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Appraisal of FRSC Efforts at Combating Road Traffic Accident in Nigeria

Oluwasegun O Aluko
Department of Civil Engineering, Ekiti State University, Ado- Ekiti, Nigeria
Corresponding Author: Oluwasegun O Aluko

ABSTRACT
The burden of road traffic injury and death is high especially in developing countries of the world. This is where Nigeria falls. This paper shows that many developed countries have worked at reducing this burden, which is responsible for the difference between developing and developed countries' road safety experience. The establishment of the Federal Road Safety Corps (FRSC) was an effort at bringing down the burden of road carnage in Nigeria. FRSC, on her part, has developed various activities as strategies to achieve her goals. This paper obtained quantitative data on these activities and the road traffic crash indices associated with them. By using ANOVA and stepwise regression analysis, this paper finds that the analysis shows that the activities do not seem to have any effect on road traffic crash indices. It points out that the fault may be with poorly collected data by FRSC official, too limited data used in this analysis, or that FRSC activities are actually not yielding desired results. The paper recommends a repeat of this study with more data to confirm what is the true situation in Nigeria.

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I. INTRODUCTION

Road traffic crashes always bring huge losses to the victims. This is especially the case when the victims are killed or disabled. The cost or treatment and/or burial usually has a toll on other family members with possible social, physical, and psychological consequences. Nevertheless, road traffic crashes can be prevented. This is partly explained the difference in experience between the industrialized and the developing countries. For examples, it is noted that "over 90% of world's fatalities on the roads occur in low-income and middle-income countries which have only 48% of the world's vehicles" (FRSC, 2012:49). The relatively less attention given to efforts put into reducing road traffic crashes by the developing countries is responsible for this difference in road traffic crash statistics between them and developed countries. In fact, many of the countries with long history of motorization were found to have worked and achieved decreases in the number of road traffic fatality. Table 1 below shows the decreases experienced by some countries between years 1990 and 2000 (Antov and Roivas, 2004)

Table 1: Percentage reduction in fatality by country

	Country	Percentage reduction in traffic fatality
	Estonia	53%
	New Zealand	37%
	UK	34%
	Japan	29%
	Australia	22%

Source: Antov and Roivas (2004)

Similarly, fatality rate which is high in developing countries, has been substantially reduced by other. For most African countries, the estimate for fatality rates per 10000 motor vehicles lie in the range 50 to 150. Table 2 below provides a more broad comparison as mentioned in Jacobs and Aeron-Thomas (2000).

Table 2: Fatality rate across regions

	Region	Fatality rate per 10000 motor vehicles
	East African	72 to 245
	South African	6 to 87
	Central African	8 to 270
	West African	10 to 132
	Latin American	10 to 35

	Asian-Pacific	8 to 37
	Eastern Europe	3 to 40
	Industrialized countries	1.5 to 5

Source: Jacobs and Aeron-Thomas (2000)

Generally, traffic crash occurrence is serious in developing countries and particularly more serious in Africa. Fatality risk in Africa as estimated is provided in table 3 below.

Table 3: Faatality rate for African regions

	Region	Fatality rate per 10000 motor vehicles	Motorization level
	East African	0-12	1-14
	South African	2-31	1-121
	Central African	1-5	0-20
	West African	2-9	11-29

Source: Jacobs and Aeron-Thomas (2000)

In Nigeria, fatal road accidents were on the rise and the major cause of death in adults less than fifty years in the country (Ikhu-Omoregbe, 2005). Records from the FRSC reports show the increasing number of people killed in road accidents: from a figure of 826 in 1960 to an alarming 6966 in 2001 with 1992 recording the highest figure at 6986 fatality. The number injured, according to the same record, rose from 10,216 in 1960 to 30,023 in 1977 and was still 20,757 in 2012. With respect to the number killed, the figure rose from 1083 in 1960 to 11382 in 1982 but has now reduced to 4260 in 2012. These figures are found to be much lower than the estimated values for Nigeria by organizations such as World Health Organization (WHO) (Yerima and Egwurube, 2006). For example, WHO estimates that almost 16,000 people die from injuries sustained in road mishaps in Nigeria, each year, and several thousands more end up with non-fatal injuries and permanent disabilities (WHO, 2004). In contrast, the yearly average of persons killed computed on the bases of FRSC records for the period 1960 to 2012 is 6083.5. These two figures are significantly different. It particularly reinforces the fact that road traffic accident is a serious problem that was not given attention for a long time by Nigerian past governments. While there seem to be some improvement, road safety is still inadequately researched and information is lacking in many aspects of the problem. Underreporting of cases is still widespread; available records vary in quality and questionable values and trends have been observed (Adeloye et al., 2016). Notwithstanding, it is expected that what is reported should be able to provide some guidance in identifying what works and what is inappropriate, especially amidst road safety professionals and organizations. It is on the basis on this that this paper seeks to extract some available data and analyze them to identify useful information that might be provided by the data with respect to road safety improvement measures

II. MATERIAL AND METHOD

This study obtained its data from FRSC Q1, 2016 and April-May Performance Report (FRSC, 2016:20). The data used is titled *Activities of the Corps: Week 1 - 22, 2016 (Q1, 2016)*. This data tabulates a list of activities relating to road safety improvement and includes road safety records for the period. The list of items on the table and their abbreviation (code) in this work is presented in tables 4 and 5 below.

Table 4: FRSC activities and their codes

	Corps Activities /programmes	**Code**
1	No. of Offenders Stopped	OffendSTP
2	No. of Drivers Cautioned	DriverCAUT
3	No. of Offenders Apprehended	OffendAPPRE
4	No. of Traffic Offences Committed	trafficOFFENCEcomm
5	No. of Traffic Offenders Educated	trafficOFFEeducate
6	No. of TV programmes Held	TV
7	No. of Radio programmes Held	Radio
8	No. of Motor Park Rallies Held	MotPARK
9	No. of Fleet Operators Registered	FOR
10	No. of Passengers Travelled	PassenTRAV
11	No. of Vehicles Travelled	VehicleTRAV
12	No. of Vehicle Number Plates Produced	VNP
13	No. of National Drivers' License (NDL) Produced	NDL
14	No. of Drivers Trained by FRSC	driverTRAINED
15	No. of Driving Schools Registered	drivingSCHreg
16	No. of Luxury Buses Travelled	LuxuryBUS

Table 5: Road traffic crash indices

	Road Traffic Crash factors	Code
1	No. of RTCs	RTC
2	No. of Persons Killed	personKILL
3	No. of Persons Injured	personINJURED
4	No. of Persons Involved	personINVOLVE
5	No. of Vehicles Involved	VehINV

The analysis method adopted ANOVA and Stepwise Regression to test the significance of the activities on road safety records for the time considered. This analysis is reported in the next section.

III. DATA ANALYSIS

3.1 Analysis for Number of Road Traffic Crashes (RTC)

3.1.1 RTC on all factors

At 5% level of significance ANOVA, the overall regression model is not reliable since P-value is more than α-value of 0.05. Since none of the P-value for all the factors is more than the α-value of 0.05, none of the factors has significant relationship with RTC

3.1.2 RTC on all factors using stepwise regression

Model Summary

R R Square Adjusted R Square Std. Error Error

Using stepwise regression, only NDL is significantly related to personKILL. This implies that that only NDL can be used to predict personKILL

3.3 Analysis for Number of Persons Injured

3.3.1 personINJURED on all factors

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.954[a]	.911	.625	60.56390

ANOVA

	Sum of Squares	Df	Mean Square	F	P-value
Regression	187252.435	16	11703.277	3.191	.102[b]
Residual	18339.929	5	3667.986		
Total	205592.364	21			

Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	P-value.
	B	Std. Error	Beta		
(Constant)	643.085	581.584		1.106	.319
offendSTOP	-.137	.584	-1.787	-.234	.824
driverCAUT	.442	.568	.601	.778	.472
offendAPPRE	-.478	.674	-6.009	-.708	.510
trafficOFFENCEcomm	.541	.493	7.709	1.098	.322
trafficOFFEeducate	-.221	.106	-1.209	-2.074	.093
TV	**11.279**	**4.028**	**.577**	**2.800**	**.038**
Radio	2.593	2.247	.361	1.154	.301
MotPARK	-1.464	.789	-.725	-1.857	.122
FOR	-.240	.522	-.116	-.461	.664
passenTRAV	-1.017E-005	.000	-.038	-.177	.866
vehicleTRAV	.000	.000	.318	1.750	.140
VNP	**-.011**	**.004**	**-.579**	**-2.644**	**.046**
NDL	-.009	.005	-.655	-1.755	.140
driverTRAINED	.068	.070	.239	.972	.376
drivingSCHreg	2.571	1.366	.503	1.882	.119
luxuryBUS	-.057	.037	-.352	-1.563	.179

At 5% level of significance ANOVA, the overall regression model is not reliable since P-value is more than α-value of 0.05. But TV and VNP are significantly related to personINJURED. Especially TV advertorials has a very positive effect on personINJURED.

3.3.2 personINJURED on all factors using stepwise regression

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.730[a]	.533	.510	69.27719

ANOVA

	Sum of Squares	df	Mean Square	F	P-value
Regression	109605.771	1	109605.771	22.838	.000
Residual	95986.593	20	4799.330		
Total	205592.364	21			

Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	P-value
	B	Std. Error	Beta		
(Constant)	1094.932	119.284		9.179	.000
trafficOFFEeducate	-.133	.028	-.730	-4.779	.000

Using stepwise regression, only trafficOFFEeducate is significantly related to personINJURE. This implies that that only trafficOFFEeducate can be used to predict personINJURE

3.4 Analysis for Number of Persons Involved

3.4.1 personINVOLVE ON ALL FACTORS

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.967[a]	.935	.729	94.76871

ANOVA

L	Sum of Squares	df	Mean Square	F	P-value
Regression	650195.910	16	40637.244	4.525	.052[b]
Residual	44905.544	5	8981.109		
Total	695101.455	21			

Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	P-value
	B	Std. Error	Beta		
(Constant)	1341.401	910.046		1.474	.200
offendSTOP	.752	.914	5.349	.823	.448
driverCAUT	-.232	.890	-.172	-.261	.804
offendAPPRE	-.924	1.055	-6.323	-.876	.421
trafficOFFENCEcomm	.172	.771	1.336	.224	.832
trafficOFFEeducate	**-.434**	**.167**	**-1.292**	**-2.604**	**.048**
TV	**23.974**	**6.302**	**.667**	**3.804**	**.013**
Radio	1.609	3.516	.122	.458	.666
MotPARK	**-3.220**	**1.234**	**-.867**	**-2.610**	**.048**
FOR	.485	.817	.128	.594	.578
passenTRAV	3.916E-005	.000	.080	.437	.681
vehicleTRAV	.000	.000	.286	1.848	.124
VNP	-.011	.006	-.315	-1.690	.152
NDL	-.021	.008	-.787	-2.479	.056
driverTRAINED	-.092	.109	-.177	-.845	.437
drivingSCHreg	**6.314**	**2.137**	**.672**	**2.954**	**.032**
luxuryBUS	-.105	.057	-.352	-1.835	.126

At 5% level of significance ANOVA, the overall regression model is not reliable since P-value is more than α-value of 0.05. trafficOFFEeducate, TV and MotPARK, and drivingSCHreg are significantly related to personINJURED. Especially TV advertorials has a very positive effect on personINVOLVED

3.4.2 personINVOLVE on all factors using stepwise regression

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.682[a]	.464	.438	136.42636

ANOVA

	Sum of Squares	df	Mean Square	F	P-value
Regression	322858.446	1	322858.446	17.347	.000
Residual	372243.008	20	18612.150		
Total	695101.455	21			

Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	P-value
	B	Std. Error	Beta		
(Constant)	2069.719	235.462		8.790	.000
offendAPPRE	-.100	.024	-.682	-4.165	.000

Stepwise regression shows that only offendAPPRE is significantly related to personINVOLVE.

3.5 Analysis for Number of Vehicles Involved

3.5.1 vehicleINVOLVE on all factors

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.904[a]	.818	.236	36.10217

At 5% level of significance ANOVA, the overall regression model is not reliable since P-value is more than α-value of 0.05. Since none of the P-value for all the factors is more than the α-value of 0.05, none of the has significant relationship with vehicleINVOLVE

3.5.2 vehicleINVOLVE on all factors using stepwise regression

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.517[a]	.267	.231	36.21420

ANOVA

	Sum of Squares	df	Mean Square	F	P-value
Regression	9575.723	1	9575.723	7.302	.014
Residual	26229.368	20	1311.468		
Total	35805.091	21			

Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	P-value
	B	Std. Error	Beta		
(Constant)	439.559	62.355		7.049	.000
trafficOFFEeducate	-.039	.015	-.517	-2.702	.014

Using stepwise regression, only trafficOFFEeducate is significantly related to vehicleINVOLVE. This implies that that only trafficOFFEeducate can be used to predict vehicleINVOLVE

IV. DISCUSSION

A test of the effect of various activities of FRSC on the *number of road traffic crashes* shows that no reliable model could be obtained. The same thing was observed for all the four other road traffic accident factors: *number of persons killed; number of persons injured; number of persons involved and; number of vehicles involved*. This puts the quality of the data to question. Could it be that the amount of data analyzed is inadequate for obtaining useful information? Or can there be inconsistency in the data itself? This is more so as it has been previously observed that a lot of registry-based data are inconsistent and difficult for making accurate estimation (Adeloye et al., 2016; Aidoo, et al., 2013). Where the quality of data is not the problem, a direct implication is that the various efforts being mobilized by FRSC into these road safety activities are not yielding any result and thus should be discontinued. The way forward would be to consider other measures in fighting road carnage.

In addition, when individual activities were tested using stepwise regression, it was however found that the *number of traffic offenders educated* has some predictive effect on the number of *road traffic crashes*. This sounds logical. But, the *number of NDL produced* was found to be significantly related to the *number of persons killed* in the following stepwise regression conducted. This is unusual bearing in mind that it is possible to drive without being licensed in Nigeria and possession of drivers' license does not confirm ability to drive safely. It therefore raises a question of why license production should be related to road traffic death.

Furthermore, with respect to the *number of persons injured*, both *number of vehicle number plates produced* and *the number of TV programmes held* had effect on the *number of persons injured* in ANOVA analysis. This again, nevertheless, underlines the level of unreliability of the model developed as it is in doubt whether there should be any relationship between number plate production and the number of injured person in road crashes. Moreover, when the effect of individual factors was tested for using stepwise regression, a different finding was made. It showed that the *number of traffic offenders educated* could be used to predict the *number of persons injured*, ignoring both *number of vehicle number plates produced* and the *number of TV programmes held*. While a relationship between *number of traffic offenders educated* and *number of persons injured* looks logical, the inconsistency in the output of the various models reinforces their unreliability.

Also, a test for the relationship between FRSC activities and the *number of persons involved* in accident was conducted. It showed that a number of FRSC activities including *number of traffic offenders educated, number of TV programmes held, number of motor park rallies held,* and the *number of driving schools registered* were related to the *number of persons involved*. When individual activities were compared using stepwise regression, the finding was different. It showed that only *number of offenders apprehended* had a significant relationship with the *number of persons involved* in accident. Lastly, the relationship for the *number of vehicles involved* was tested for. Only *number of traffic offenders educated* was found to be related following stepwise regression analysis.

V. CONCLUSION

Looking at the results of this analysis, it may be suggested that most of the efforts being put in place by FRSC have not been having desired significant effects on road safety indices. This is most likely to be far from the truth. It is possible that the quality of data recorded by FRSC officials is poor and needs to be improved upon. On the other hand, it is possible that the length of time considered in this study is too short to obtain the true impact of FRSC road safety activities. It is therefore recommended that further study be conducted to understand how various strategies adopted by FRSC are impacting on road safety. This is necessary to enable the organization appraise her strategies, drop poorly performing strategies and innovate more result-oriented strategies.

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