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## TREND ANALYSIS OF REPORTED NUMBER OF INJURED FROM ROAD TRAFFIC CRASHES IN LAGOS STATE, SOUTH WESTERN NIGERIA

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### Abstract

The study examined a trend analysis of reported number of injured from road traffic crashes in Lagos State. The trend analysis and time series approach were used to compare the reported number of wounded in Lagos State's 20 local government areas over a 53-year period (1970–2023). The trend of injured from road traffic accidents revealed that the phenomenon is on the increase in other words, the gradient of injured occurrence from RTA's is on the increase in Lagos State. The result from the multiple regression analysis showed that the  $R^2$  value was 0.82. These implies that the proportion of variation in the dependent variable explained by the independent variable was 82%. The F-ratio of 15.64 was higher than the table value of 2.91 at 0.05 level of confidence, indicating that at least one of the independent variables had a significant influence on the dependent variable. Recommendations for lowering the incidence of injuries from traffic accidents in Lagos State, Nigeria, were made in light of the findings.

**Keywords:** *Injury; road traffic crashes; trends; analysis; Lagos State*

### Introduction

Today, one of the highest challenges in the world, especially in developing countries, is traffic accidents and their consequences. Numerous factors and circumstances contribute to traffic accidents. While some of the data are specific to a particular region, others describe accidents (Shahsavari et al., 2022; Nantulya and Reich, 2002, Vinish et al. 2023, Ahmed et al. 2023) that are caused by environmental factors, road characteristics, and driver behaviour (Onate-Vega et al., 2020; Wu and Xu, 2018; Ellison et al., 2013; Pakgothar et al., 2011; Atubi, 2012j; Atubi, 2022a, Atubi, 2022c and Mohammed-Azami et al. 2024).

The injuries caused by road traffic accidents (RTA's) become a major public health problem worldwide and a major cause of morbidity and mortality with temporary or permanent disability (Atubi, 2020b, University of Oxford, 2022, Dataphyte, 2022, Wada et al. 2023, and AbdRahman et al. 2023). Road traffic accidents have become one of the most important disadvantageous impacts of man's interrelationship with technology (WHO, 2002). There is an epidemic of road traffic accidents in Nigeria that is second only to infectious disease as a medical problem. Traffic accidents represent the leading cause of death and disability in the young (16 to 36 years old). It is an epidemic as serious as plague or small pox was to earlier generations.

With a total road network of 194,394km, Sub-Saharan Africa's largest road network is found in Nigeria. Most of these roads were constructed years ago when there were fewer cars on the road and other forms of transportation, including railroads, were accessible. However, road building has not increased at a rate that is commensurate with the increase in automotive traffic. As motorisation has increased, the burden on roads has increased due to the demise of rail transportation and the use of waterways as alternate routes of transportation. Road breakdowns, increased insecurity, particularly on rail transport, and an increase in traffic accidents are the results (Atubi, 2021a; Atubi, 2021d, and Atubi, 2022e).

In the third quarter of 2023 (Q3 2023), Nigeria recorded a distressing total of 2,187 road accidents (FRSC, 2023, National Bureau of Statistics, 2023). Road accident incidences in all 36 states of the Federation, including Abuja, the Federal capital territory, were thoroughly described in the NBS study along with the underlying causes of these incidents. Lagos State had 110 traffic accidents in the third quarter of 2023, more than any other state in Nigeria during that time. The most frequent cause of accidents in Lagos was speeding, which resulted in 56 instances, followed by mechanical failures (12 cases) and route violations (10 cases). Inappropriate overtaking, brake failures, and tyre bursts were additional causes (Obiowu, 2023).

Between January and March 2022, road traffic crashes claimed 1,834 lives in Nigeria, with Lagos State accounting for the highest number of fatalities among the federation states. Of this number, 77.8% of the adults were male and 15.2% were female. Compared to male children, more female children were slain (Atubi, 2023, Ramphul et al. 2024). In contrast, 1,652 people died in traffic accidents between October and December 2021, and 1,834 people died between January and March 2022. This means that the number of fatalities from traffic accidents increased by 11.02% in the next quarter. Additionally, more people died in traffic accidents during the January–March 2022 period than during any other quarter of 2021. Approximately 10,200 people were injured and 1,700 people died as a result of the more than 11,800 traffic-related incidents that took place in Nigeria in the fourth quarter of 2021 (Nigeria Customs, 2022).

Traffic situation in Lagos State is particularly chaotic; Lagos state is the business nerve centre of Nigeria. Among other contributing factors, human misuse, poor route management, inadequate on-street parking, traffic congestion, delays, and accidents are some of the reasons why Lagos State's traffic situation is so bad. Metropolitan Lagos can be considered one of Nigeria's main traffic attractors (Atubi, 2014; 2013b and 2013c).

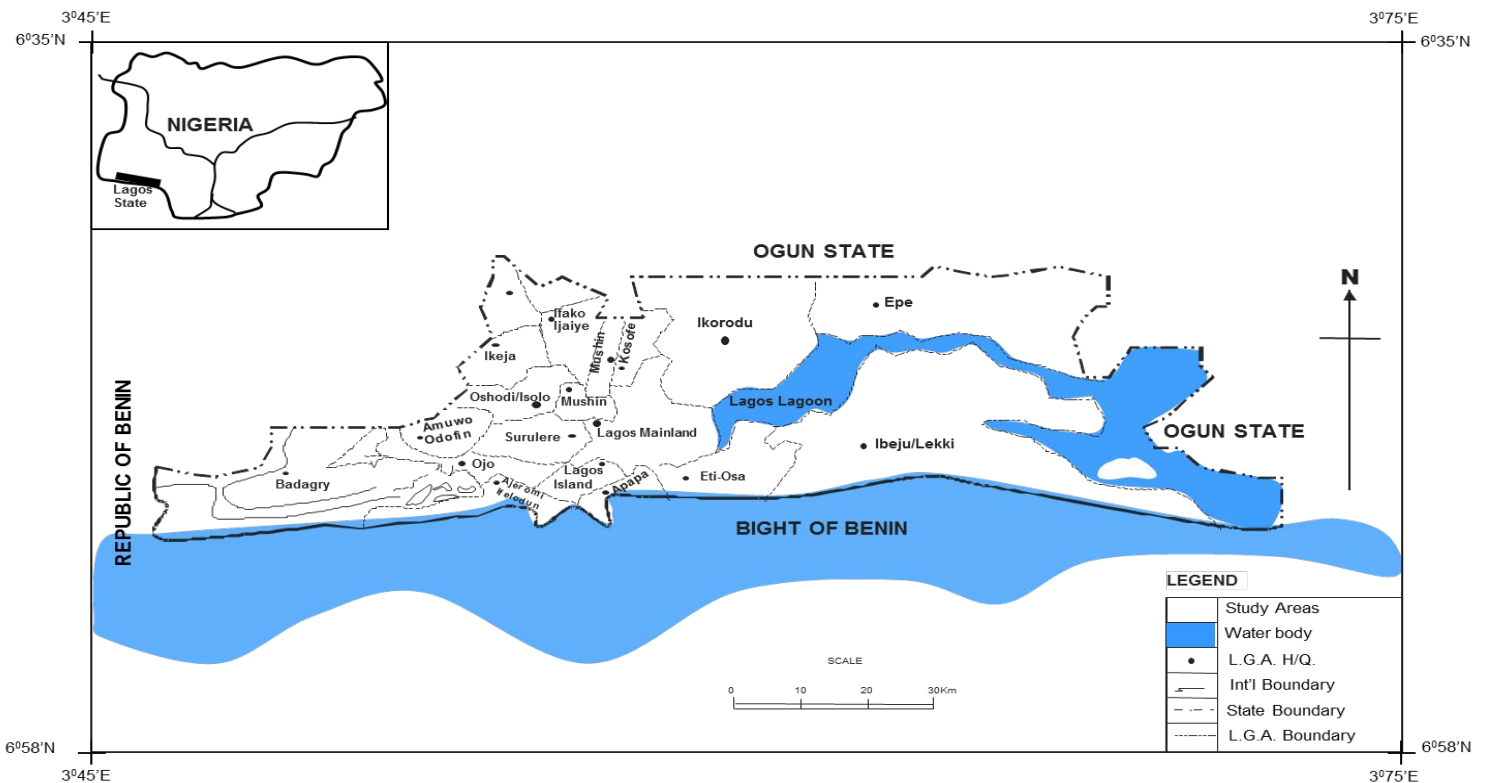
**Study Area**

Lagos city, is a large metropolitan city in South Western Nigeria. It is the most populated urban region on the African continent and the largest city in Nigeria, with an estimated upper population of 21 million. Lagos serves as the economic centre of Lagos State and all of Nigeria, making it a significant financial hub in Africa. Lagos is also one of the 10 fastest-growing cities and metropolitan areas in the world.

Lagos State is situated in the south western corner of Nigeria. From the republic of Benin on the west to its border with Ogun state on the east, this extended state stretches more than 180 kilometres along the Guinea Atlantic coast (see Fig. 1). It is a megacity with one of Africa's biggest and busiest seaports and the continent's fourth-highest GDP.

**Fig. 1:** Map of Lagos state showing the 20 LGA's

**Source:** Lagos state Ministry of Environment and Physical Planning (2020)

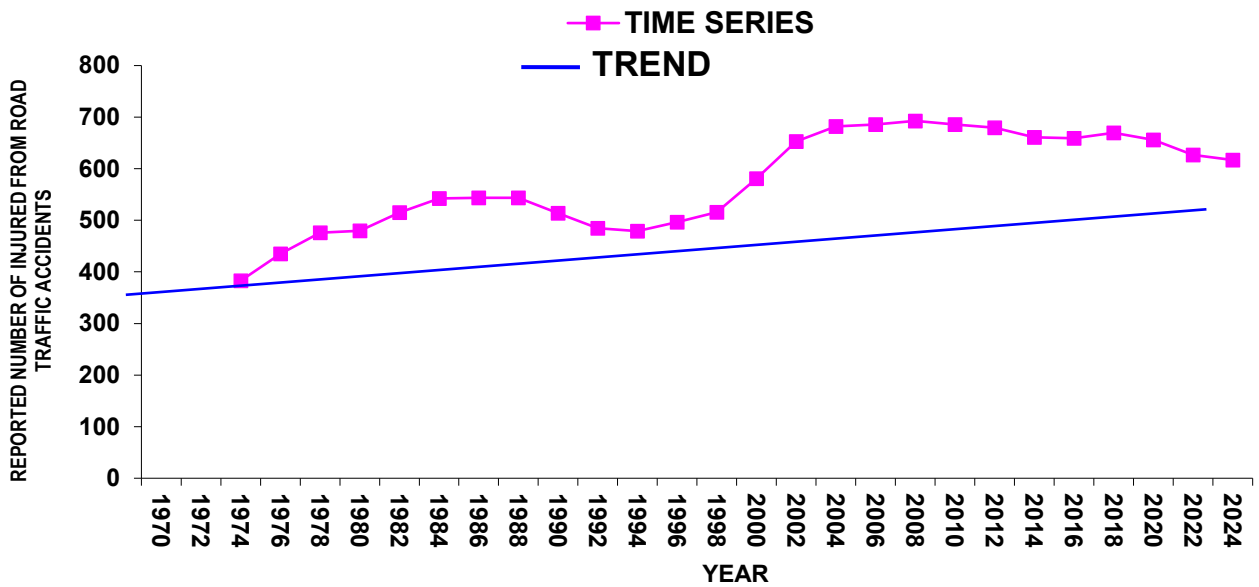


**Methods**

Annual reports for the period 1970-2023 were obtained from the Nigeria police force (NPF) and the Federal Road Safety corps of Nigeria (FRSC). These reports were analysed for trends in road traffic crashes (RTC's) including injuries. The longitudinal study regressed secondary data on injury tolls against length of roads (KM), presence of road safety and population.

**Discussion of Results/Findings**

In an attempt to examine the temporal pattern of the reported number of those injured from road traffic accidents in Lagos state, the time series and trend analysis of the injured statistics in respect to each of the selected local governments were undertaken. The results of these analyses are shown in (Fig. 2). The time series and trend of the reported number of injuries from traffic accidents in Lagos State are shown by these figures. The time series analysis of the reported number of people hurt in traffic accidents in Lagos State reveals fluctuations throughout time, as illustrated in Fig. 2. The year 2008 recorded the highest figure of 692 while the least was in 1974 with 383 injured from road traffic accidents. The trend of injured from road traffic accidents as shown in this figure 2 reveals that the phenomenon is on the increase, in other words, the gradient of injured occurrence from road traffic accidents is on the increase in Lagos State between 1970 and 2023. This is as a result of the fact that there are more roads in Lagos now and more vehicles compared to the 1970's hence more injuries on the road.



**FIG. 2:** Time Series and Trend of the Reported Number of Injured from Road Traffic Accidents in Lagos State (1970 – 2023)

As shown in Fig. 3, the time series of injured from road traffic accidents for Lagos Island local government area shows variation overtime. The year 1986 recorded the highest figure of 88 injured while the least was in 2022 with injured from road traffic accidents of 32. The trend of phenomenon is on the decrease, in other words, the trend of injured is on the downward direction over the years. This shows that the occurrence of injured from road traffic accidents is on the decrease in Lagos Island Local Government Area between 1970 and 2023 as revealed by the trend analysis.

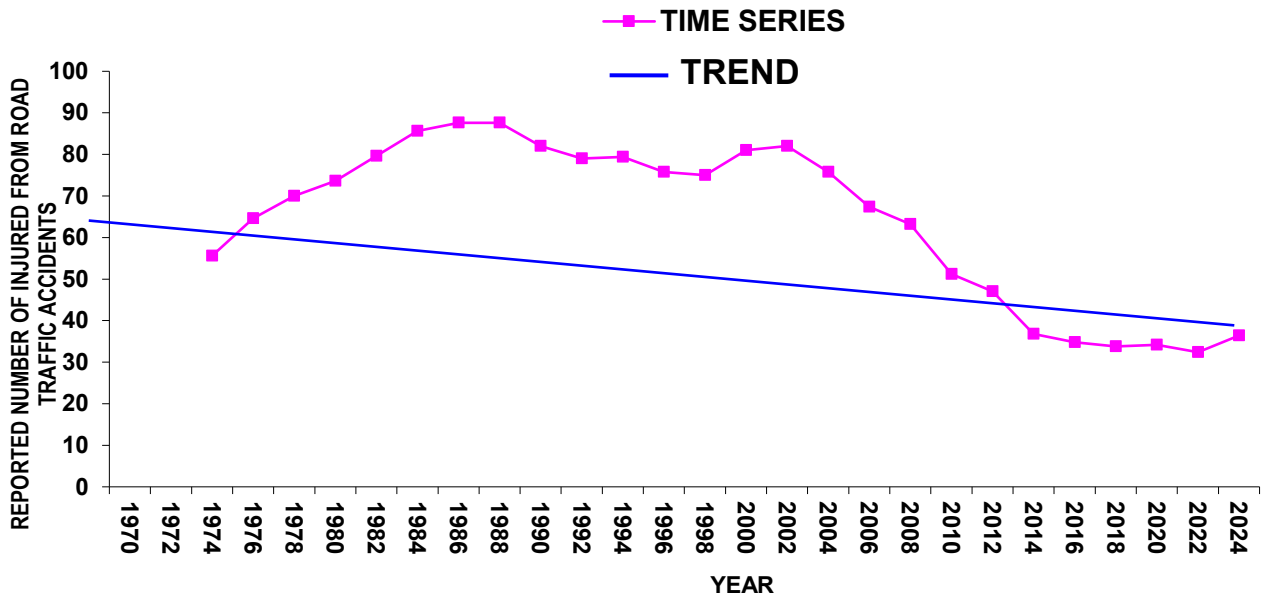


FIG. 3: Time Series and Trend of the Reported Number of Injured from Road Traffic Accidents in Lagos Island Local Government Area (1970 – 2023)

The time series of injured from road traffic accidents for Ikorodu Local Government Area reveal that least figure of 23 injured from road traffic accidents in 2020 and the highest figure of 52 in year 1982. The trend analysis however, show that the injured occurrence from road traffic accidents is on the decrease in Ikorodu Local Government Area as the trend is on the downward direction (Fig. 4)

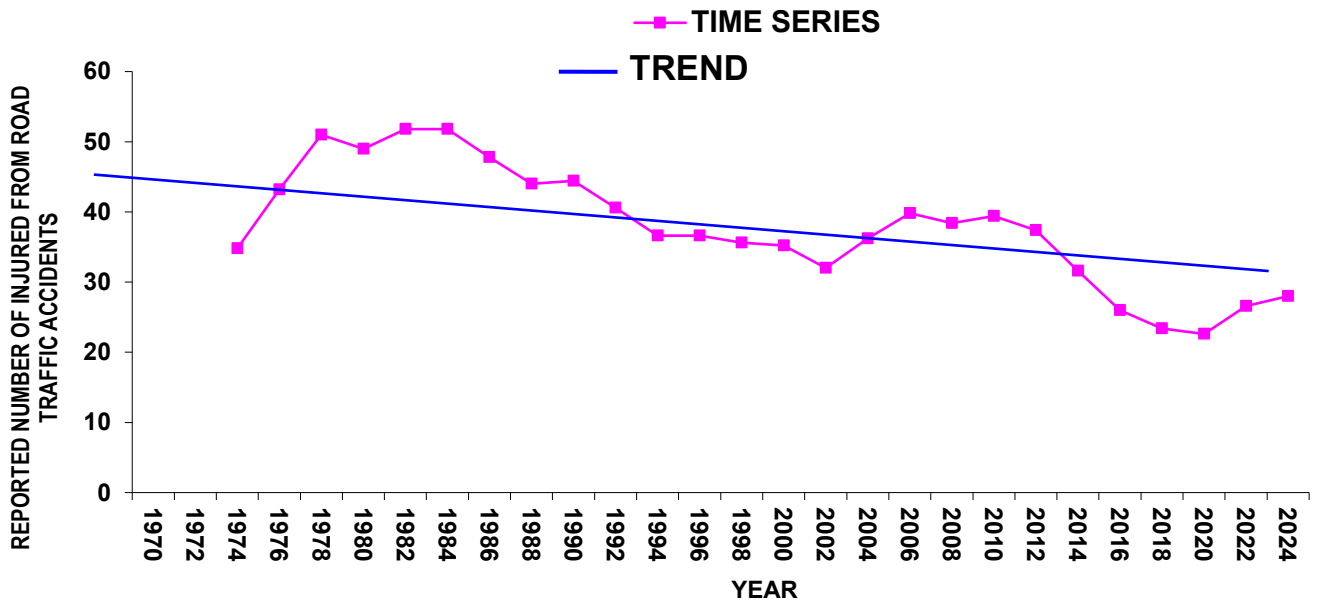


FIG. 4: Time Series and Trend of the Reported Number of Injured from Road Traffic Accident's in Ikorodu Local Government Area (1970 – 2023)

The time series of injured from road traffic accidents for Ajeromi/Ifelodu Local Government Area reveal that least figure of 31 injured from road traffic accidents in 2014 and the highest figure of 76 in year 1984. The trend analysis however, show that the injured occurrence from road traffic accidents is on the decrease as the gradient is in downward direction (Fig. 5).

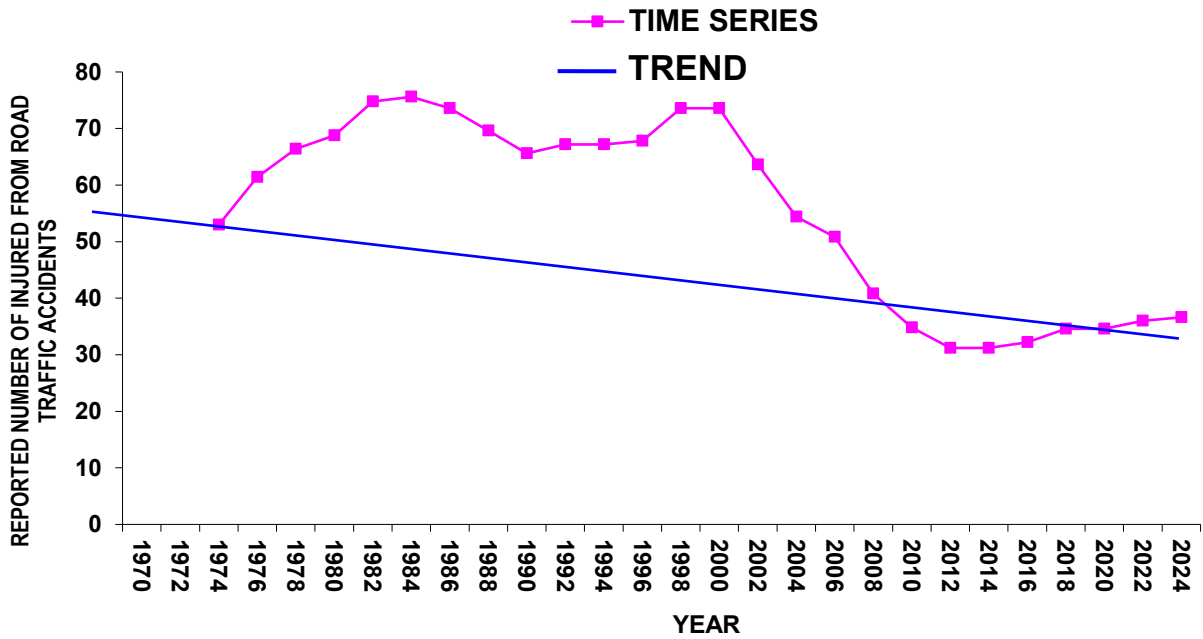


FIG. 5: Time Series and Trend of the Reported Number of Injured from Road Traffic Accident’s in Ajeromi/Ifelodun Local Government Area (1970 – 2023)

The time series of injured from road traffic accidents for Badagry Local Government Area reveal that least figure of 28 injured from road traffic accidents in 2014 and the highest figure of 46 in year 1984. The trend analysis however, show that the injured occurrence from road traffic accidents is on the increase as the gradient is in upward direction (Fig. 6)

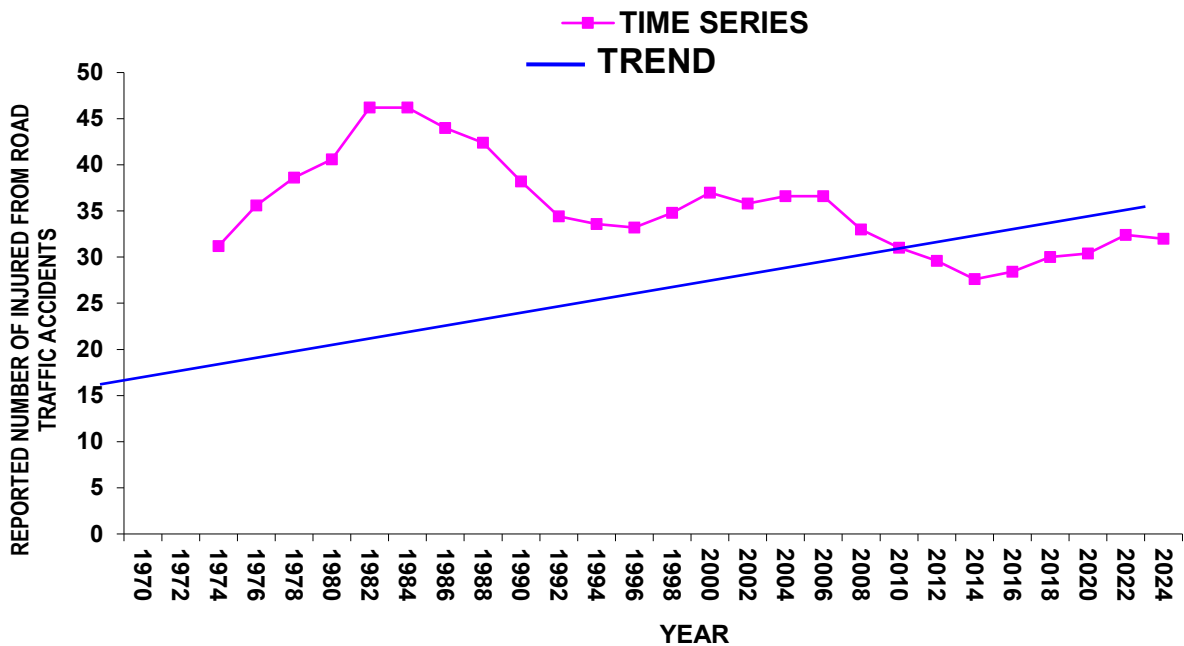


FIG. 6: Time Series and Trend of the Reported Number of Injured from Road Traffic Accident’s in Badagry Local Government Area (1970 – 2023)

For the Epe Local Government Area, the time series show the highest injured from road traffic accidents of 40 for 1990 and least figure of 21 for 2023. The trend as shown in figure 7, shows the phenomenon was on the decrease over the years.

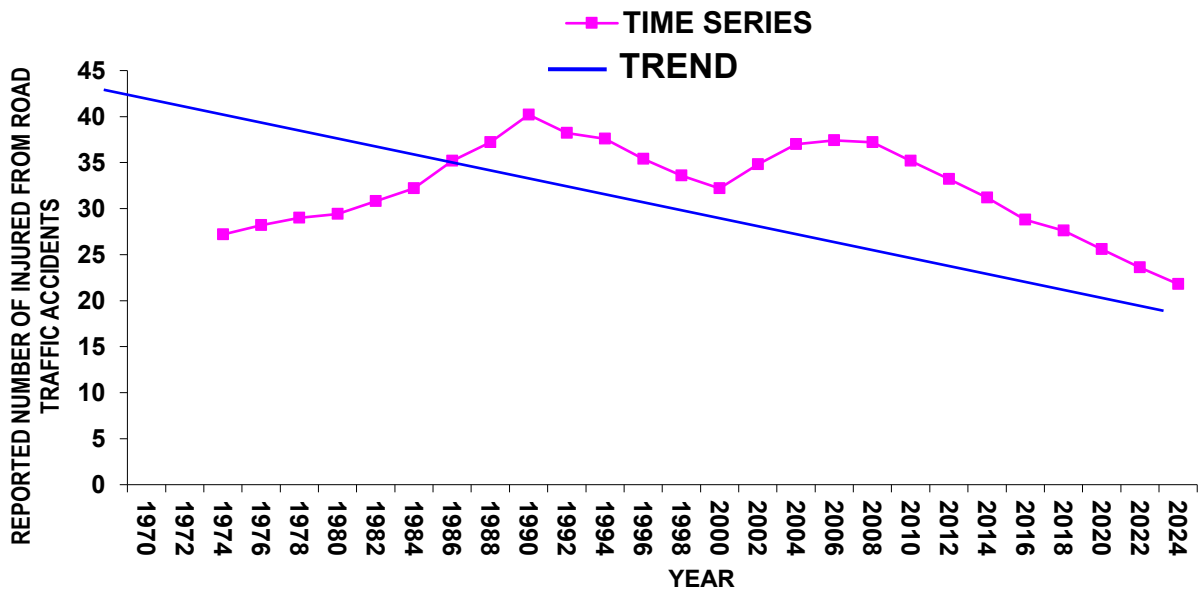


FIG. 7: Time Series and Trend of the Reported Number of Injured from Road Traffic Accident’s in Epe Local Government Area (1970 – 2023)

The time series of injured from road traffic accidents for Ikeja Local Government Area reveal that least figure of 45 injured from road traffic accidents in 2023 and the highest figure of 93 in year 1990. The trend analysis however, show that the injured occurrence from road traffic accidents is on the decrease as the gradient is in downward direction (Fig. 8)

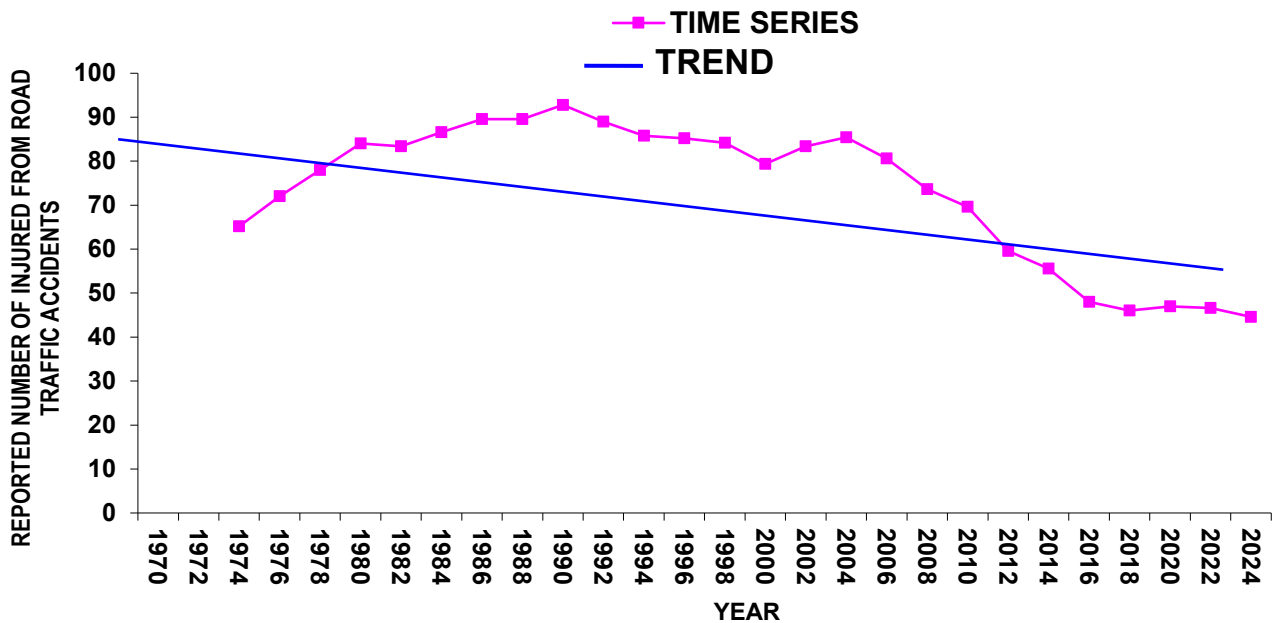


FIG. 8: Time Series and Trend of the Reported Number of Injured from Road Traffic Accident’s in Ikeja Local Government Area (1970 – 2023)

Mushin Local Government Area reveal the least figure of 28 injured from road traffic accidents in 2022 and highest figure of 75 in year 1990. The trend of the gradient is in downward direction (Fig. 9).

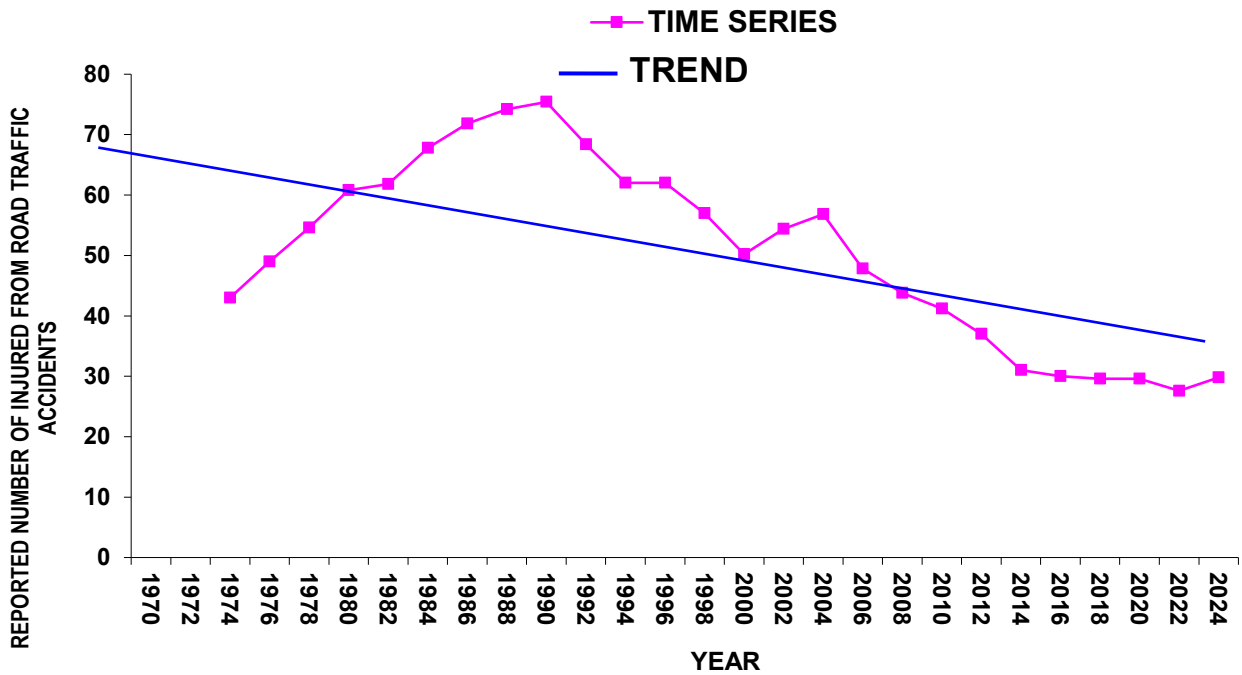


FIG. 9: Time Series and Trend of the Reported Number of Injured from Road Traffic Accident’s in Mushin Local Government Area (1970 – 2023)

Lagos Mainland Local Government Area reveal the least figure of 34 in 2023 and the highest figure of 88 in year 1986. The analysis show that the injured occurrence from road traffic accidents is on the decrease as the gradient is in downward direction (Fig. 10).

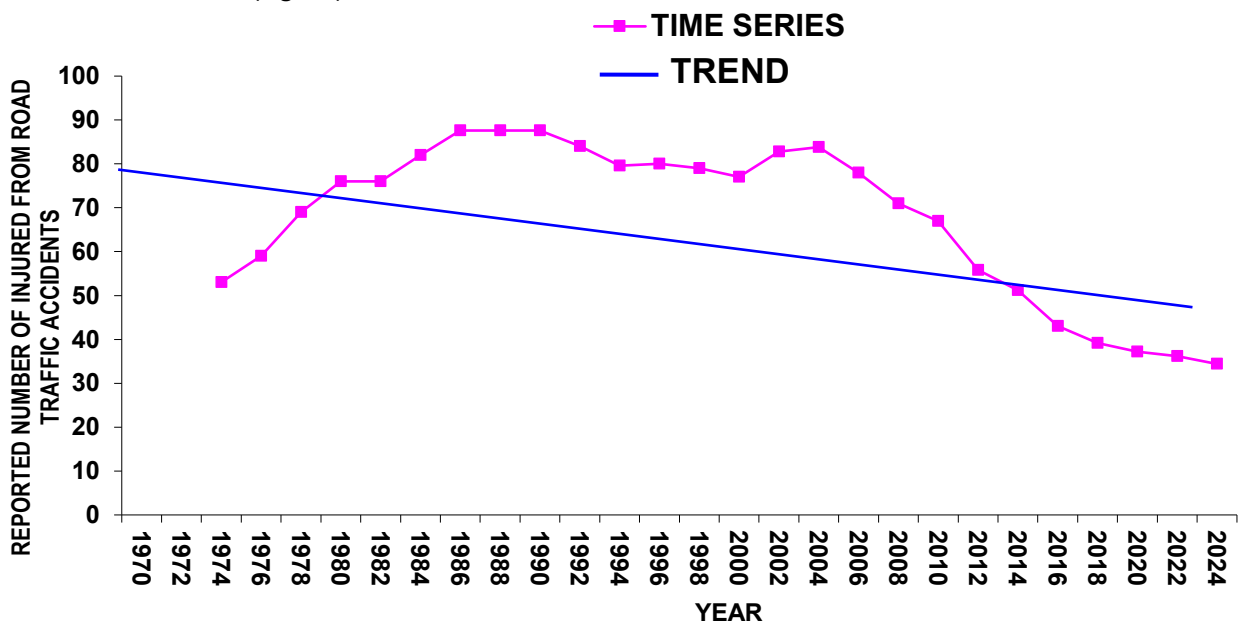


FIG. 10: Time Series and Trend of the Reported Number of Injured from Road Traffic Accident’s in Lagos Mainland Local Government Area (1970 – 2023)

In order to determine the factors that influence the number of injured from road traffic accidents, a multiple regression analysis was done, out of the three model tried the linear form proved better than the double log form and log form considering the number of significant variables. Sign of the coefficients with respect to a prior expectation and the size of  $R^2$ . The result of the analysis shows that  $R^2$  value was 0.82. This suggests that the independent variable accounted for 82% of the variation in the dependent variable (injuries sustained in traffic accidents from 1970 to 2023). The F-ratio of 15.64 was higher than the table value of 2.91 at 0.05 level of

confidence, indicating that at least one of the independent variables had a significant influence on the dependent variable. Table 1 shows the regression result.

**Table 1:** Regression results of the factors of injured from RTA’s in Lagos State

Independent Variables	Regression Coefficients	Std. Error	T. Stat	Remark
Length of roads (km)	1.924	0.752	5.321	S
Presence of road safety	98.536	71.22	1.563	NS
Population	-1.56x10 <sup>5</sup>	0.000	-.982	NS
Constant	39.512	142.211	0.445	

S = Significant at 0.05 level of probability

NS = Not Significant

From table 1, only the number of roads (km) positively and significantly influenced injured from road traffic accidents. This shows that the higher the length of roads (km) the more the number of injured from road traffic accidents. Road safety had positive but not significant effects on injured from road traffic accidents while population had negative but non-significant influence on injured from road traffic accidents. This implies that the number of injured decreases with increased in population in the study area. This result further confirms findings from other studies that the better the quality of the roads in Nigeria, the higher the level of road traffic accidents in the county, because drivers most likely over speed on smooth roads, leading to more frequent and fatal accidents (Atubi and Gbadamosi, 2015; Atubi, 2017).

**Recommendations**

It is recommended in Nigeria that the government should introduce adequate and reasonable policies that can help achieve sustainable development. To help them find criminals on the road, the Federal Road Safety Commission should have access to state-of-the-art facilities. The commission must also have the tools necessary to measure drivers' blood alcohol content; if it exceeds a certain threshold, sanctions ought to be imposed. It should be mandatory for everybody to use seat belts.

In order to provide victims of RTAs with proper care, Nigerian roads urgently need to be repaired, and the country's numerous medical institutions need to be actively revitalised. There is need for increased advocacy on the sanctity of life. In order to decrease traffic accidents and save lives on the roads, governments must also pay more attention to the development and application of policies that improve vehicle and road quality.

**Conclusion**

Ensuring a safe transport system for all users of the road is the goal of the safe system approach to road safety. Such approaches takes into account people’s vulnerability to serious injuries in road traffic crashes and recognises that the system should be designed to be forgiving of human error. In order to eradicate fatal collisions and minimise severe injuries in Lagos State specifically and Nigeria generally, this strategy's pillars are safe roads and safe speeds, road sides, safe cars, and safe road users.

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