

An Appraisal of the Impact of the Dearth of Pre-Hospital Emergency Medical Services to Road Traffic Accident Victims in Nigeria

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ABSTRACT: *The significant role of pre-hospital emergency medical services (EMS) cannot be over emphasized as it encompasses minimizing the consequences of accidents and provides rapid response and relieve materials to victims of road traffic accidents at the scene of the crash. The paper therefore tries to analytically x-ray the relationship between income GDP per capital and the rate of road traffic death to determine the effect of absences of pre-hospital emergency medical services to road traffic victims in Nigeria. The paper makes use of regression as a tool of analysis, with the aid of variables such as record of road traffic accident death and indices on income GDP per capita of the country in focus to draw conclusion or the relationship or otherwise of the argument above. the correlation between the calculated data on death rate from road traffic accident per 10000 population and GDP per capita resulted in a negative strong significant relationship as, $r(19) = -0.79, P = < 0.0001, \beta = 0.79$. The coefficient of the predictor GDP per capita is Significant. ($P=0.0001 < P \text{ value} < 0.05$). Hence rejecting the null hypotheses and accepting the alternative hypotheses. There is a negative significant correlation between income GNI and Road Traffic rate. The paper concludes that there is a significant correlation between the country's income GDP per capita and the rate of death in road traffic accident due to the absences of pre-emergency medical services at the accident scene. It there recommends amongst others that; government must take pro-active measures to abate the occurrences of road crashes and equip the agency responsible for meting out pre-hospital emergency medical services with the requisite tools to function.*

Keywords: *road traffic accident, deaths, injury, fatalities, disability, pre-hospital emergency medical response, health care, trauma, accident victims, GDP*

I. Introduction

The significant role of pre-hospital emergency medical services (EMS) cannot be overemphasized as it encompasses minimizing the consequences of accidents and provides rapid response and relieve materials to victims of road traffic accidents at the scene of the crash. (Schwartz, et al. 1986). The most vital factor relating to the accomplishment of a desired recovery of the accident victim is the initial medical treatments provided to the injured person's within the "golden hours" after the incident. (WHO 1984). Emergency medical conditions do occur when there is a sudden physical attack in form of a hit or a strike to the body or mind, often through injury, infection, obstetric complications and chemical imbalance; which might occur as a result of continues neglect of persistent conditions. Therefore, in other to treat these conditions, emergency medical services require rapid assessment and timely provision of absolute intervention and prompt transportation of victims to the nearest health facilities. (McSwain, N. E. 1991).

Majority of death in traffic accident occur within the first 15 minutes of the incident as a result of injuries from damage blood vessels or internal soft tissues, heart, brain, spinal cord and head injuries. Experience has proven that early treatment and stabilization of injured accident victims and further hospitalizations enhances timely and full recovery. (Coats, T. J. & G. Davies. 2002), wrote from personal experience stating that there is a strong bond between pre-hospital care and the progression of trauma within the first 15 to 30 minutes before the victim's arrival to the hospital. They urged for improved Emergency Medical response to Road traffic crashes and advanced training to personnel (physicians and non- physicians). The International Federation for Emergency Medicine has it that every individual is entitled to immediate medical care in case of an emergency situation. (Bodiwala G.G 2010).

Developing Countries in the sub-Saharan African region are the most vulnerable to this global tragedy, despite the fact of being the least motorized nations among the six world geographical region as classified by (WHO 2013). The index on Nigeria is very alarming to put things mildly, the WHO's report ranked Nigeria as the first in the Africa region with the highest death rate from (RTD), followed by South Africa. The annual incidence of death rate is put at (33.7 death per 100 000 population 31.9 death per 100 000 population respectively much

higher above the projected rate of 18.0 death per 100 000 population). It is disheartening to say that Nigeria has the highest rate of traffic related deaths despite its substantial growth rate; severe injuries are mainly the cause of high mortality rate. (Holder et al ed 2001), and lack of injury surveillance system further worsens the situation as the case in Nigeria (Mulder et al. 2002), where, Pre-hospital care or Emergency medical service to accident victims is practically almost non-existent. (Dr. Michael E. Ugboye 2010)

Road Traffic Death and Emergency medical care

Generally, the best way to reduce traffic death and disability from life-threatening injuries is prevention. Road traffic deaths are preventable and at the same time traffic death impacts negatively on individuals and families within all Socio-economic groups throughout the world. (Ameratunga, et al. 2006). However, it is often possible to minimize the consequences of serious injury, including long term disability or trauma effect by providing an effective emergency medical care. In Nigeria, emergency medical care is given little or no priority in the health sector. An analysis report on “preventable trauma deaths in a country without emergency medical service” by (Solagberu et al 2003), explained that an avoidable death rate of 40% and 73% preventable cases in the emergency room would have been reduced. Another report on Nigeria has it that about 6% of RTA victims were transported to the hospitals in ambulances while the remaining 94% were taken in either private or public cars or buses respectively. (Adeyemi and Sowemimo 1999). It is very pathetic that the first responders to any accident scene in the highways are passers-by, mostly Villagers or local peasant and traders with no knowledge of First Aids treatments. Victims are left to their own mercy with no medical support of any kind in the first few “golden minutes” of the incident. (Seun Akioye 2014). The lack of medical facilities or emergency medical assistant can be said to have cost the nation a great pain. Recently a minister in the federal executive council lost his life and that of his wife and son, to worsen the situation six doctors alongside the driver were also killed in the axis of the Abuja-Kaduna high way; the death might have been reduced if EMS is available. Timely and effective response to RTA victims has been a major problem in Nigeria, and the consequences are that thousands of Nigerians are losing their lives daily.

The State of the Nigerian Health care System

The single issue that is threatening to overwhelm every investment in the healthcare system in Nigeria is not always about the availability of facilities but the “Lack of interest and love of saving lives and bring succour to the patients as enshrined in the ethics of the profession “rather the act of passion and patriotism have been painfully and slowly replace by self-interest and the love for money. The success of any health-care system is determined by the ability and commitment of its medical personnel. The failure of successive leaders to pay adequate attention to the Health care sectors has contributed to the dearth of the system. (Dr. Abdulmunimi Ibrahim 2016).

The healthcare system has been neglected for decade the level of decay in infrastructures and the use of obsolete equipment’s have proven the state of the health care system. Lack of provision of facilities in the public health care system has immensely contributed to the strain in the medical p5rofession in search of better option; this has resulted to brain drain in the medical field. A source from the Medical and dental council of Nigerian reveals that a total of over 80000 registered medical doctors in Nigeria and only about 50000 are presently practicing in the country with over 25000 in United States and about 15000 United nations and other countries, from the look of things this strain will continue and worsen the weak health system unless the authorities concerns are determine to address the factors responsible for this drift. (Ejim, A. 2014)

On the overall, a situational analysis of Nigerian Health care system as reported by the (WHO) is very alarming but to put things mildly; the report ranked Nigeria at the 187th position of the 190 countries surveyed to have the worst health care system. It is pathetic that we are sadly ranked just ahead of the world’s poorest countries of Central Africa Republic (CAR), Myanmar and Burundi. (WHO 2000). More so, the statistical indices of the (WHO) on health care delivery system shows Nigeria has the highest maternal mortality ratio in Africa and the second highest in the world, (454 deaths per 100 000 lives births everyday 800 women dies during pregnancy and childbirth related cases, while 800 new born babies die during their first month of life).

Risk Factors and Economic cost.

The absences of Emergency Medical services in Nigeria have created a vacuum within the system. The highways have since assumed a terrifying and deadly spot of misfortunes. (Seun Akioye 2014) .Road traffic death is now a pandemic, virtually striking the economic viable group of the population. The World Health Organisation has predicted that RTA will be the third leading causes of untimely death globally by 2030 (WHO 2013). This implies that Road Traffic Death is on the increase, and the overall effects of these injuries and death constitute a high magnitude of psychological losses and the socio-economic damages which is enormous development, (Ameratunga, et al. 2006). In Nigeria the common causes of traffic accident apart from the human factors of (Alcohol driving, over speeding,) is the decaying state of the Nigerian roads, paved with port holes

,inadequate road signs, poor infrastructure, lack of maintenance of existing structure, poor enforcement of traffic laws and non-implementation of regulations and sanctions. (Michael E. Ugbeye 2010).

It is very demanding to invest and sustain in pre-hospital care system and provision of other essential facilities due to their capital intensive nature. Developing country like Nigeria, where there are many others priorities especially in health sector. Therefore, provision of pre-hospital emergency system is almost impossible. Further to this, the absence of health insurance and cost-recovery mechanisms may further complicate the issue. Numerous studies have shown that income and governance have greater influence in post-crash response and pre-hospital care to RTA victims and plays a fundamental role in life saving and bringing succour to victims. (Ha, E. 2012). In a different analysis on Road traffic accidents by (WHO, 2009, P.2), US\$518 billion was estimated as the world economic cost on RTA per year. Also Penden et al (2004, P.5) in their report "road crash traffic injury prevention estimated 1% of Gross National Product in low-income countries and 1.5% in middle-income countries and 2% in high-income countries." as what is spend yearly on RTA

II. Review Of Related Literature

This studies on pre-hospital emergency care to road traffic death, including exploring the literature on income and governance on pre-hospital response. According to (Peden, et al. 2004) Accidents are unfortunates and unexpected events and does not give rooms for selection to determine its fatalities or non-fatalities. Issues of road traffic accident in Nigeria has for a long time been left unattended; a good number occurring almost on daily basis on the high ways. This menace has threatened the very survival of the economy, engulfing the fragile health care system. (Jacobs G 2000). Various factors are directly or indirectly involved in cause of RTD and many literatures have been written. For the purpose of this study, the Haddon Matrix approaches (1968, 1980) are used to form the basis of the literature.

Rationale for Theory Choice

There are numerous causes of Road traffic accidents and their after effects can be conveniently classified using the Haddon matrix model with the addition of Runyan's (1998) social-ecologic model. This gives an insight for evaluation of the comprehensive impact of income and governance on pre-hospital systems component on road traffic deaths. Williams Haddon believed that descriptive approaches to injury lacked scientific approach and so he proposed that multiple factors influenced a vehicle crash event. The basic epidemiologic structure of this matrix is that a crash and the impact of the crash are combination of pre-event, event, and post event occurrences influenced by human/host, vehicle/agent, and social, political, and environmental conditions (Haddon Jr, W. 1980)

The Haddon matrix was used in the report conducted by WHO report on "Road traffic injury prevention: An assessment of risk exposure and intervention cost-effectiveness in difference world regions" (Penden M. et al. 2004), and study by (Grimm, M. & Treibich, C. 2012) on "Income and road traffic deaths" using the Haddon matrix. Another study (Albertsson et al 2003) used the Haddon matrix in their investigation of road traffic death in developing countries. In their analysis, Paden et al. (2004, p. 93) analysis the pre hospital systems in the Haddon matrix as the risk factors for the post event (outcome), or what (Runyan, C. W. 2003) considered as the potency of the pre-event and post-event social or political environment. They also conclude that weak public health infrastructure in many Developing nations (i.e. low-income and middle-income nations is the prime risk factor. while in developed nations, the pre-hospital risk factors are not noticeable, even though they exist in limited instances to improve the existing component of the post-impact care.

Income and Road Traffic Injury

Country's income is a vital factor in road traffic, cutting across the cells of the Haddon matrix. Income is the environmental factor that influences the other cells. Prattle (1998, p. 58) stated that "almost every developing country suffers from a lack of financial resources, and therefore the capital available to spend on road safety improvements, road rehabilitation and maintenance, police enforcement and other governmental-level investments [is] severely limited." Similarly (Ameratunga, et al. 2006), in their report concluded that as income increases economic activities increase as well. Development is bound to take occur because a shift from low-income group to Middle-income group and high income group is paramount.

(Grimm, M. & Treibich, C. 2012), explained that there exist a curved line relationship between a Country's income and road traffic injury and death. As income dribble through the society, people will become wealthier; the need to enhance and upgrade their standard of living. The WHO (2009, p. 234) also concluded that the rate of road traffic injury was influenced by country's income level that is the higher the income, the better the health care system and welfare therefore the lower the rate of injury and deaths from RTA. In the light of the on-going this study seeks to determine pre-hospital emergency response in relation to the reduction of the rate of road traffic deaths using the income level (Gross Domestic Product) GDP Per Capita and to know if there exist a relationship between income per capita, and Road Traffic Death rate and Events in Nigeria. The dependent variable as used in this study is the rate of road traffic death, and road traffic accident data while GDP per capita is the independent variable.

Hypothesis:

H0: There is no significant correlation between income level and Road Traffic accident rate

Ha: There is a negative significant correlation between income GNI and Road Traffic rate.

III. Methodology

Data is obtained from the (Federal Road Safety Commission Annual report on Road traffic accident 2013) and the World Bank report on countries income level. The time frame used is 21 years from 1993 to 2013. The population target is about 174 million people; the largest country and oil exporter in the Africa, blessed with abundant natural and human resources. This study made use of PASW (Predictive analytics Software) or the SPSS statistics the 18-version was used to analyse correlations, t tests, ANOVA, and regressions. Correlations were used to detect relationships among the variables; t tests were used for comparing the means of road traffic accident rate and road traffic death due to absence of medical emergency system within the income level. ANOVA/simple regressions tested the variation in road traffic death and income for the provision effective emergency pre-hospital.

IV. Results And Discussion

The estimated and reported death rates were correlated with the Gross Domestic GDP per capita.

The regression Model:

$Y = a + b * x + e$: where

Y=dependent Variable

a=intercept (constant)

b=slope (regression Coefficient)

x=independent Variable

e=error term

The correlations between both the estimated deaths from road traffic event and the calculated death rate per 100000 Population with the GDP per capita resulted in a significant correlation between the calculated road traffic death rate and the GDP per capita. The degree of freedom, $r(19) = -0.49$, $p = 0.023$, with a $\beta = -0.49$ shows a negatively significant correlation but resulting to a weak relationship and a good possibility of making a type II error whereby we fail to reject the null hypotheses when it is false. However the correlation between the calculated data on death rate from road traffic accident per 10000 population and GDP per capita resulted in a negative strong significant relationship since, $r(19) = -0.79$, $P < 0.0001$, $\beta = 0.79$. The power of β for the latter correlation was -0.79 resulting in a strong negative relationship and a good possibility of rejecting the null hypotheses and accepting the alternative hypotheses.

The coefficient of the predictor GDP per capita is Significant. GDP per capita is Significant ($P = 0.0001 < P$ value < 0.05). the regression model is;

$F(1,19) = 30.80$, $P < 0.0001$ $R = 0.62$

This means that GDP per capita accounts for a unique variance significantly greater than zero if $P < 0.05$. (See Table below and Figures 1 and 2).

Figure 1 shows the scatter plot of GNI per capita and the death rate from road traffic events.

Based on the results of this study of GDP per capita and study estimated death rate from road traffic events, we reject the null hypothesis and accept the alternative hypothesis that there is a significant negative correlation between country road traffic death and income. The alternative hypotheses test is a two tailed hypotheses that states both ways either the higher the income the lower the road traffic death or the lower the income the higher the rate of RTD.

From the analysis above, the ANOVA which is the P value means that there is a clear and unambiguous relationship between road traffic death in Nigeria and the income distribution of the country, in essence the spending of a county on pre-emergency services to victims of road crashes is connected to the number of road crashes that take place. However, this cannot be solely the rationale behind the high level of road crashes experienced, but it is indeed an imperative factor that cannot be underplayed.

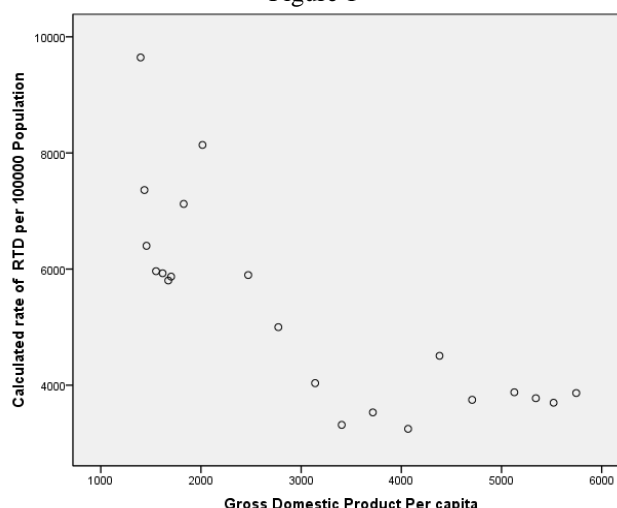
(See Table below and Figures 1 and 2).

Correlations

		Calculated rate of RTD	Gross Domestic Product Per capita
Calculated rate of RTD	Pearson Correlation	1	-.786**
	Sig. (2-tailed)		.000
	N	21	21
Gross Domestic Product Per capita	Pearson Correlation	-.786**	1
	Sig. (2-tailed)	.000	
	N	21	21

** . Correlation is significant at the 0.01 level (2-tailed).

Figure 1



Coefficient Table

Model	Unstandardized Coefficients		Standardized Coefficient	t	Sig.
	B	Std. Error			
1. Constant	8055.407	557.753		14.443	.000
Gross Domestic Product per capita	-.898	.162	-.786	-5.550	.000

a. Dependent Variable: Calculated rate of RTD per 100000 Population

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.861E7	1	3.861E7	30.797	.000a
	Residual	2.382E7	19	1253714.709		
	Total	6.243E7	20			

a. Predictors: (Constant), Gross Domestic Product Per capita

b. Dependent Variable: Calculated rate of RTD per 100000 Population

V. Conclusion And Recommendations

Nearly 1.24 million people die every year on the world’s roads, and another 20 to 50 million sustain nonfatal injuries as a result of road traffic crashes, and of the above figures Nigeria – the most populated country in Africa is the most hit –. These injuries and deaths have an immeasurable impact on the families affected, whose lives are often changed irrevocably by these tragedies, and on the communities in which these people lived and worked. The overall global road traffic fatality rate is 18 per 100 000 population. However, middle-income countries – particularly Nigeria – have the highest annual road traffic fatality rates, at 20.1 per 100 000, while the rate in high-income countries is lowest, at 8.7 per 100 000. Eighty per cent of road traffic deaths occur in middle-income countries, which account for 72.2% of the world’s population, but only 52% of the world’s registered vehicles. This indicates that these countries bear a disproportionately high burden of road traffic deaths relative to their level of motorization. It is also evident that the relationship between income of a country and the level of road traffic accident is apparent and cannot be disputed as proven by the data above.

Recommendations

It is traditional in any research endeavour that when problems are identified, solutions are proffered. Proffering solutions takes the shape of recommendations. Recommendations are directed at providing the leeway to solving the research problem. It is against this background that the following recommendations are advanced;

- It is imperative that the government puts in place funding for pre-emergency road crashes, because as evident in our discussion the dearth of pre-emergency or first aid care for victims of road crashes is what leads to high death rates in road crashes. Finance is undoubtedly the rationale behind this insufficiency in the provision of this service.
- It is also very important that the government begins to take rehabilitation and reconstruction of infrastructures seriously, as the bane of infrastructures particularly in the area of motorable roads is seriously lacking in Nigeria. The deplorable state of our roads is an issue of concern, as it contributes to fatality of crashes on the road.
- The legislators need to increase adoption of comprehensive legislation relating to key risk factors for road traffic accidents. This change needs to rapidly accelerate if the target of the United Nations General Assembly resolution is to be met by Nigeria (i.e. 50% of countries to have comprehensive legislation on key risk factors by 2020).
- Nigeria requires sufficient resources to support enforcement of road safety laws to realize their full benefit: currently enforcement of laws relating to key risk factors is considered poor in this country. The use of strong social marketing campaigns can play an important role in decreasing fatalities. There are minimum elements needed in national laws related to the key risk factors (speed, drink-driving, motorcycle helmets, seat-belts and child restraints), and these should be rolled out throughout the country.
- Reducing the total number of global road traffic deaths requires that increased attention be paid to improving the safety of pedestrians, cyclists and motorcyclists. Half of all road traffic deaths occur among these road users, and yet less than one third of all countries have put in place measures to promote forms of non-motorized transport that will be safe for those using them. Governments must actively address the safety and mobility needs of these more vulnerable road users, and consider how non-motorized forms of transport can be safely integrated into more sustainable and safer transport systems.
- In addition, there are a number of other areas that governments need to address to ensure Road Safety. These include making road infrastructure safer, intensifying work to improve the proportion of vehicle fleets that meet international crash testing standards, and improving post-crash care.

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