and staff of some selected health institutions, environmental officers, town planning officers, employers and employees of labors using simple random sampling. The questionnaire was titled “Effect of Urbanization on public health system (EUPHS).” The questionnaire has two sections. Section “A” demands information on the effect of urbanization on the public system and section “B” contains the likely measures to addressing such negative effects. The instrument is in the form of like five point rating scale. The response options have the values of 5, 4, 3, 2, and 1, respectively.

## **STUDY AREA AND POPULATION**

The study focused on people living and working in Plateau State. The present Plateau state is in Nigeria’s middle belt and shares boundaries with Nassarawa, Kaduna and Bauchi. Created in 1976, it has an area of 26,899 square kilometers. The state has an estimated population of about three million people. It is located between latitude  $80^{\circ}23'N$  and longitude  $80^{\circ}32'N$  and  $100^{\circ}38'E$ . Plateau was one of the first British settlements in the northern part of Nigeria, and it rapidly developed in the 1970s as a result of the European economic activities and later, political activities, especially at the turn of the century. The town started as a cosmopolitan settlement that attracted people from various parts of what is now Nigeria, Sierra Leone, and Europe (Mohammed, 1984). The significance of the town is not only due to its geographical location as the confluence of Rivers Niger and Benue, but also to the historical fact that it was the first

colonial administration capital of Northern Nigeria with rich tourist attractions. Today, Plateau with a Capital city of Jos has a population of about 3,378,093 according to the 2006 national census with an annual growth rate of 2.6%. Plateau state comprises seventeen Local Government Areas (LGAs) in three Senatorial Districts. The major occupations of people are mining, farming, fishing and trading.

## **LIMITATIONS OF THE STUDY**

On primary data, despite the efforts to build in checks and balances in the areas of questionnaire validity and reliability, spread of respondents, and effective coverage of the geographical area of study, we still advice that the following should be taken with caution:

- (i) The use of field assistant could have introduced different levels of interviewer bias.
- (ii) The problems of using a sample to represent a population should not be discounted
- (iii) Respondents' bias may also have interfered with the data generated and subsequently the findings of the study

For our secondary data, we relied on documents and data from government agencies not reputed to be the best in record gathering and storage. Therefore, the limitation of our study will come from the reliability and accuracy of the data and hence information from these sources.

## **PRESENTATION AND ANALYSIS OF RESULTS**

### **RESULTS**

#### *LEVELS AND TRENDS OF AUTOMOBILES USAGE IN PLATEAU*

Table 1 shows the growth of population and automobiles in Plateau State during the 7-year study period 2006 - 2013. It is observable that there has been massive increase in the number of automobiles compared to population increase during the period 2006 to 2013. Between 2006 and 2013, the population of Plateau increased by 21.6%, with the mean annual increase by about 2.0%. On the other hand, the automobile fleet in the country increased by 52.4%, with a mean annual increase by 4.3% between 2006 and 2013. At the same period, the new registration of automobile increased by 161%, with a mean annual increase by 10%. The most remarkable increase in new registration of automobiles occurred during 2006 - 2013 period. During this period, the number of new registration jumped to five-digit number. For example, the number of vehicles in 2006 was 548,908, and 80,762 vehicles were added during 2007, taking the total at

the end of the year to 629,670. After 2008, new registration shows gradual decrease. On average, more than 85,000 new vehicles were registered annually in Plateau between the years 2006 and 2013 (Table 1).

**Table 1 Growth of population and vehicle in Plateau state: 2006 – 2013**

Year	Population in '000	No. of registered vehicles	No. of new registered vehicles	Annual growth rate in registered vehicles (%)	Annual growth rate in new registered vehicles (%)	No. of vehicle per 1000 population
2006	2233	495914	48740			244
2007	2268	520926	42978	5.04	-11.82	249
2008	2304	560302	39376	7.56	-8.38	260
2009	2341	444500	42561	-20.67	8.09	208
2010	2399	468412	57130	5.38	34.23	219
2011	2459	500385	73421	6.83	28.52	233
2012	2521	548908	104891	9.70	42.86	259
2013	2584	629670	136516	14.71	30.15	297
% change 2006 – 2013	15.72	26.97	180.09			21.72
Average for the period 2006 - 2013	2354	521,127	68,202	4.08	17.66	246

Source: Global status report on road safety (WHO, 2013)

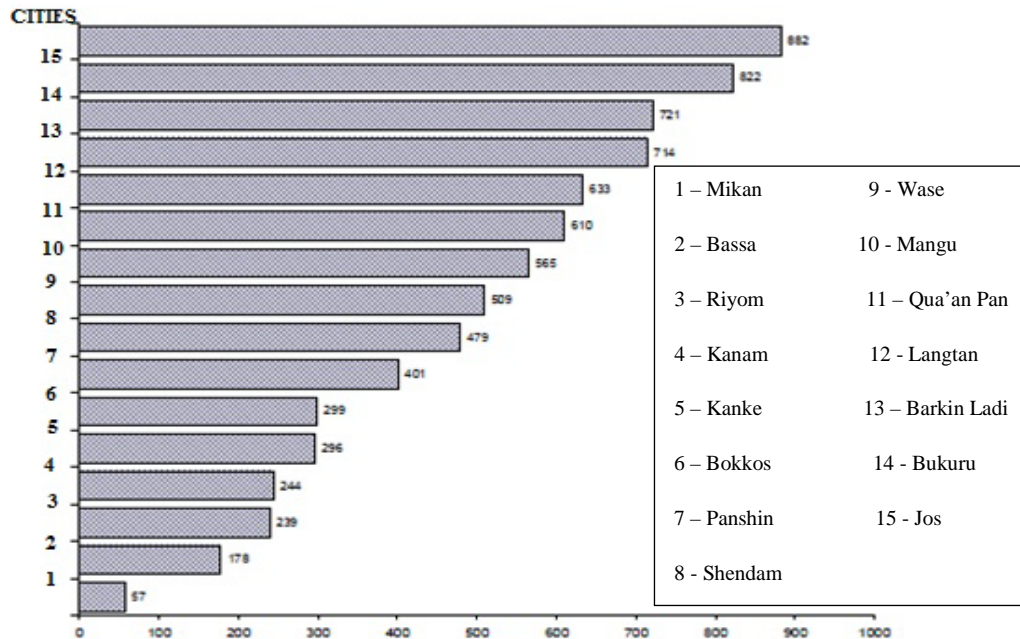
2005  
2006  
2007  
2008  
2009  
2010

Motorization level, as measured by the number of vehicle per 1000 population, shows that on average there are 246 vehicles per 1000 population in Plateau. The 2010 population census in Plateau recorded 551,058 households in Plateau State. Thus, there are approximately 0.45 vehicles per household in Plateau State.

Over all, motorization shows increasing trends in Plateau. Between 2006 and 2013, motorization level increased by 27%.

Figure 1 presents a comparative picture of the level of motorization (number of vehicle per 1000 population) in some selected high and middle-income cities in Plateau in 2013. The information were obtained from the 2013 WHO’s global status report on road safety (WHO, 2013).

Figure 3: Level of motorization (number of vehicle per 1000 population) in some selected high and middle-income cities in Plateau state in 2013



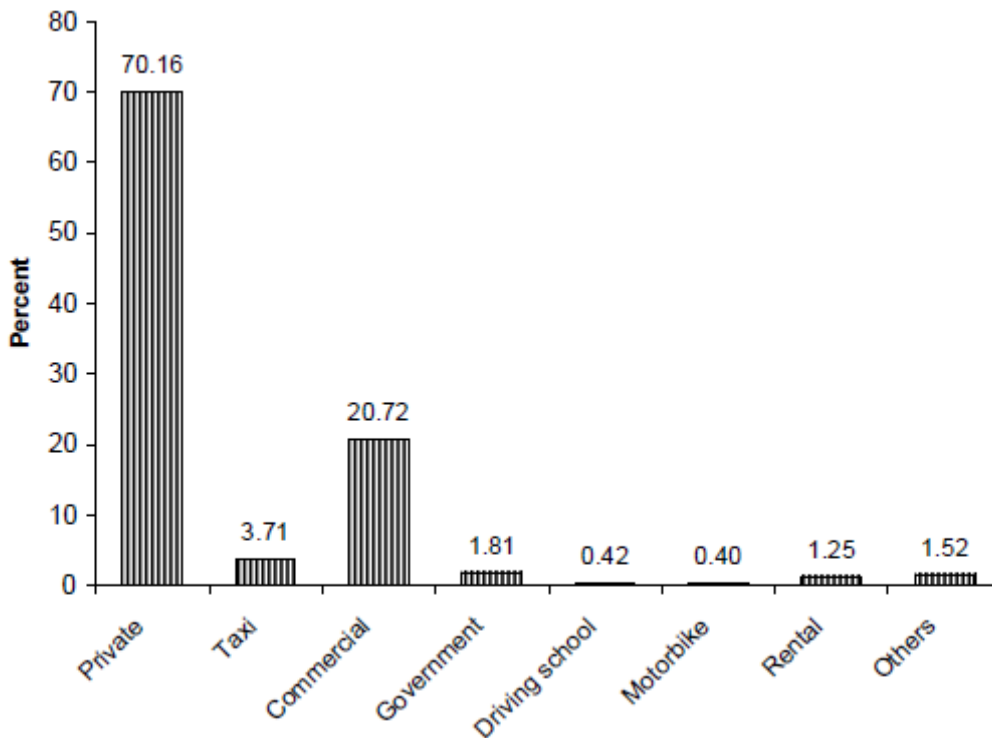
No. of vehicle per 1000 population

Source: Global status report on road safety (WHO, 2013)

With the absence of a railway network or waterways in Plateau, roads remain the primary means for transporting goods and people within the country. There is no public or private bus service within the city or suburban area. However, there are limited intercity bus services, run by a single agency called “Plateau National Transport Company” (PNTC). Shared private taxi services are also available within the city and town areas. Thus, private car and Taxi service are the major modes of personal transport in Plateau. As a result, the most of the registered vehicle in Plateau are private car which numbers have increased tremendously in recent time.

Figure 4 shows the percentage distribution of registered vehicles by types of registration in 2013. The data indicate that private car represents the major share of the registered vehicles, as 70% of the registered vehicles are private cars, followed by commercially used vehicles (21%), Taxi (4%), government use (2%), rental (1.3%) and others (each 1.7%). The ratio of number of private cars and the number of households indicates that there is almost one private car per household in Plateau State (0.96:1).

Figure 4: Percentage distribution of registered vehicles by types of registration



Source: FRSC, 2013

Figure 4 shows the trends in the number of registered vehicles by types of license for the 7-year period starting from 2006 to 2013. During this period, the number of registered vehicles increased, on the average, by 4.3% per annum. This increase is mainly due to increase in private cars and commercially used cars. Private cars are increasing annually, on the average, by 7%, while commercially used cars are increasing by 2.7% per annum. On the other hand, the number of Taxi, government owns vehicles and other types of vehicles remain almost same over the period. The possession of private cars shows steady increase over the period. The growth rate was highest during 2007 - 2008 (15%). The rate of possession of private car per 1000 population increased from 126 in 2006 to 195 in 2013. Globally, Plateau's rank is 52 in terms of car possession per 1000 population, with highest in Nigeria (765 cars 1000 population) (WHO, 2013).

#### *Levels and Trends in Road Traffic Accidents (RTAs) in Plateau*

According to the 2000 National Health Survey in Plateau (Al Riyami et al., 2000), conducted by the Ministry of Health, road traffic work is the number one cause of accident and injury in Plateau State accounting for 61 % of the total accident (Table 2). Other important causes of accident are accidental fall (22 %), burns (4.8%), bullet accident (1.8%) and food poisoning

(1.2%). Males are 1.5 times more likely to experience injuries than female, while the rate of accidental fall, burns, and food poisoning are higher among females.

**Table 2: Percent distribution of accident and injury by causes according to sex, Plateau 2013**

Cause of accident/injury	Male	Female	Total
Road traffic accident (RTA)	68.1	42.6	60.8
Accidental fall	16.8	36.2	22.3
Burns	3.4	8.5	4.8
Food poisoning	0.8	2.1	1.2
Sharp and mechanical tools	0.8	2.1	1.2
Fire bullets accident	2.5	-	1.8
Electrical shocks	0.8	-	0.6
Swallowing chemical/drug	0.8	-	0.6
Other	5.9	8.5	6.6
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Source: Plateau National Health Survey, 2000

Volume 1, p136, Al-Riyami *et al*, (2000)

Data in Table 3 shows the levels and trends of RTA in Plateau during the first decade of the new millennium (2000-2009), according to the PPD data source. In absolute term there were 7,253 traffic accidents in 2009 against 2.7 million population and 755, 937 registered vehicles, indicating a rate of 2.67 accident per 1000 population or 9.59 accident per 1000 registered vehicles.



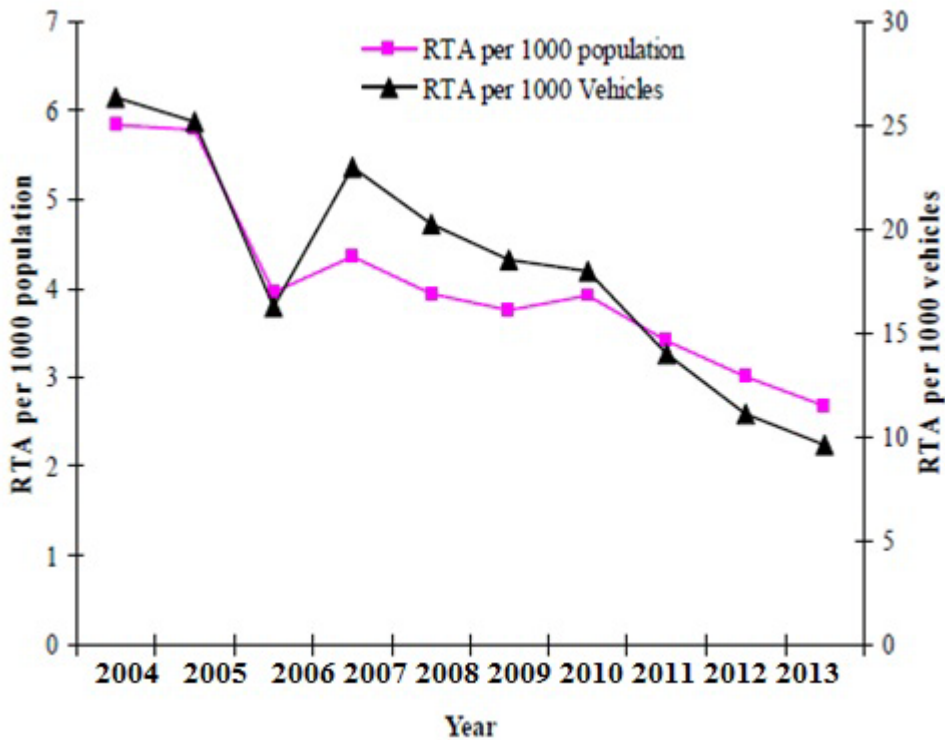
**Table 3: Level of RTA per 1000 population and vehicles, 2006-2013**

Year	Number of RTA	RTA per 1000 population	RTA per 1000 vehicles
2004	13040	5.84	26.29
2005	13101	5.78	25.15
2006	9107	3.95	16.25
2007	10197	4.36	22.94
2008	9460	3.94	20.20
2009	9247	3.76	18.48
2010	9869	3.92	17.98
2011	8816	3.41	14.00
2012	7982	3.01	11.08
2013	7253	2.67	9.59
% change during 2006 - 2013	-44.38	-54.28	-63.51
Average growth per annum	-5.7%	-7.52%	-9.59%

As we may have seen from Table 3 and Figure 4 that there is an appreciable decline in RTA rates in Plateau. The number of accidents fell down from 13,040 cases in 2006 to 7,253 in 2013, a dPP of 44% over the period 2006-2013 or a decline of 5.7% per annum. During the same period, the overall decrease in accident rate was 54% for per 1000 population and 63.5% for per 1000 vehicles. The corresponding figures for average annual decreases are 7.5% and 9.6%, respectively. This fall in accident has occurred despite the fact that the number of vehicles on the roads and new driving licenses as well as the population increased over the period. This may be a consequence of the traffic safety efforts of PP by imposing stringent conditions for issuing license and road safety information, education and communication (IEC) programmes through mass media.

## **TYPES OF RTAS IN PLATEAU**

Figure 4 shows the distribution of RTA in Plateau in 2013 by the types and severity. The types of RTA were categorized as collusion with other vehicles, collusion with fixed objects, overturn and run over pedestrians. It can be seen that about 70% of the accidents are due to collision: 48% with other vehicles and 22% with fixed objects. Sixteen percent of the accidents were due to overturn and 14% were due to run over the pedestrians. The distribution of RTA by the type of severity indicate that nearly two third (64%) of the RTA caused injury, while 10.5% caused fatality and the rest 26% were with minor or no causality (Table 4).



**Figure 4: Trends in rate of RTA per 1000 population and per 1000 registered vehicles in Plateau, 2006-2013**

## SOCIO-DEMOGRAPHIC PROFILE OF THE VICTIMS

Total of 1238 accident cases were included in the study. Majority of the victims (984 cases) were in the younger age group of 15-50 years (79.47%). Four hundred and thirty three (433) cases (34.97%) was seen in the age group of 25-39 years. Children less than 14 yrs and elderly (>60yrs of age) made up 176 cases (14.21%). One thousand and ninety nine (88.77%) of the victims were males with 139 (11.23%) of them were females.

Majority of the victims were Christians 998 (80.62%) with Muslims and Pagans forming 18.98% and 0.40% respectively. Of the 1238 victims interviewed 925 (74.72%) were married accounting for 74.72% of the victims, while 313 (25.28%) were not married (for analysis purpose even victims less than marriageable age were included in the not married group).

Majority of the victims had had a primary level of education 31.02%, while 20.27% of the victims were illiterates. Only 14.46% of the victims had a degree only one victim had a professional degree, while 27.95% of the victims had a secondary education. Twenty two point six two per cent (22.62%) of the victims were unskilled labourers like manual labourers and farmers and 25.53% of the victims were semi skilled, which included drivers (taxi, auto, maxi cab). All the female victims were homemakers, accounting for 6.70% of the injuries.

## **PATTERN OF INJURIES**

Out of the total 1238 (100%) RTA cases, 118(9.53%) had injuries of upper limb, 297 (23.99%) had injury of lower limb, 495 (39.98%) had injury on the abdomen and 328 (26.49%) had multiple injuries at more than one site. (Table 5)

**Table 5: Pattern of injuries**

<b>Part involved in RTI</b>	<b>Number of victims(%)</b>
Upper limb	118 (9.53)
Lower limb	297 (23.99)
Abdominal	495 (39.98)
Multiple	328 (26.49)
Total(%)	1238 (100)
<b>Severity of RTI/TIS</b>	
Mild	688 (55.58)
Moderate	389 (31.42)
Severe	161 (13)
Total (%)	1238 (100)
<b>VULNERABLE ROAD USERS</b>	
Pedestrian	166 (13.41)
Cyclist	112 (9.05)
Motorized two-wheeler	514 (41.51)
3 wheeler	112 (9.05)

LMV	240 (19.39)
HMV	68 (5.49)
Tractor	13 (1.05)
Others	13 (1.05)
Total	1238 (100)

#### *SEVERITY OF INJURIES*

The severity of injuries suffered by the victims was graded according to the “Trauma Index”<sup>4</sup>. According to this index injuries are classified as mild injuries (0-7), moderate (8-18) and severe injuries (more than 18). So in this study it was observed that 688 (55.58%) had a score of 0-7 and categorized under minor injuries, 389 (31.42%) had a score of 8-18 and categorized under moderate injuries and 161 (13%) had > 18 injuries and put under the category of severe injuries. (Table-5)

#### *AILMENT AT THE TIME OF INJURY*

Among the victims 223 (18.01%) of them gave a history of having consumed alcohol within 6 hours before the RTI, whereas 1015 (81.99%) of them had not consumed. children were grouped under ‘NO’ for simplification, however, no information was collected as to the type or quantity of alcohol consumed.

*Type of vehicle involved* Majority of the victims were two wheeler occupants (riders or pillions) and occupants of Light Motor vehicles 41.51% and 19.39% respectively. Pedestrians became victims in 13.41% of cases. Cyclists and occupants of 3 wheelers made up 9.05% each. (Table-5)

#### *DAYS OF OCCURRENCE OF INJURY:*

In the present study, 670 (54.12%) accident cases were reported on weekdays i.e. Monday-Fridays and remaining 568 (45.88%) on weekends i.e. Saturdays and Sundays.

*Time of occurrence of injury:* Four hundred and ninety seven (40.15%) of the RTIs took place between 6pm - 12midnight, followed by 357 (28.84%) between 6am-12 noon. 114 cases with least RTIs occurred between 12.01am – 6 am (9.21%). (Table-6).

**Table 6: Antecedent Factors**

<b>Time of Injury</b>	<b>Percentage</b>
Morning(6am-12 noon)	357 (28.84)
Afternoon(12.1pm -6pm)	270 (21.80)
Evening(6.1pm-12midnight)	497 (40.15)
Night(12.1am -6 am)	114 (9.21)
Total	1238 (100)
<b>What hit you?</b>	
Unknown	32 (2.58)
Cycle	20 (1.62)
Motorized two-wheeler	260 (21.0)
Three wheeler	130 (10.50)
LMV ( car, jeep, van)	322 (26.01)
HMV(bus/truck)	160 (12.92)
Tractor	44 (3.55)
Other vehicle	25 (2.02)
Self fall	89 (7.19)
Animal	36 (2.91)
Trees	111 (8.97)
Electric pole	09 (0.73)
Total	1238 (100)

Type of collision	
Head on	204 (16.48)
Sideways	650 (52.50)
From behind	173 (13.98)
NA	211 (17.04)
Total	100

#### *Place of injury*

48% of the RTIs occurred outside the city, whereas 32% of the injuries occurred inside the city. 20% of the RTIs took place on the outskirts of Ambala.

#### *Where injury occurred?*

Majority of the RTIs took place on main roads 73.8%, followed by near junctions, 14.2% and cross roads 12.0%.

#### *What hit you?*

The vehicles involved in injuring the victims were LMVs most of the times 322 (26.01%) followed by motorized two wheelers 21.0% of the times. HMTV hit the victims in 12.92% of the cases. 18 (7.19%) victims said that they sustained injury by self-fall, followed by tractor hitting the victim in 3.55% of the time.

*Type of collision* Majority of the times it was a sideways collision; 52.50% of the times, followed by head on collision; 16.48% of the times. Only in 13.98% of the times, the victims were hit from behind. (Table-6).

#### *Local environmental condition of the place of injury*

Majority of the victims; 1045 (84.41%) responded that the road on which the RTI took place was tarred, while 149 (12.04%) of the victims responded that the road was rough and 48 (3.88%) of them responded that the road was wet at the time of injury. Eight hundred and twenty two (66.2%) of the victims said that the lighting was adequate at the time of occurrence RTI (Injuries

that took place during day time were included under 'adequate' lighting for analysis). Three hundred and forty (27.46%) of the victims said that there was no lighting at the site of injury occurrence and 77 (6.22%) of them said that the lighting was inadequate.

*Medical aid at the site of injury*

Only 4.12% of the victims mentioned that there was medical aid available at the site of injury (within 500 meters from the site of injury).

*How injury occurred?*

Majority of the victims were injured while there crossing a road 875 (70.68%), 231 (18.66%) of them were injured while they were walking or riding by the side of the road (footpath). One hundred and thirty one(10.58%) of them were injured while they were boarding or alighting a vehicle.

*Use of helmets and seat belts:*

Among the 545 two-wheeler users (riders and pillion) only 158 (28.99%) of them wore a helmet when they were injured, whereas 387 (71.01%) of them did not wear a helmet. 693 (55.98%) of them were other road users.

Between the 492 HMT and LMV users only 66 (13.42%) of them used seat belt. Rest of them did not use a seat belt.

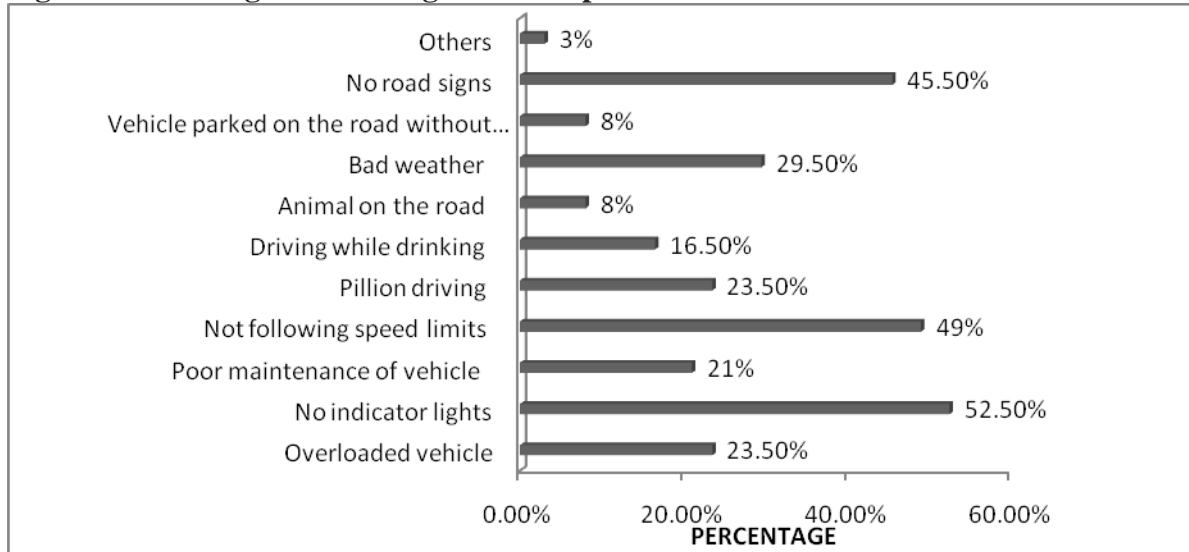
*Presence of driving license among drivers:*

Two hundred and one (16.24%) of drivers did not have valid driving license at the time of RTI occurrence.

*Cause of event:*

Causes responsible for these road traffic accidents are shown in figure-5 . Not using indicator lights, not following speed limits, no proper road signs were most common causes responsible for road traffic accidents.

**Figure-5: Bar diagram showing causes responsible for these road traffic accidents**



### POST-INJURY FACTORS

#### *Transportation used for reaching Medical Centre*

The victims were brought to the hospital by auto 390(31.50%) of the instances, followed by private vehicle 314 (25.36%). The police used their vehicles to bring 220 (17.77%) of the victims to the hospital. One hundred and three (8.32%) of the victims were transported using a taxi, whereas 61(4.93%) victims reached the hospital by bus/minibus. Ambulances brought the victims to the hospital 150 (12.12%) of the instances.

## DISCUSSION, SUMMARY, CONCLUSION, RECOMMENDATIONS

### DISCUSSION

From the results of the study, it is clear that the incidences of the Road Traffic Accidents (RTA) are on the increase and characterized by seasonal factors as can be seen from the high values of the seasonal indices in Table 5 for the months of January, February, May, June, October, November and December. This study is in line with previous studies in developing countries which suggest that RTA has been on the increase. It also agrees with the results of the study by Eke et al. (2000) that there are seasonal variations in RTA cases. However, it is at variance with it with respect to the period where it occurs most. Eke et al. (2000) found that RTAs occur most during the rainy season (June, July and August) while ours are in the first and second quarters precisely in the months of January and December which are dry season period. Considering the fact that heavy road traffics lead to more RTAs, the difference may be explained by the following facts;



- Universities and Polytechnics close for Christmas holidays and students go home in the month of December and to return in the month of January on re-opening
- The heavy traffic on all Nigerian roads of which the Jos road is no exemption as a result of the Christmas festival spanning through 1st and 2nd quarters (1st quarter-January, February and March; 2nd quarter-October, November and December) of the year in Igbo land, Southeastern Nigeria
- The months of May and June are very rainy periods and RTA is expected to occur more during this period as a result of bad road and reduced visibility whenever it is raining

It also agrees with Ezenwa (1986) and Odera (1998) that reckless driving is a lead cause of RTA in Nigeria.

The reason for the high level of RTA involving Motorcycles (McMc and McV) is not far fetched. As a result of the high level of unemployment in Nigeria, a lot of the unemployed youths took to Motor-cycle-riding popularly known in Nigeria as Okada- riding (Okada-riding is the use of Motorcycle as a means of transpoRTAtion) as a means of livelihood without being well grounded in good-road-using capabilities such as ability to read signs and obey traffic rules and regulations. No wonder the Plateau State Government and most other State Governments have banned Okada riding in most of the major cities.

It is not uncommon that reckless driving, a human factor (AUSTROADS, 1994) caused a greater percentage of the RTA. This may be attributed to the fact that many of the students who ply the road with their parents or relatives vehicles are bound to be reckless in driving with a view of impressing their fellow students and most of them are also inexperienced in driving. This factor also partly explained why larger numbers of vehicles, involved in RTAs along the road are private cars. More so, most of the staff of the Institutions live in Jos, the capital city of Imo State and are frequent users of the road with their private vehicles back and forth.

Mechanical fault and road defects (MRD) which is under Vehicle and road and environments factors respectively are also significant cause of RTA. This is in agreement with AUSTROADS (1994) that says that one or more of human, Vehicle and road and environment factors must be involved for RTA to occur. This is attributable to the fact that the conditions of most Nigerian roads are generally poor and majority of the vehicles are fairly used, imported from Europe and Asia (These imported used cars are locally called Belgium) and majority of them have been used for over 15 years in Nigeria.

On the part of inexperience which is a human factor, there are too many I-Can-Drive (ICD) drivers (ICD means just the ability to move vehicles without knowing the rules and regulations guiding road use) using the road of which a good number of the students belong to this class.

On the part of Mini-buses and Taxis, being significantly involved in RTAs is because they are the major means of transport for the students back and forth. This finding is in agreements with

Eke *et al* (2000), Thanni, and Kehinde (2006). While the former have observed that cars and buses are commonly involved in the casualties of RTAs in Nigeria followed by motorcycles and Lorries, the latter found that minibuses, the popular mode of commercial transportation was involved in 63.9% of RTAs, while cars were involved in 14.8% of cases. Motorcycles and pedal bicycles were involved in 6.2 and 0.6% of cases, respectively while Lorries and trailers were involved in 1.1% of cases each.

**Based on the results of the study, the following preventive measures are suggested:**

- Training of drivers should be made a very serious affair and must be properly supervised by qualified personnel and traffic road control agents
- Drivers' licenses only issued to those who have passed through a series of Driver and Traffic Safety Tests (DTST)
- Motor vehicles are inspected for roadworthiness before registration. Inspection checklist should include the number of years the vehicle has been used, rear and side view mirrors, windscreen wipers, speedometer, brakes and brake lights, trafficators, reverse and parking lights and so on (Nwokoro, 2005)
- The FRSC, VIO and other Traffic wardens should step up to their responsibilities and should go extra miles during the traffic heavy periods (festive and rainy periods) of high RTA level
- Driver and Traffic Safety Education (DTSE) should be offered as a pre-requisite to the issuance of driving licenses. DTSE should also be offered in Primary and Post-primary schools and Tertiary Institutions.

## **CONCLUSIONS**

The fundamental finds of this study are that RTAs in Plateau State, Nigeria are characterized by an upward trend and seasonal effect of an appreciable magnitude. Crashes-Motorcycles-Motorcycle (McMc), Motorcycles-Vehicle (McV) and Vehicle-Vehicle (VV) are the lead types and accounted for the greater number of deaths. Reckless driving, inexperience and mechanical fault and bad roads are the major causes while Private cars, Minibuses and Taxis were predominantly involved in RTA.

The increasing toll of RTA in Plateau State, Nigeria and consequent deaths and injuries constitute a public health problems that requires serious attention since these deaths and injuries may be preventable.

Though the data used in the study were collected on different road, however the finds provides an insight into the trend and characteristics of RTAs in Nigeria.

Road traffic accident in Nigeria has not received the attention warranted considering the magnitude of the problem. There is need to view road traffic accident as an issue that needs urgent attention aimed at reducing the health, social and economic impacts. 'Safe road' in Nigeria is more of changing our driving behaviour than just blaming the government alone and advocating for good road infrastructure.

Factors that are most responsible for accident on road transportation network have been examined. The study also considered some of the preventive measures needed to reduce the present unacceptable high tallies of accidents on the Nigerian highways. The vehicle, the driver, the road and its environment are among the factors that increasingly cause road accidents in Nigeria. Measures to reduce the rate of road traffic accidents have also been highlighted.

Finally, it is our utmost belief that the preventive measures proffered in this paper will yield spectacular results in Plateau State and Nigeria in general if properly and honestly adopted.

## **RECOMMENDATIONS**

1. Privately owned mass transit operators should, as a matter of high priority, introduce and operate comprehensive maintenance and repair programme for their vehicles.
2. The Operators (driver) should be properly trained and then retrained.
3. Transit organization should operate adequate and comprehensive welfare scheme for their employees in general and for the drivers in particular, since the lives of all passengers are in their hands.
4. As a matter of necessity, some of the latest scientific techniques for determining extremely productive schedules for the drivers should now be utilized as the organizations in question have technically out-grown the use of trial and error schemes for addressing such problems.
5. There is need for the various governments to pay sufficient attention to the maintenance of all roads in the federation.
6. Furthermore, the provision of adequate drainage system is one that calls for urgent attention.

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