

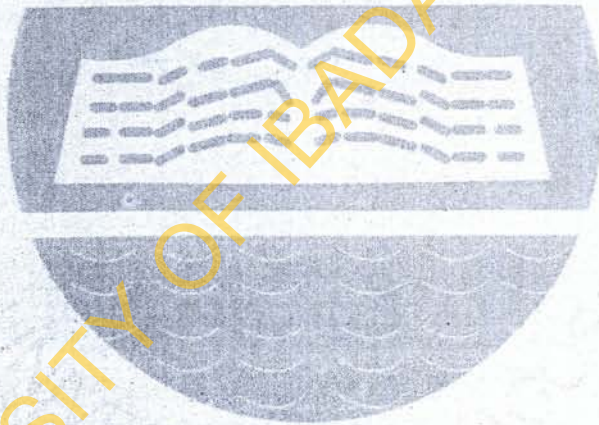


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A Review of Road Traffic Fatalities and Counter Measures in Sub Saharan Africa

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Abstract

Road traffic crashes are a major global problem. The problem is more acute in developing countries, especially in Sub-Saharan Africa which has one of the worst road death rates in the world. The study therefore, evaluated road traffic fatalities and their countermeasures in selected countries in Sub-Sahara Africa. Data was collected from existing literature and secondary sources. Descriptive analysis such as tables of percentage was used for data analysis. Findings indicated that countries such as Angola and Sierra-Leone recorded over 100% and 200% increase in fatality rate respectively between 1999 and 2010. However, fatality rate dropped by between 17% and over 50% in countries such as Botswana, Namibia and Nigeria during the period of analysis. Estimates based on modelled data and reported cases of fatality rate showed a wide disparity in all selected countries in Sub-Sahara Africa. Also, human error comprising poor driving skill, alcohol intake and non-compliance with traffic rules and regulations accounted for more than 70% of the cause of road crashes in the region. An evaluation of 4Es (Engineering, Education, Enforcement, Emergency Response) adopted to ameliorate the rate of road carnage in these countries showed a modest achievement. Rumble strips reduced road fatalities by 55% in Ghana while Police increased enforcement also reduced crash death by 17% in Uganda. The paper calls for improved method of road fatality data collection, appropriate road safety policies and regulations to stem road traffic fatalities particularly those associated with human error and increased political will to strengthen existing measures to reduce road carnage in Sub-Sahara Africa.

Keywords: Fatalities, fatality rate, road traffic, enforcement, countermeasures, Sub-Sahara Africa

1.0 Introduction:

Globally, road traffic crashes are a major public health problem. With increased motorization being strongly associated with economic development, the number of traffic crashes and casualties is set to rise. For instance, in 2011, 75 million cars were sold across the globe, bringing the total number of vehicles on the road to approximately 1 billion (UN/UNECE, 2012). This is expected to double by 2020, with a large proportion of these vehicles operating on the roads in developing countries. Put in the context of world road safety statistics, however, 1.3 million are killed and 50 million more are injured every year in road crashes. Projections indicate that global road fatalities will increase by more than 65% between the years 2000 – 2020, and road crashes will be the sixth leading cause of death and the second leading cause of disability-adjusted life years in developing countries in 2020 (Kopiths and Cropper, 2005; Murray and Lopez, 1996).

Developing countries account for more than 85% of all road traffic deaths in the world (Ameratunga et al, 2006). The upsurge in the number of vehicles per inhabitant is expected to result in an 80% increase in mortality rates between 2000 and 2020 (Peden et al, 2004). Sub-Sahara Africa is a region with the worst death rate from road crashes. For instance, close to 1,000,000 people are killed in the region every year with fatality rate of 28 deaths

per 100,000 population or 100 deaths per 10,000 vehicles (Winnet, 2007). Worst still, road crashes are the second highest cause of deaths for the 15 to 44 years age group in Sub-Saharan Africa, and the economic costs is estimated at \$10 billion annually or 2% of GNP (CGRS, 2006). On the average, more than 65% of the road crash victims in Kenya, Nigeria and Ghana are between the ages of 15-50 years (Odero et al, 2003; Ipingbemi, 2008; Amegashie, 2007). Unless immediate actions are taken, road fatalities in Sub-Saharan Africa will increase by 80% by 2020 (Peden et al, 2004).

The injuries and deaths resulting from road crashes have immeasurable impacts on the affected families whose lives often changed irrevocably by these tragedies, and on the communities in which these people lived and worked. Economically disadvantaged families are worst hit by the direct medical costs, and indirect costs such as lost wages resulting from these injuries. At the national level, road crashes slow down economic development and perpetuate poverty (WHO, 2013). It is in the light of the above that the paper assesses the problem of road traffic fatalities in Sub-Saharan Africa and evaluated counter measures against road traffic fatalities in selected countries in the region. This introduction is followed in section two by road traffic fatalities in Sub-Saharan Africa. Section three discusses the methodology adopted for this study while evaluation of measures

implemented to ameliorate road traffic fatalities are contained in section four. Conclusion is in the last section.

2.0 Road Traffic Fatalities in Sub Sahara Africa

Data on trend of road traffic fatality in Sub-Sahara Africa is very difficult to come by due to poor records and the little importance attached to data in the region. However, road fatalities in most of the countries in Sub-Sahara Africa are on the increase. For instance, fatality from road traffic injuries in Kenya was estimated to have increased by 430% between 1965 and 1998 (Odero and Kibosia, 2003). Similarly, in Botswana, mortality attributed to road crashes increased between 1975 and 1978 by 384% (Mock et al, 2003). The same increase was observed in Tanzania as road fatality increased by 64% between 1990 and 2000 (Museru et al, 2003). In Nigeria, between 1960 and 2000, road fatalities increased by 630% and injury by 120% (Ipingbemi, 2010). In Ghana, there was an increase of 65.3% of reported number of road fatalities between 1994 and 1998 (Afukaar, 2003). However, the percentage change decreased by 15% between 2001 and 2005 (Appiah, 2007).

In the same vein, crash fatality rate (road death/100,000 population) has also increased dramatically in most countries in Sub-Sahara Africa. Table 1 shows the trend of fatality rates in selected countries in the region between 1999 and 2010.

Data in columns 2 and 3 are based on reported cases of road deaths per 100,000 population for 1999 and 2010 in the selected countries. Column 4 showed changed in reported fatality rates between 1999 and 2010. Data in column 5 is based on modelled estimate of road fatality computed by the World Health Organization, taking into consideration the problem of under-reporting and adjusted 30-day fatality definition (World Health Organization, 2013). Based on reported cases, countries such as Angola and Sierra Leone had more than 100% increase in road fatality rate between 1999 and 2010. Tanzania, Ethiopia and Uganda (all in East Africa) had a lower increase in fatality rate between the period of analysis. However, Nigeria, Botswana, Namibia and Kenya recorded reduction in their fatality rates between 1999 and 2010. For instance, Nigeria had more than 50% reduction in fatality rate between 1999 and 2010 while Botswana fatality rate decreased by 30.5%, Namibia 17.6% and Kenya, 20.2%.

Furthermore, comparing the percentage difference between reported cases of fatality rate and modelled estimate for 2010, all countries under review had a higher fatality rate based on modelled estimate compared to reported cases (see Table 1). For instance, Nigeria had the highest percentage change difference (1196.2%) between reported cases and modelled estimate. Only Botswana and Angola experienced less than 50% change in fatality rates. Other selected countries

had between 100% and more than 400% change in fatality rate difference between reported cases and modelled estimate. The implications of this is that the higher the level of percentage difference between reported cases of fatality rate and the modelled estimate, the greater the level of under-reporting and the poorer the definition of fatality in such countries. In other words, road crash data are poorly collected and improperly recorded or

documented. For instance, the over 1000% percentage change difference recorded for Nigeria is a reflection of the extremely poor road crash data collection and recording system in the country as well as improper definition of fatality. However, in countries such as Botswana and Angola where there is small percentage difference in fatality rates between reported cases and modelled estimate, road crash data are better collected and managed.

Table 1: Fatality Rate in Selected Countries in Sub-Sahara Africa

Country	Fatality Rate (1999) (Reported)	Fatality Rate (2010) Reported	% change in Fatality Rate between 1999 and 2010 (Reported)	Fatality Rate (2010) (Modelled)	% Change between Reported and Modelled Fatality Rate (2010)
Botswana	28.5	19.8	-30.5	20.8	5.0
Namibia	11.9	9.8	-17.6	25.0	155.1
Kenya	9.4	7.5	-20.2	20.9	178.7
Malawi	3.6	6.5	80.6	19.5	200
Angola	6.6	16.3	146.9	23.1	41.7
Uganda	6.5	8.8	35.4	28.9	228.4
Ghana	6.6	8.1	22.7	22.2	174.1
Tanzania	7.5	7.9	5.3	22.7	187.3
Nigeria	5.5	2.6	-52.7	33.7	1196.2
Ethiopia	2.7	3.1	14.8	17.6	467.7
S/Leone	1.5	4.7	213	22.6	380.85

Sources: Column 2 (Extracted from World Road Statistics, 2006) Column 3 (Author's calculation from WHO, 2013); Column 4 (Author's calculation from

columns 2-3); 5 (Extracted from WHO 2013) 6 (Author's calculation from columns 3 and 5).

With respect to the causes of road crashes in the region, a number of risk factors contribute to traffic crashes and the resulting human casualties. Human factors, including road user behaviour and incapacitation, are the most common factors, accounting for more than 85% of all traffic crashes (Odero et al, 2003). Human error has been singled out as the most important factor in road crash causation in Sub-Saharan Africa. For instance, 75% of the road crashes in Tanzania was traceable to human error (Barengo et al, 2006). Similarly, about 84% of road crashes in Kenya between 1994 and 2004 was a result of human behaviour (Magolo and Mitullah, 2007). Asrat (2007) also found in Ethiopia in 2005 that 81% of road crashes was due to drivers' error while that of Senegal was put at 80% (Sarr and Sagna, 2010). In Nigeria, human error contributes significantly to road crashes in the country. Oyeyemi (2002) showed that out of the total of 248 road mishaps that occurred in the Federal Capital Territory (FCT) in 2001, human errors accounted for 86% of the cases. Some of the components of human errors include poor driving skill, over-speeding, alcohol intake and non-compliance with road safety laws such as failure to use crash helmets and safety belts.

Poor driving skills resulting from low level of education and shoddy licensing procedures are a major contributing factor to road deaths in the region. For instance, in Ghana, 43% of the drivers obtained

their licenses without a test (Abane, 1994). Similar deficiencies in driver' licensing procedures have also been reported in Botswana and Nigeria (Oladiran and Pheko, 1995; Oluwadiya et al, 2009). Jagongo (2012) observed in Kenya that several PSV (Public Service Vehicle) and commercial vehicle drivers were found to be operating on fake licences. Many of them obtained their licences illegally through corrupt means and therefore lacked knowledge of Highway Code and relevant traffic laws. Furthermore, in a survey of selected Sub-Saharan African cities, 17% of the drivers did not hold a driver's licence and 35% of the vehicles were without registration documents (Olvera et al, 2010). Even worse, only 37% of the drivers had at least two of the seven required administrative documents and only 40% had three.

Speeding is a major road safety problem in Sub-Saharan African countries. Faster driving speeds increase the likelihood of crash occurring and the severity of the crash consequences. In countries such as Ghana, Kenya and Tanzania over-speeding has been found to be a major contributing factor in fatal crashes (Afukaar, 2003; Odero, et al 2003; Barengo et al 2006). Excessive speed and hazardous overtaking were the main causes of road crashes along Yaoundé-Douala (Cameroon) road section in 2010 (Sobngwi-Tambekou et al, 2011).

Alcohol intake increases the risk of being involved in a crash as well as the severity of resulting injuries. Majority of adult

drivers are impaired at Blood Alcohol Concentration (BAC) of 0.05g/dl, while at a BAC level of 0.01g/dl the crash risk is approximately four times higher than that of someone with a BAC level of zero (Zador, 1991). Drunk driving is still a major problem among drivers in Sub-Saharan African countries though the required instrument (equipment) for its measurement is not widespread in the region. Odero et al (2003) and Ezengwu and Ezengwu (2007) found in Kenya and Nigeria respectively that alcohol influence accounted for 40% of driver related injuries and 50% fatalities.

Non-compliance with the use of seat belts and crash helmets escalates the impact of road injuries and fatalities. Studies in some Sub-Saharan African countries have reported low level of usage of both seat belt and crash helmet (Iribhogbe and Osime, 2010; Sangowawa et al, 2010; Oluwadiya et al, 2009; Galukande et al, 2009); in spite of the documented evidences of their safety benefits (Blincoe et al, 2000). In Ghana, for example, only 18% of drivers wore seat belt and 34% of motorcycle riders put on crash helmet in 2009 (WHO, 2013). Forjuoh (2003) identified poor enforcement of existing laws on seat belt as a major contributing factor to its low usage.

Furthermore, post-crash management initiatives that should reduce the extent of injuries and fatalities are yet to be fully developed in many countries in the region. Many road crash victims still die or are permanently disabled because they do not

receive prompt and adequate trauma care after crash. Mock et al (2003) noted in developing countries that formal emergency services were non-existent or were not accessible to majority of the population and some countries do not have functional ambulances in urban and rural areas. This implies that surviving road crash victims will have to rely on the help provided by other road users in order to be transported to hospital. For instance in Kenya, only 2.9% of the road crash victims were transported to hospital by ambulance (Peden et al, 2004). However, recent study in Kenya found that the percentage had dropped to 1.4% and only 51.9% reached health facilities within 30 minutes of crash (Macharia et al, 2009). Pre-hospital care must be followed with prompt and quality service at the hospital. Unfortunately, most hospitals in Sub-Saharan African countries are not equipped enough to be able to cope with emergency and trauma care. Nantulya and Muli-Musimbe (2001) found in Kenya that only 40% of the hospitals were prepared to treat trauma patients and almost none of the standard treatment items for managing severe injuries were found in government health facilities.

While road crashes in the region have been attributed mainly to human errors, other risk factors such as deplorable conditions of roads and vehicles are increasingly becoming important (Barengo et al, 2006; Sarr and Sagna 2010).

3.0 Methodology

Data on fatality rate for 1999 was extracted from 2006 World Road Statistics and this data form the base year for the study. Data on modelled fatality rate for 2010 was sourced from a 2013 World Health organization publication . This provided the basis for comparing reported data on fatality rate with modelled data. Thus giving an idea of the level of under-reporting of road traffic fatality in selected countries. Economic base evaluation methods such as Cost-Benefit Analysis (CBA) and Cost Effectiveness Analysis (CEA) form the basis for evaluating the countermeasures by different authors. In this regard, outcomes were weighed against the incidence over time (i.e. from inception to the time of evaluation, whether they were able to reduce road fatality or not). Descriptive statistic was used for data analysis.

4.0 Evaluation of Counter Measures against Road Traffic Fatalities in Sub Saharan Africa.

Some countries in Sub-Sahara Africa have put a coordinated approach in place to reduce the level of carnage in the region. Though many of these countries still rely on the traditional road safety campaigns and enlightenment programmes which have been found to have limited success (Dupperrex et al, 2002) or engage in ad-hoc initiative which is also less effective.

Most of the road safety intervention in the region is in the areas of education, engineering and enforcement. Enforcement needs to go on simultaneously with education. A no-nonsense approach has proven to be successful internationally. However, to make enforcement successful all sectors have to work optimally and hand in hand. With respect to engineering measures, Ghana is a good example where a simple engineering design that utilized speed bumps and rumble stripes to control speed led to a fatality reduction of 55% (Afukaar, 2003). Similarly, road infrastructure for pedestrians are components of road safety and are often prioritized by the governments in some Sub-Sahara African countries. One program in Uganda constructed an overpass across a busy highway (Kobushingye et al, 2001). An evaluation of this program showed that it reduced crash fatality from 8 to 2 cases around the overpass (Mutto et al, 2002). Road safety education for both motorists and pedestrians is an effective measure to reduce road carnage. For instance, Ghana government launched an information campaign using TV programme to educate professional drivers and to promote road safety (Blantari et al, 2005). An evaluation of this programme showed that it had reasonable coverage, clarity and was acceptable from the target population view point (Chen, 2009). Also, a pre-hospital management training programme in Ghana reported a positive outcome for a post-crash management

initiative (Mock et al, 2002). After taking the course, trained drivers reported considerable improvement in the type of first aid they provided. For example, the percentage of drivers who provided crash scene management increased from 7% before to 33% after the course. In Tanzania, a study has shown that trauma training courses are an effective way to improve the knowledge and the performances of training surgeons (Bergman et al, 2008). Trauma team performance was adjudged excellent when assessed with a novel trauma simulation assessment tool. Similarly, the Institute of Education through its Road Safety Education (RSE) programme implemented road safety education in some primary and secondary schools in Tanzania to enlightening school children about the need to be safety conscious (Komba, 2006).

In Nigeria, the road safety lead agency, the Federal Road Safety Commission (FRSC) has intensified road safety campaigns and awareness programmes in the last few years especially during the months preceding festive periods. The 'Ember Months' programme takes place between September and December every year. The commission believes that there is an increased traffic during this period which must be equally matched with improved road safety campaigns. Also, the commission has intensified road safety education on seat belt use and crash helmet wearing because compliance is still low (Sangowawa et al 2010;

Oluwadiya et al 2009). The low level of compliance is not surprising because road safety awareness and enlightenment programmes have been found to have limited success if not complemented with enforcement (Dupperrex et al, 2002).

Enforcement programmes are designed to make road users comply with traffic laws. Several countries in Sub-Sahara Africa have instituted laws limiting or banning the importation of old vehicles, but the implementation of these laws have been proved to be difficult, and often delay due to many interests involved (Chen, 2009). In Senegal for example, a law was promulgated in 2001 banning the importation of cars that were older than 5 years and trucks that were more than ten years. But the implementation of the law did not commence until 2 years after (Lagarde, 2007). In the same vein, the introduction of 'Route des Niayer' at the black spots in Dakar (Senegal) region, reduced fatalities by 50% between 2000 and 2007 (Sarr and Sagna, 2010). In Uganda, increased police enforcement on four major highways leading to Kamapla has been found to reduce monthly crash deaths by 17% between January to December, 2005 (Bishai et al, 2008).

In spite of the efforts of governments in various Sub-Saharan African countries to promote road safety through these initiatives, the level of carnage in the region is still unacceptable. Some of these programmes may probably not have achieved the desired objective due in part to poor coordination, lack of political will,

under-funding as well as poor and inadequate road crash data collection for effective road safety planning.

5.0 Recommendations and Conclusion

Road traffic deaths data showed a mixed result in Sub-Sahara Africa. In countries such as Angola and Sierra-Leone, fatalities increased more than 100% and 200% respectively between 1999 and 2010. However, fatality rate in countries such as Botswana, Namibia and Nigeria dropped during the period under review. Estimates based on modelled data and reported cases of fatality rate showed a wide disparity in all selected countries in Sub-Sahara Africa, which is indicative of prevalent under reporting of road crashes in the region. Also, human error accounted for more than 70% of the cause of road crashes in the region. An evaluation of road safety measures adopted to ameliorate the road carnage in these countries showed a modest achievement.

It is in view of the above that the study recommends the need to put in place appropriate road safety policies to stem road traffic fatalities in counties such as Malawi and Angola where road deaths due to road crashes are increasing. Such policies should include legislation on the use of seat belt, speed limit and alcohol intake. Enforcement of these measures has proved beneficial in developed countries of the world (Ameratunga et al 2006). Furthermore, there is need for

appropriate documentation of road safety data to reduce the discrepancy between reported cases of road traffic fatalities and modelled data. This will reduce under-reporting and help to effectively track progress made in road safety in the region. In order to achieve success in any measures adopted, they must be designed with consideration for the peculiar nature of road crashes in Sub-Sahara Africa. This is in agreement with the view of Nantulya and Reich (2002) who noted that for road safety policies to be effective in developing countries, they must be based on local evidence and research that are designed for the particular social, political and economic circumstances found in developing countries. In other words, importing road safety solutions from developed countries without local adaptation may not work. It is therefore imperative to look inward and develop strategies that will provide an 'African solution to an African problem'.

In conclusion, it has been established from the foregoing that road crash fatalities in Sub-Saharan Africa are on the increase. Based on both the reported cases and modelled estimate, fatality rates in most of the countries in Sub-Saharan Africa increased tremendously over the years. Various programmes put in place by different countries to stem the rate of road traffic casualties recorded only a modest achievement. It is therefore imperative for governments in Sub-Saharan Africa to explore further areas of intervention such as legislation and enforcement in order to

bring down the level of carnage on the roads in the region.

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