

# Empirical Analysis and Management of Motor Cycle Road Traffic Accidents: A Case Study of Ekiti State Nigeria

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**Abstract:** *The study examines the empirical analysis and management of motorcycle road traffic accident in Ekiti State of Nigeria. Data were obtained from federal road safety commission (FRSC) Ekiti State command office in between year 2010 and 2015. Regression Analysis was adopted in analyzing the data obtained. This was done in order to establish the trend of accident cases in Ekiti State. Based on the findings of the study, it was revealed that year 2013 has the highest proportion number of accident cases (0.24) follow by year 2012 with (0.23) proportion in Ekiti State under the years of review. It was concluded that the trend of all three cases of accidents are generally reducing in the study area*

**Keywords:** Motorcycle, Ekiti, road accident, causality, trend and federal road safety commission (FRSC)

## 1. Introduction

Motorcycle is one of the major means of transportation in Nigeria. It can be found in the rural and urban settlement. There has been an increased in the use of motorcycle in Nigeria largely on account of their rising popularity is a form of commercial transport (Oluwadiya et al, 2004). During the last ten years, motorcycle regulations have more than double and, and unfortunately, the number of motorcycle accidents and injuries has increased. The most recent of the statistics show that the number of fatalities attributed to motorcycle traffic accidents is approaching five thousand per years. At present time motorcycles accidents contribute nearly 10% of the traffic accident fatalities while motorcycles are only one or two percent of the vehicles in traffic. In this way, the motorcycle appears to be the most dangerous form of motor vehicle transport. Motorcyclists are about three times more likely than car occupants to be injured in a crash, and 16 times more likely to die (Branes & Knudson, 2001). The inherent nature of motorcycles offers riders and passengers no protection like cars making them potentially dangerous (Ogunlusi & Nathaniel, 2011).

The objective of this study is to:

- 1) Examine the trend of motorcycle road traffic accident occurrence in Ekiti State.
- 2) Considered the management strategy employed in the handling of motorcycle accident in terms of emergencies in Ekiti State, Nigeria.
- 3) Forecasting the future status of motorcycle road traffic accident in Ekiti State, Nigeria.

Several efforts are geared towards encouraging motorcycle riders and their passengers to imbibe the positive culture of constant use of crash helmet (Pius, 2014).

According to Texila American University (TAU, 2014) there are major setback include non-adherence to available motorcycle helmet laws, inability on the part of law enforcement agents to enforce the laws and difficulty in

bringing about behavior change because of non-sustenance of public health campaign. Education is deemed a determinant of knowledge, attitude, and value system of individuals.

## 2. Literature Review on Motorcycle Accident

Akinlade (2000) while looking at the same subject matter, from the public health point of view noted that road traffic accidents have been recognized as important health problems in both developed and developing countries. He observed that road traffic accident have been increasing in developing countries like Nigeria and Tanzania while there has been a reduction in developed countries like Australia (Ogbeide, et al, 1994).

According to Taiwo (2007), most drivers take for granted the ability of their automobile to handle minor road hazardssuch as pit holes or rail road tracks, these minor roads hazard are major problems for motorcycles because these hazards may require sudden changes of lane position and direction. 'Accidents due to motorcycle riding especially in developing countries like Nigeria increase every year due to the fact that the motorcycles do not follow the traffic rules and they in their mentality believe they are 'the king on the road' Federal Road Safety Commission (FRSC, 2007). FRSC(2007) further stated that motorcycle crashes are more likely to occur on certain times especially raining seasons in Nigeria is a season for motorcycle accidents because of the filled pot holes with water and supply surfaces on the road.

FRSC has identified road defects as causal factor of motorcycle accident in Nigeria as a result of the various pit holes and wobbles motions on deformed roads, the motorcyclists lose control of their motorcycles and collision with oncoming vehicles may occur(Ogunmodede et al, 2012). Often factors responsible as identified by FRSC (2007) include brake failure; control of the motorcycles is lost when the brake fails and resulted in an accident. It was noted that the most important aspect of the human factor are

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the age of the motorcyclist, medical fitness of the motorcyclist, alcoholic consumption pattern, fatigue, marital status and educational level (Oladepo and Brieger, 1986, Odero, et al, 1997, Lin et al 2003, Sexton et al, 2004, Elliot, et al, 2007).

### 3. Materials & Methods

#### Ethical Clearance

Ethical clearance was received from Federal Road Safety Corps (FRSC) RS 8.2 Ekiti Sector Command, Ado-Ekiti before the release of data used for the article.

#### Data Collection

Data for the study were collected on yearly basis from Federal Road Safety Corps (FRSC) between year 2010 and year 2015. The data were classified into two types (Fatal, serious and minor) and casualty (killed and injured).

Considering that data is a time sequence data collected at regular interval (yearly), we would adopt the technique of time series analysis in analyzing the data. Descriptive statistics would also be used to summarize the data. Time series analysis is an act analyzing and interpreting the time series data  $X_t, t=1, 2 \dots n$  the data are analyzed in order gain an understanding of the underlying generating mechanism of the process,  $X_t, t \in Z$  (Delurgio, 1998, Priestley, 1981). The emphasis on time series analysis is on model building, the following models are always considered.

- Additive:  $X_t = T_t + S_t + I_t \dots \dots \dots (1)$
- Multiplicative:  $X_t = T_t * S_t * C_t * I_t \dots \dots \dots (2)$

**Table 2: Type of Accident cases by:**

Years	Fatal cases	%	Serious cases	%	Minor cases	%	Total	proportion
2010	5	11.1	21	13.2	2	50	28	0.13
2011	1	2.2	24	15.1	2	50	27	0.12
2012	15	33.3	32	20.1	0	0	47	0.23
2013	7	15.6	49	30.8	0	0	50	0.24
2014	11	24.4	13	8.2	0	0	24	0.12
2015	6	13.3	20	12.6	0	0	26	0.13
Total	45		159		4		208	

Authors Estimates (2016)

The table 2 above shows the trend of motorcycle accident cases recorded by the Federal Road Safety Corps in Ekiti. The figure shows that serious accident cases are more frequency in Ekiti motorcycle accident than other two classified types of accident cases. It was noted that the trend of all three cases of accidents are generally reducing in Ekiti State. The table also revealed that fatal accident started reduced from year 2013 while serious accidents cases was increased started from the year 2010 at year 2014 it reduced it also comes up at year 2015. Also minor cases of accident in ekiti state was at minimum point. The gradual reduction in total number of motorcycle accident in Ekiti might be attributable to the increased in the level of good road network within the state capital and to the success of effective road safety education and campaign embarked upon by government agency like FRSC, Ekiti State Transport Management Agency (EKSTMA) and other non-government organization in the state. Also, from the above table above it was recorded that year 2013 with '0.24'

**Table 1: Motorcycle Road Traffic Accident (MRTA) Statistics in Ekiti 2010-2015**

Year	MRTA				Casualty		
	Fatal	Serious	Minor	Total	Killed	Injured	Total
2010	5	21	2	28	6	43	49
2011	1	24	2	27	2	46	48
2012	15	32	0	47	21	77	98
2013	7	49	0	50	10	96	106
2014	11	13	0	24	13	32	45
2015	6	20	0	26	7	31	38
Total	45	159	4	208	59	325	384
%	21.6	76.4	1.9		15.4	84.6	8

Authors Estimates

Source: Federal Road Safety (FRSC) Ekiti State

Table 1: present a general pattern of Motorcycle Road traffic accident in Ekiti State between 2010 and 2015. A total of two hundred and eight (208) Motorcycle traffic accidents was recorded in Ekiti State within the period under review out of this we have forty five (45) fatal cases of accidents, one hundred and fifty nine (159) serious cases of accidents and four (4) minor cases of . These represent 21.6%, 76.4% and 1.9% respectively.

Also, total of three hundred and eighty four (384) victims were involved in accident within the period of review. 15.4% of the victims lost their precious lives out rightly while 84.6% of them sustain varying degrees of injuries

proportion no of accident that is highest numbers of accident was recorded that particular year.

#### Segmented Regression Line and Forecasting Trend

##### Fatal cases of accident

The segmented regression line making the years under review as the predictor variables ( $X_i$ ) and fatal cases as dependent variables ( $Y_i$ ) is given by  $Y = 4.800 + 0.771 * X$

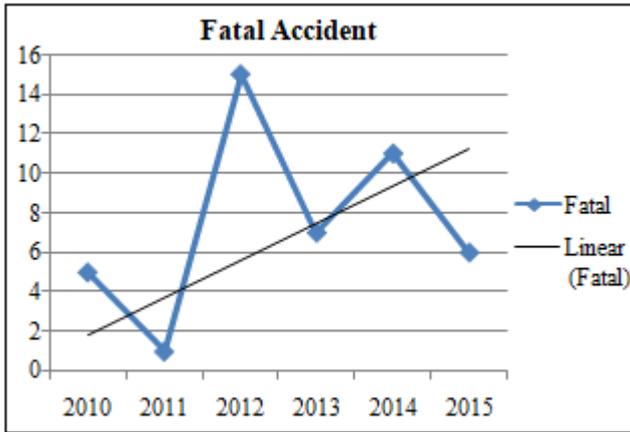


Figure 1

**Serious cases of accident**

The segmented regression line making the years under review as the predictor variables (Xi) and fatal cases as dependent variables (Yi) is given by  $Y = 28.600 - 0.600 * X$

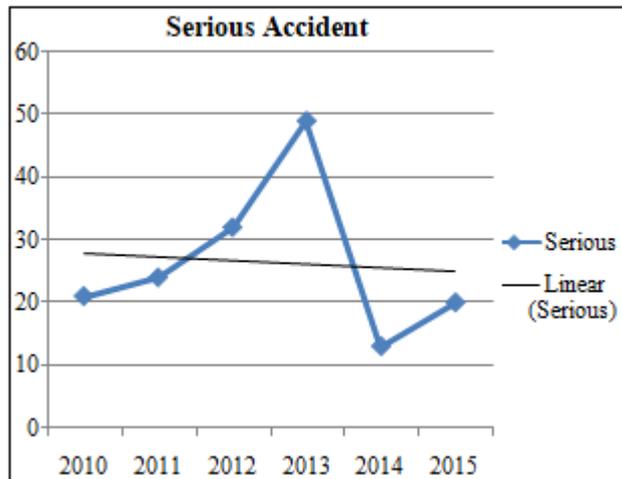


Figure 2

**Minor cases of accident**

The segmented regression line making the years under review as the predictor variables (Xi) and fatal cases as dependent variables (Yi) is given by  $Y = 2.267 - 0.457 * X$

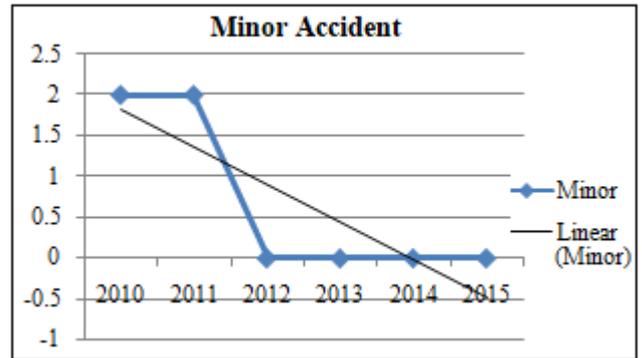


Figure 3

**Causality of Motorcycle Accident in Ekiti State**

**Killed cases**

The segmented regression line making the years under review as the predictor variables (Xi) and fatal cases as dependent variables (Yi) is given by  $Y = 7.133 + 0.771 * X$

**Injured cases**

The segmented regression line making the years under review as the predictor variables (Xi) and fatal cases as dependent variables (Yi) is given by  $Y = 62.467 - 2.371 * X$

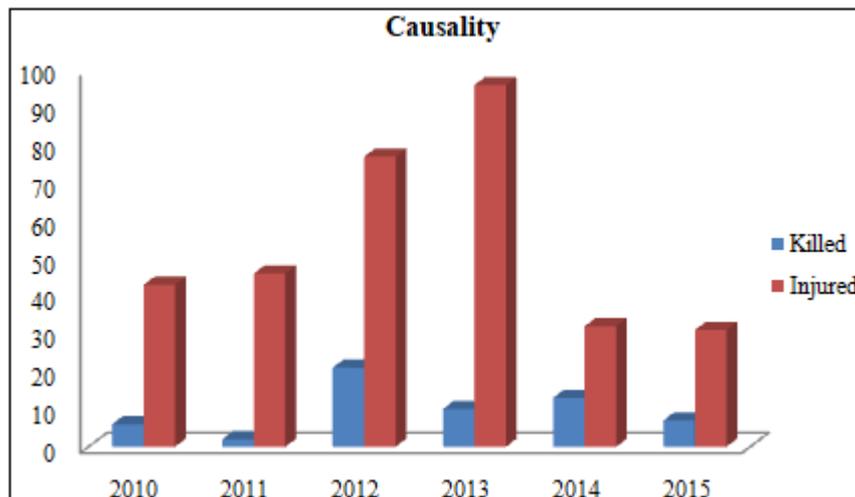


Figure 4

On the other hand figure 4 above shoe the relationship between killed and injured victim involved in the motorcycle accident in ekiti state. The causality of injured is always more than the numbers of killed in the accident from year 2010 to 2015.

**Known Causes of Accidents in Ekiti State**

It has been well known that accident doesn't just occur they are causes. This implies that the occurrence of accident can be attributed to specific factors. Gbadamosi (1994, 2002) have all identified the human factor as the singular most important cause of accident in virtually all locations

around the world. The impact of human factor can be seen in the area of drunkenness, fatigue, emotional instability, wrong judgment, over speeding, careless overtaking, underage driving among others. Aside these human factors others can be attributed to:

- Environmental factors
- Vehicle contribution factors
- Poor transport situation and
- Institution factors

#### **Management of Motorcycle Accident in Ekiti State**

The World Health Organization underscored the likelihood of road traffic deaths becoming the 5<sup>th</sup> leading cause of death by 2030 unless something drastic is done. It is obvious that road accident cannot be totally eradicated in as much as movement takes place. Government of Ekiti State has come to terms with the establishment of specific strategies at managing traffic accident in the state. Among these include:

- 1) Establishment of Ekiti State Transport Management Agency (EKTSMA)
- 2) Adequate equipment in Hospital
- 3) Strict enforcement of traffic laws in the state.

#### **4. Conclusion**

In the paper, we have studied the empirical analysis and management of motor cycle road traffic accidents total cases reported of accident and the number of deaths resulted from accident in Ekiti State. Linear regression analysis model was used to analyze the data set. The model for road accident in Ekiti State was found to be  $Y = 4.800 + 0.771 * X$ . Motorcycle accident in Ekiti State is expected to maintain a steady increase from 2010 to 2015.

Based on the findings of this study, it was concluded that human factor is the major factor responsible for the motorcycle traffic crashed in Ekiti State

#### **5. Recommendations**

Based on the findings of this study, the following recommendations are suggested;

- Availability of road safety awareness using different media of communication as a form of National orientation.
- Road situation in Ekiti State should be improved as bad roads need to be repaired.
- There should be strict penalties against anybody caught riding motorcycle under the influence of alcoholic drinks and alcoholic joints should be closed by the government.
- Helmet must be made compulsory for motorcycle riders to prevent head injuries, if accident occurs.
- Lastly, Ekiti State government should provide employment opportunities for our teeming youth as this will go a long way in the reduction of number of youth who as a result of unemployment took to motorcycle riding business.

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