

A comparative analysis of road and vehicle qualities as factors of road traffic carnage in Nigeria

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Abstract

Background and Objective: Carnage on roads is a growing concern in Nigeria. Over 27 persons, equivalent to more than 4 families, die daily from road traffic crashes. Two direct factors of a road crash are road quality and vehicle quality. To interrogate and compare both factors to road traffic accidents, the longitudinal study regressed secondary data on death tolls against road quality and vehicle quality.

Materials and Methods: Data on the estimated number of vehicles imported into Nigeria (1992-2021) served as the indicator of vehicle quality on Nigerian roads. The longitudinal study regressed secondary data on death tolls (2013-2019) against road quality (2006-2019) and vehicle quality (1992-2021).

Results: Results showed that road quality is degenerating as well as vehicle quality in Nigeria, resulting in increases in the number of road traffic crashes and the attendant death tolls. For every 1% decrease in road quality, death tolls from road traffic crashes in Nigeria increased by 0.00642% at 5% significance, and for every decrease in vehicle quality, death tolls from road traffic crashes in Nigeria increased by 0.327% at 5% significance.

Conclusion: The study recommended increased advocacy on the sanctity of life and the need for the federal, state and local governments to prioritize policy and implementation of improving the road quality and vehicle quality to reduce road traffic crashes and save lives on Nigerian roads.

1. Introduction

Transport, which serves to convey people and goods from one place to another, is an important element in economic development and a keystone of civilization. Transport provides or improves access to different locations for people and businesses. It facilitates social and economic interactions. Road transport dominates other modes of movement in Nigeria. Rail transportation dwindled and air transport is unaffordable to the poor masses in Nigeria. Waterways are neglected and poorly spread for inland transportation, and leaders are playing politics with the development of seaports¹.

With a population of 200 million people and an average family size of 6 persons, Nigeria has over 33 million families. There are 1.7 million vehicles in Nigeria, with one vehicle serving over 117 people. Therefore, roads are very essential in Nigeria. Yet, most of them are in poor shape and conditions, inaccessible, too narrow, not developed, and full of potholes. Streets lack functional light for plying the roads at night².

Brand-new vehicles are unaffordable to individuals because of galloping inflation and the dwindling exchange rate against the Naira. Only the government affords new vehicles; individual Nigerians have resorted to second-hand (*tokumbo*) vehicles. Before their importation into Nigeria, the vehicles had been involved in serious accident/s and adjudged as irreparable by insurance companies. They are shipped to developing countries, including Nigeria, where they are refurbished and sold as *tokumbo*. These poor-quality vehicles reduce vehicle quality on Nigerian roads. The more they are in number, the lower the

vehicle quality plying Nigerian roads. Poor road quality and poor vehicle quality combine to form the direct factors of road crashes, which have become growing public health hazards and environmental health risks that inflict deaths, disability and financial burdens. Consequently, socio-economic activities and development limp. Poor road quality and poor vehicle quality combine to cause most road crashes which are the leading cause of death in adolescents and people in their prime age in Nigeria³.

Road crashes and attendant death tolls occur at an alarming rate in Nigeria. In 6 months (October 2017 to March 2018), about 2,600 Nigerians died in road traffic accidents. Twenty thousand (20,000) vehicles are involved in road traffic accidents every day in Nigeria, leading to a loss of more than 27 lives or more than 4 families daily to road traffic accidents alone⁴.

The proportion and an absolute number of traffic fatalities witness an upsurge in several developing countries, but there is a downward trend in industrialized nations. The differential is more than 20%¹. There was about 37 road traffic crashes every day in January-March 2022 in Nigeria. Road traffic carnage rose from 4,430 in 2014 to 5,400 in 2015, from 5,049 in 2016 to 5,181 in 2017, and from 5,483 in 2018 to 5,574 in 2019⁵. There is a similar rising trend in road traffic deaths in Nigeria, from 11,832 in 1990 to 12,662 in 1992, from 13,082 in 1993 to 13,879 in 1996, from 14,119 in 1997 to 14,916 in 1999, from 15,229 in 2000 to 15,536 in 2001, from 16,012 in 2002 to 16,867 in 2005, from 17,447 in 2006 to 17,997 in 2011, from 18,358 in 2012 to 18,723 in 2014, and from 19,053 in 2015 to 19,319 in 2017. Although there was a 1.82% decrease in the number of crashes from 3,407 in October-December 2021, the number of lives lost to road crashes January-March period of 2022 increased by 11.02%. A total of 3,345 road crashes were recorded between January and March 2022, giving an average of 37 road crashes per day. There is a 1.33% rise in the number of roads crashes January-March 2022. About 26% of the 3,345 road crashes recorded between January and March of 2022 were classified as fatal cases, while 62.8% were serious cases, and only 374 (11.2%) of the cases were categorized as minor. Nigeria lost a total of 1,834 lives to road traffic crashes between January and March 2022. Male adults accounted for 77.8% of this figure, while female adults were 15.2%. More female children were killed than male children. By way of comparison, 1,652 lives were lost to road crashes between October and December 2021, while 1,834 lives were lost between January and March 2022 – indicating an 11.02% increase in lives lost to road traffic accidents in the succeeding quarter. And, the number of lives lost to road crashes in the January-March 2022 period is higher than those of every quarter of 2021. From the more than 11,800 road traffic casualties that occurred in Nigeria during the fourth quarter of 2021, about 10,200 were injured, while 1,700 were registered deaths⁶.

The estimated number of used vehicles imported into Nigeria, as an indicator of vehicle quality, decreased by 73% from 110,715 in 1992 to 30,000 in 1994, increased further by 1,173% from 7,858 in 1997 to 100,000 in 2001, and increased further by 7,506% from 69,411 in 2016 to 760,543 in 2021⁷⁻¹¹ (Table 3). This showed that vehicle quality degenerated as the number of imported used vehicles increased.

Accidents do not just happen, but they are caused. Two direct factors of road crashes are road quality and vehicle quality. Ninety-five percent (95%) of second-hand vehicles imported into Nigeria are “accidentated” vehicles¹². Other causes are lack of proper driving education and poor driving behaviour, overload, speed, drunken driving, failure to use provided safety devices, inclement weather, poor vehicle maintenance, dangerous and reckless driving or road violation, fatigue, and use of mobile driving devices and gadgets while driving^{2, 13,14}. This situation, which gives cause for worry, prompted the longitudinal study which set out to regress death tolls from road traffic crashes against road quality and vehicle quality to establish and compare the involvement of both factors in road traffic accidents and the resultant carnage on Nigerian roads.

To address the growing issue of road traffic crashes and attendant deaths and loss of property, this study analyzed road and vehicle qualities as the major factors of the carnage on Nigerian roads. It highlighted the need for increased advocacy on the sanctity of life and the need for the federal, state and local governments to prioritize policy and its implementation to improve the road and vehicle qualities to reduce road traffic crashes and save lives and valuable resources in Nigeria.

2. Materials And Methods

The longitudinal study regressed secondary data on death tolls (2013–2019) against road quality (2006–2019) and vehicle quality (1992–2021). The data on road quality was sourced from There are data on death tolls and the estimated number of vehicles imported into Nigeria (1992–2021)^{7–11, 15} as an indicator of vehicle quality on Nigerian roads.

Table 1
Quality of roads in Nigeria

Score	Rank	Year
2.5	131	2019
2.4	133	2018
2.5	129	2017
2.6	127	2016
2.71	125	2015
2.68	125	2014
2.66	127	2013
2.77	115	2012
2.72	121	2011
2.39	128	2010
2.55	112	2009
2.32	115	2008
2.21	113	2007
2.41	92	2006
Source: Chamberlain & Ede ¹⁴		

Table 2
Estimated number of road traffic deaths in Nigeria

Traffic deaths	Year
41693	2019
41008	2018
40325	2017
39802	2016
38749	2015
38703	2014
37831	2013
36948	2012
36572	2011
39757	2010
38996	2009
37759	2008
37853	2007
37662	2006
37445	2005
37400	2004
37774	2003
38361	2002
37094	2001
35748	2000
Source: Azami-Aghdash, Sadeghi-Bazarghani, Heydari, Rezapour & Deralkhshani ¹⁶	

Table 3
 Estimated number of used
 vehicles imported into Nigeria

Year	Used vehicles
2021	760543***
2020	
2019	474300***
2018	
2017	154194**
2016	89411**
2015	112195**
2014	210195**
2013	238193**
2012	228979**
2011	
2010	
2009	
2008	
2007	
2006	
2005	
2004	
2003	
2002	59286*
2001	100000*
2000	50000*
1999	
1998	22858*
1997	7858*
1996	

Year	Used vehicles
1995	
1994	30000*
1993	57143*
1992	110715*

Source: **** Ogbodo & Agbo⁷; *** Nduka, Kelle, Ogoko & Okafor⁸; ** Ukonze, Nwachukwu, Mba, Okeke & Jiburum⁹; Green-Simms¹⁰; * Fisa, Musukuma, Sampa et al¹¹.

2.1 Regression Analysis

The study regressed secondary data on death tolls against road quality and vehicle quality at 5% level of significance.

3. Results And Discussion

Table 4
Model summary of Quality of vehicles, quality of roads and road traffic deaths

Source	SS	df	MS
Model	5068190.4	2	2534095.2
Residual	2609752.93	3	869917.644
Total	7677943.33	5	1535588.67
F(2, 3) =2.91			
Prob > F =0.1982			
R-squared =0.6601			
Adj R-squared =0.4335			
Root MSE =932.69			

From Table 4, the R-squared value of 66.06% (Prob > F = 0.0175) showed that the model was statistically significant.

Table 5
Quality of vehicles, quality of roads and road traffic deaths

(1)	
VARIABLES	Estimated road deaths
Quality of road	-1.86e-03**
	(5.77e-04)
Used vehicles number	-0.00327
	(0.0117)
Constant	70,807*
	(26,333)
Observations	6
R-squared	0.660
Standard errors in parentheses	
*** p < 0.01, ** p < 0.05, * p < 0.1	

Table 5 showed that for every decrease in road quality, estimated road deaths increased by 0.18642%, and this was significant at 5%. This confirmed the report of Bun³ on increasing rates of incidence, morbidity and mortality of road traffic accidents due to the poor state of the roads which have not received the warranted attention in Nigeria. Motor vehicle crashes are the leading cause of death in adolescents and people in their prime age. The finding also falls in line with the submission of *Alfa Tyre Protector Nigeria Enterprises*⁴ that successive governments in Nigeria had failed to fix the death traps called roads, bringing so much pain to road users. It also confirmed the report of the *Dataphyte*⁵ on the rising trend of road traffic carnage from 4,430 in 2014 to 5,400 in 2015, from 5,049 in 2016 to 5,181 in 2017, and from 5,483 in 2018 to 5,574 in 2019. The finding also tallies with the earlier report of Afolabi and Gbadamosi¹ that the proportion and an absolute number of traffic fatalities witness an upsurge in several developing countries, but a downward trend in industrialized nations, with more than a 20% differential.

Table 5 also showed that, for every 1% decrease in the quality of vehicles, estimated road deaths increased by 0.327% at 5% significance. This confirmed the report of Autojosh¹² on increasing rates of incidence, morbidity and mortality of road traffic accidents due to low-quality vehicles especially *tokunbo* or second-hand vehicles which constitute over 95% of "accidented" vehicles (previously involved in terrible accidents), leading to being so badly damaged that insurance companies adjudged them irreparable. Every year, hundreds of thousands of them are shipped into Nigeria from the United States of America, Italy, Canada, Belgium and Germany. In a country with soaring inflation and dwindling Naira

value, only the government can afford brand-new vehicles, while individuals go for *tokumbo* vehicles and internet-enabled gadgets¹⁷.

By way of comparison, for every decrease in road quality, estimated road deaths increased by 0.18642%, whereas for every 1% decrease in the quality of vehicles, estimated road deaths increased by 0.327%. Therefore, deteriorating vehicle quality results in higher road traffic death tolls than a corresponding decrease in road quality.

Death tolls from road traffic crashes have serious consequences in terms of depleting present and future manpower and occasioning profound social challenges. Breadwinners have been lost to road traffic crashes, throwing the family into poverty, jeopardizing the chances of good child upbringing and of obtaining sound education and/or stressing the social family network or African extended family system. Heavy financial costs are usually incurred from road crashes by way of repairing the damaged vehicles, treatment of injuries, and burial of deceased victims, as well as over-tasking already distressed health facilities¹.

Conclusion

The quality of roads dwindles in Nigeria. Besides, vehicle quality degenerates since second-hand vehicles (or *tokumbo* mostly “accidented”, that is, previously involved in a terrible accident and adjudged irreparable by insurance companies) replace the choice of new vehicles which have become unaffordable amid towering inflation and lowering poor exchange rate for Naira. A combination of these factors is the direct cause of unacceptable levels of increases in the number of road traffic crashes and the attendant very high death tolls. Deteriorating vehicle quality results in higher road traffic death tolls than the corresponding decrease in road quality.

Accidents can be prevented by tackling these chief factors, which have not received the warranted attention by the federal, state and local governments. There is a need for increased advocacy on the sanctity of life. There is, also, the need to draw the attention of governments towards addressing the policy enactment and implementation for the improvement of road quality and vehicle quality to reduce road traffic crashes and save lives on roads.

Declarations

Data availability statement

The datasets used and/or analysed during the current study are available from the corresponding author upon reasonable request.

Availability of material and data

The raw datasets used for the current study are available from the corresponding author upon reasonable request.

Ethical approval

The authors did not consider Ethical approval necessary for the study.

Ethics statement

The authors considered ethical statements not applicable to the study.

Informed consent

The authors considered the ethical statement not applicable to the study.

Author contribution

Onyenekenwa C. Eneh conceived the study and wrote the manuscript. C.A. Eneh procured the datasets. C.A. Eneh, C.I. Eneonwo, M.C. Oloto, C.P. Ehiogu and V. Emenuga peer-reviewed the manuscript.

Significance Statement: Growing road traffic crashes account for the death of more than 4 Nigerian families daily. This study analyzed road and vehicle qualities as the major factors of the carnage on Nigerian roads. Findings showed that degenerating road and vehicle qualities are majorly responsible for increases in the number of road traffic crashes and the attendant death tolls. The study is significant in highlighting the need for increased advocacy on the sanctity of life and the need for the federal, state and local governments to prioritize policy and its implementation to improve the road and vehicle qualities to reduce road traffic crashes and save lives and valuable resources in Nigerian.

Conflict of Interest:: The authors declare no competing interest

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