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Road safety in Nigeria: unravelling the challenges, measures, and strategies for improvement

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Abstract

Stakeholders play a crucial role in ensuring the smooth design and implementation of policies worldwide. This research presents the results of three focus groups carried out with stakeholders from different transport ministries and agencies involved in road safety in Nigeria. It aimed to understand their perception of road safety in Nigeria through discussing the road safety situation, measures, and strategies for improvement. Results showed that poor road design, organisation and implementation of road safety legislation, road user behaviour and inadequate research were impeding the improvement of road safety in Nigeria. Amongst the road safety measures discussed, public education and information campaigns were rated by each stakeholder group as very effective and easy to implement despite this not being supported by the wider literature. However, there were some variations in perception regarding the effectiveness of measures such as traffic control, road design and maintenance. Improving the road safety situation in Nigeria would require more concerted effort and an overall system-based policy reform involving both government and road users. The results of this study will contribute to and provide research evidence-based recommendations needed to design and develop integrated road safety policies and sustainable implementation strategies in Nigeria and other developing countries.

Keywords: road safety, developing countries, road safety measures, Nigeria, qualitative study

Introduction

Road traffic crashes (RTCs) are among the leading causes of death, disability and property loss worldwide with Low- and Middle-Income Countries (LMICs) accounting for 13% of these deaths despite only having 1% of the world's registered vehicles (WHO, 2018). Recent economic growth has resulted in an unplanned increase in motorized vehicles using largely inadequate infrastructure not designed to deal with the increased traffic demands; in addition, public transport systems are generally underdeveloped and financial and human resources for effective road traffic and safety management are inadequate. Road transport is the primary means of transportation in Nigeria, as it accounts for an estimated 80% of all traffic (NBS, 2020). Vehicle composition includes four wheelers [57.4%] and powered two- and three-wheelers [12%] (WHO, 2018). The public transport system where modes such as buses (mini and micro), taxis, autorickshaws and motorcycles are commonly used (Okoko, 2006) is neither well developed nor organised (Ojekunle, 2014). Most of the vehicles are often not road worthy and increase traffic volume on highways causing congestion, crashes and other related externalities (Fadare and Wojuade, 2007). This has contributed to more people using their private vehicles. In recent times, technological advances are increasingly being adopted and used in improving public transport systems in most big cities in the United States, China and Germany (Chen et al. 2020). Research has shown that the population is accepting of these systems based on their perceived benefits (Alonso et al., 2021). This is not the case in most developing countries including Nigeria. Most service operations such as ticketing, and fare payment are yet to be digitalised as no form of technology has been integrated into these operations. The private taxis such as uber, taxify and bolt which use technology in operation are better planned and organised but may not be affordable for low-income earners. Generally, road traffic crashes cost most countries 3% of their gross domestic product (WHO, 2018) and, according to the World Bank, reducing road traffic injuries by half could translate into an additional 15% to 22% of GDP per capita income growth over 24 years (World Bank, 2017).

Nigeria's road traffic fatality rate remains among the highest in the world at an estimated 21.4 crashes per 100,000 population compared to the world average of 18.2 (WHO, 2018). This is despite having one of the few outstanding, recognised, and dedicated lead road safety agencies in sub-Sahara Africa (World Bank, 2020). In 2019, 5483 people lost their lives and 35,981 persons were injured as a result of speed violations (44.1%), loss of control (11.7%) and dangerous driving (8.2%). These including distractions, alcohol consumption and drug use have been reported as major risk factors of road crashes in other countries like Cameroon and India (Zogo et al. 2021; Singh, 2017).

Overview of road safety management and policies in Nigeria

The FRSC is the lead road safety agency in Nigeria and regulates, enforces, and coordinates all road traffic and safety management activities through public enlightenment, promotion of stakeholders' cooperation, data management, vehicle administration, rescue services and patrol operation. In collaboration with other Federal Government Ministries and agencies, such as the Federal Ministry of Transport, Federal Ministry of Works and Housing, Vehicle Inspection Officers (VIOs), Federal Road Maintenance Agency (FERMA), and the Nigeria Police Force (NPF), the FRSC has established key response strategies to road safety (see Table 1).

Table 1: Different government agencies and their roles in road safety management (6 source NRSS, 2013)

Key activites	FG	SGs	LGs	FRSC	FERMA	VIO	NGOs/ PS	NPF
Policies and legal framework	✓		✓		✓		✓	
Road traffic Management and control		✓		✓		✓		

Construstruction and management of roads	✓		✓					
Maintenance of Roads	✓		✓		✓			✓
Road safety audits and assessment	✓		✓		✓		✓	
Enforcement of Traffic Laws		✓		✓		✓		
Prosecution of offenders		✓		✓		✓		
Vehicle inspection and certification				✓			✓	
Driver Testing & Licensing		✓			✓			✓
Certification of Driving Schools		✓			✓			
Awareness and Advocacy	✓		✓		✓		✓	
Collection of Data & Investigation	✓		✓		✓		✓	
Funding	✓		✓		✓			
Provision of post-crash services	✓		✓			✓		

FG – refers to all Ministries, Departments and Agencies (MDAs) of the Federal Government with the exception FRSC, NPF and FERMA; SGs - this refers to state governments and includes state traffic management agencies, state road maintenance agencies and state ambulance services ; PS - Private Sector

Following the declaration of the period 2011-2020 as a Decade of Action for road safety by the United Nations (2011), the Federal Government launched a road safety plan – the Nigerian Road Safety Strategy (NRSS I) for 2014-2018 and the subsequent NRSS II for 2021-2030 (NRSS II, 2020), launched in December 2020. The NRSS sums up Nigeria's response to the Decade of Action and provides a clear direction towards achieving the vision for road safety – "a country where road crashes result in no death" (NRSS, 2013). The first strategy aimed at achieving a 35% reduction in RTCs by the year 2018 using year 2012 statistics as a baseline. Figure 1 shows the trend of RTCs between 2012 and 2019. While the numbers started reducing from 2014, the years 2018 and 2019 recorded some increase in the numbers. According to Olagunju (2018), by June 2018, only about 57% of the initiatives set in NRSS I were accomplished, and this affected the realisation of the overall goal of the strategy including RTC reduction. Only a 20% reduction in RTC was achieved. Currently, NRSS II (2021-2030) has been launched and the purpose is to improve on the achievements of NRSS I.

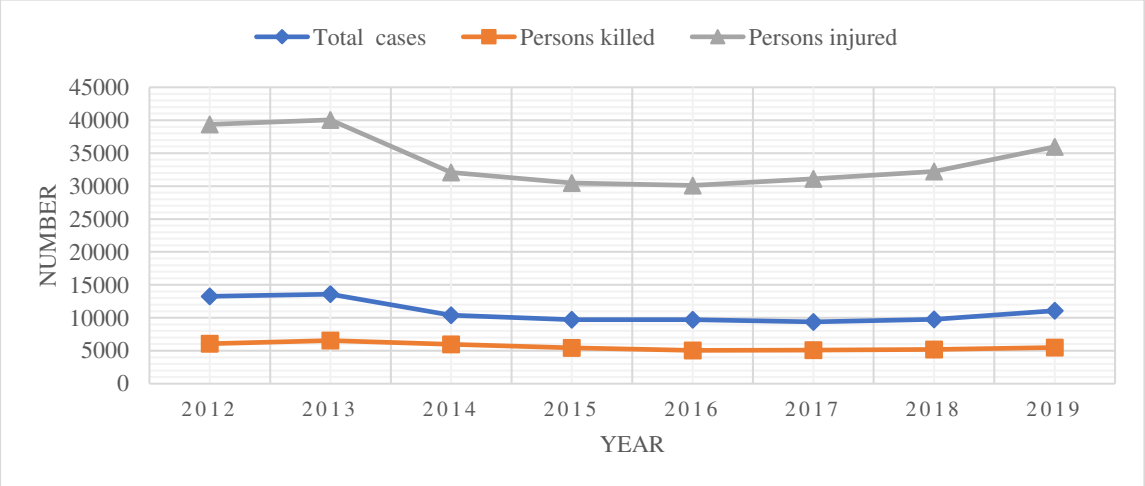

Figure 1: Road traffic crashes in Nigeria from 2012-2019 (FRSC, 2020; NBS, 2020)

The current study

This study aims to provide an understanding of stakeholders' perception of road safety in Nigeria by discussing the road safety situation, measures, and strategies for improvement. Focus groups

explored the opinions of stakeholders from different government ministries and agencies in Nigeria involved in road safety. During the discussions, quantitative questions were included to summarize some aspects of the qualitative findings. This approach was anticipated to lead to more meaningful explanations of the road safety standards in the country. To the knowledge of the authors, this is the first study to have utilized the qualitative method carried out with relevant stakeholders to understand road safety in Nigeria. As well as highlighting potential strategies for improvement, recommendations made could help strengthen the implementation of road safety measures and consequently improve road safety in Nigeria.

Methodology

Participants

Ethical approval was obtained from the University of Leeds Research Ethics Committee (Ref: AREA 18-019**)**. Three focus groups were conducted with participants from the FRSC, VIO and related Federal Government Ministries of Works and Transport (FMWT). The Federal Ministries of Works and Transport are two separate ministries but have been combined in this study to improve understanding and ease discussion. The officials were selected based on their experience, knowledge and involvement in road safety-related activities and projects in the country. A total of 25 stakeholders participated (8-9 participants per group), consisting of 20 males and 5 females (see Table 2) and each focus group lasted approximately ninety minutes.

Table 2: Demographic characteristics of different organisations

Organisations	**Age (range)**	**Gender**	**Years of Experience (mean)**
Vehicle Inspection Officers (VIO)	38-55	7 males, 1 female	14
Federal Road Safety Corps (FRSC)	45-60	6 males, 2 females	22
Federal Ministry of Works and Transport (FMWT)	40-58	6 males, 3 females	18

Procedure

The focus groups were conducted at different locations in Nigeria between December 2018 and May 2019. On arrival, participants were given an information sheet and encouraged to raise any queries. They were assured of confidentiality of their responses which would be anonymized, and they provided their consent. Three researchers and three facilitators were involved in the planning, interviewing, transcribing and coding, identifying themes and summarising the results which took approximately 110 person- hours.

Discussion guide

The focus groups followed a semi-structured format of open-ended questions which began with basic questions about the road safety situation and measures operational in Nigeria and their perceived effectiveness and ease of implementation. Questions about the share of responsibility between government bodies involved in road safety and how they collaborate to improve the transport situation of the country were also asked. The focus groups were concluded with discussions about steps that could be taken to improve the status of road safety in Nigeria.

Participants were also presented with a list of eight road safety measures (adapted from Elvik et al., 2009) and asked to rate their perceived effectiveness and ease of implementation of each measure.

i. Road design
ii. Road maintenance

iii. Traffic control
iv. Vehicle inspection
v. Driver education and training
vi. Public education and information campaigns
vii. Legislation and enforcement of traffic regulations
viii. Post-crash care

The purpose of this exercise was to understand where the major conflicts were between what participants believed should be done and what they felt capable of doing. For the perceived effectiveness of a measure, the rating scale used ranged from very ineffective (1) to very effective (3) and perceived ease of implementation ranged from very difficult (1) to very easy (3). The scales were used to rate which measures have been perceived to be effective and easy to implement in the country considering all available resources including contribution to crash reduction. The average ratings of each measure were calculated and summarised, and the ratings for effectiveness was plotted against ratings for ease of implementation during the focus groups. Based on the results, more discussion about these measures followed. Similar methods have been used in past studies (Hull &Tricker, 2005; Marsden et al., 2006) to prioritize different transport indicators. Such tools are particularly useful to help separate out differences within an overarching topic area like 'road safety' and to enable the researcher to explore these differences within the focus group discussions. In this case, it also enabled differences between organisations to be explored.

Analysis

Data from the focus groups were transcribed by converting them verbatim into written text and removing any identifying details. Observations (e.g., sounds, pauses, and other audible behaviours) were also transcribed. The transcribed data were coded by grouping participants' responses into different themes (road safety situation, measures, and strategies for improvement). Data were analysed using Deductive Content Analysis (DCA) as the list of coding categories was generated from findings from previous phases of the research project which formed part of the questions. The quantitative ratings generated from the scale of perceived effectiveness and ease of implementation of the road safety measures were also collated and discussed.

Results and Discussion

Analysis of the focus groups led to several explanations or combinations of explanations for road safety in Nigeria under the different themes, elicited from the questions asked during the study. The broad themes were road safety situation, measures and strategies for improvement. These were further sub-divided into subthemes. There were some similarities and differences in opinion between different organisations and this formed part of the discussion presented below.

Road safety situation

Road engineering and infrastructure

Consistent with Okigbo, 2012 and Farouq, et al., 2017, participants stated that lack of funding, poor road design and maintenance of existing roads and inadequate infrastructure increases the risk of road traffic injuries in Nigeria. Akinyemi (1986) attributed the poor state of Nigerian roads to bureaucracy and inattention to preventive maintenance projects.

> *The problem is funding, the current budget is not enough to cover most of these projects…These projects are capital intensive, and we do everything we can to prioritize projects based on the level of attention needed (FMWT)*

In addition, the infrastructural needs of pedestrians and cyclists are not considered in road designs. Little or no effort is made to separate the motorized from the non-motorized as different categories

of road users share the same road space. Some pedestrian facilities such as bridges can be seen in some parts of the country but most of them are under-utilized because they were poorly designed and not sited in the appropriate places.

> *Most of the roads are constructed to ease traffic rather than to improve safety, I don't think safety of road users especially the pedestrians and cyclists are considered in most road construction projects in Nigeria (VIO)*

However, participants were also of the opinion that, when provided, pedestrians do not make appropriate use of these facilities.

> *People avoid using the pedestrian bridges and have even turned them to market sites. There are also security concerns on the use of the bridges at night as there have been reports and complaints about rape and robbery (FRSC)*

This corroborates research by Alonso et al. (2021) and Uzondu et al. (2020) which shows that roads in most developing countries lack necessary infrastructures, and the existing ones are substandard as they lack current technological. In Nigeria, for example, this includes adequate road signs and markings and pedestrian infrastructures which impacts directly on road safety. This lack of infrastructure may lead to behaviours that are not appropriate for the traffic situation.

Organisational and implementation problems

As the body primarily concerned with implementing road safety programmes in the country, FRSC collaborates with other agencies and ministries to evaluate current procedures needed to generate information that forms the core of its programs of enhancing road safety. Despite this, lack of timely implementation which could be because of improper coordination between the various agencies reduces the effectiveness of some projects. This finding is similar with Odeleye (2000).

> *There should be more collaboration and harmonisation between the agencies and government ministries…. Some activities performed by different agencies and ministries appear to overlap resulting in conflicts (FRSC)*

Additionally, due to lack of evaluation and monitoring of various road safety programmes and projects, most of these programmes phase out and therefore, it is very difficult to measure their impact on road safety.

> *We do not follow up on some of our programmes, for example, the road safety games, reflective armbands for school children. This is also the same with road projects (FRSC)*
> *We do not monitor our road projects and do not rehabilitate as at when due, road maintenance is very crucial and should form an integral part of any road project… (FMWT)*

Behavioural problems

Participants maintained that different categories of road users are usually involved in behaviours which are unsafe for them and others. Some of these unsafe behaviours, as well as factors mediating them, have been identified in past studies carried out in Nigeria (Olapoju, 2016; Uzondu et al., 2019) and other LMICs (WHO, 2018).

Speeding

Most of the participants cited speed and speed related problems as one of the most unsafe behaviours exhibited, especially by commercial drivers. The extent of this problem can be seen in the FRSC report (2020) showing its percentage contribution (44%) to traffic crashes in the country.

Most problems are from speed-related causes. But the blame will not be on the drivers alone. First of all, drivers need to know the different speed limits on different roads, but it is very unfortunate that speed limits are rarely posted, so drivers may not even know when they are going above the limits (FRSC)

Presently, there are no forms of enforcement of speed limits in the country, nothing at all (FMWT)

Vehicle standard and maintenance

Most vehicles on Nigerian roads are used vehicles imported from Europe or America, popularly known as "Tokunbo". Maintenance of these vehicles is poor as drivers do not undertake scheduled maintenance, until vehicles break down completely.

Drivers prefer to go through various shortcuts to boycott scheduled vehicle maintenance (VIO)

We all know that it is possible to get a vehicle license without proper checks… this is common practice (FMWT)

Alcohol and drugs

Driving under the influence of alcohol and drugs was noted as a gradually emerging cause of road traffic crashes in Nigeria. This calls for urgent intervention because of the number of offenders who have been apprehended recently and who tested positive to drugs and alcohol.

The FRSC introduced an emotional evaluation test for traffic offenders in the FCT. In the last year, about 6,000 offenders were arrested. Part of the test result showed that most of them were under the influence of drugs. The most pathetic thing is that most drugs they use are not expensive and can be obtained easily as they can go to any length to get "high" (intoxicated) including inhaling the gas from pit latrine/ toilet or soak away pits (FRSC)

Road encroachment

Another issue raised was encroachments on roads that give no adequate consideration to safety. Participants stated that this has created undue inconveniences for many road traffic operations. Pedestrian footpaths and roads are being encroached by traders and occupied by vehicles; this makes pedestrians resort to sharing road space with vehicles which is detrimental to their safety.

Trading in the middle of the road where the road which should be free for traffic is turned to a market… uncontrolled parking (usually trucks carrying petroleum products, containers and other heavy goods), encroachment of pedestrian footpaths (FRSC)

Class differences and discrimination

There is a general concern that law enforcement is not as strict as it should be, probably because of discrimination and unequal resource distribution in some parts of the country. This also applies to penalties and fines. Higher status, influential drivers, or drivers with relatives in top government positions are more likely to have their fines waived and avoid punishment.

The rich and those who are related to them sometimes get away with committing offences, this cannot contribute to improving road safety in any way. Everybody must receive the same punishment when they go against the law (VIO).

You wouldn't expect us to fine an offender in Abuja N10,000 and also charge another driver who has committed the same offence in the north the same amount…, there is no way they can pay it… (FRSC)

Participants highlighted that people are opposed to penalties and fines especially when it is not equally administered. Additionally, the reason for administering fines and penalties could also contribute to non-compliance. Alonso et al. (2017) has shown that most drivers believe that the reasons for sanctions (fines, penalties) is chastening (73%), tax collection (63.3%), and education of road users (58.8%). If citizens have a misconstrued view of the reasons for administering fines, compliance will not be well aligned with improving road safety.

Operational problems

Increasing motorisation and poor public transport system

Participants agreed that rapid urbanisation and associated increased motorisation has worsened the road safety situation in the country and as a result, the major urban areas are suffering from heavy traffic congestion and lack of regulation. Participants attributed this to lack of adequate and accessible public transport which has encouraged the majority of people to acquire personal vehicles.

Public transport is not well developed, as a result, people feel more comfortable travelling in their private vehicles (FRSC)

Driver licencing

According to the participants, even though progress has been made in developing comprehensive driver training programs and computerized licensing systems have been introduced, people still try to evade it through driving schools. In addition, many motorists do not go through the appropriate training and tests, and some do not have a driving licence.

26 driving schools have been suspended presently for trying to hack into the system to generate certificates for people who did not actually go through the training, they collect bribes from them to do these (FRSC)

Some drivers still do not drive with licence especially the commercial drivers. (VIO)

Research safety research and data

The FRSC uses a digitalized system whereby crash data is collected with computers and hand-held tablets at the scene of the crash and data goes directly into the FRSC data portal. Road safety personnel on patrol or those called to the scene via the toll-free emergency number, or any other means collect these data. The portal is designed to synchronize inputs from other agencies such as the VIO, police, and hospitals to avoid multiple entries. Despite this, participants maintained that there are still gaps as not all crash data are recorded, especially in places not regularly covered by FRSC and when crashes are not reported.

Unreported cases are also prevalent, where victims settle on their own without involving the Police. There is little or no working insurance plan in the country presently, so we do not get data from insurance companies (FRSC)

We have research departments, but we also know that the level of research we carry out is not adequate… we need to pay more attention to research because without proper research it will be very difficult to improve road safety (FMWT)

Road Safety Measures (perceived effectiveness and ease of implementation)

Considering that inadequate funding is a challenge in most LMICs, it is therefore very important to ensure that programmes aimed at reducing deaths and injuries are developed within the budget available. This requires knowledge of the effectiveness of road safety measures and a process to help prioritize them. Participants rated eight road safety measures (Table 3) based on their perceived effectiveness and ease of implementation in Nigeria. Results suggest that measures which were highly rated by different stakeholder groups, represent mainly their primary areas of responsibility. These are mostly measures with ratings between **fairly effective and very effective** combined with measures with ratings between **very difficult and fairly easy** (Figure 2, top left). For example, for the FRSC, it was public education and information campaigns, driver education etc.; for the VIO, it was vehicle inspection, legislation and enforcement of traffic regulation etc. and road maintenance, road design etc. for FMWT. Measures with ratings between **fairly effective and very effective** combined with measures with ratings between **very easy and fairly easy** (Figure 2, top right) dealt with mainly driver education, training and public education and information campaigns. Measures with ratings between **fairly effective and very ineffective** combined with ratings between **very difficult and fairly easy** (Figure 2, bottom left) represented mainly measures associated with infrastructure and vehicle inspection. None of the ratings was between **fairly effective and very ineffective** combined with ratings between **very easy and fairly easy** (Figure 2, bottom right). Additionally, different stakeholders were broadly in agreement for policy measures such as post-crash care, public education and information campaigns, and legislation and enforcement of traffic regulations (depicted in grey, purple and light green). There were disagreements in ease of implementation for driver education and road design (depicted in yellow and blue) and disagreement on effectiveness for road design, vehicle inspection, traffic control and road maintenance (depicted in blue, red, and dark green). These are discussed in more details in subsequent sections.

Road design

There were disagreements on effectiveness and ease of implementation between different stakeholder groups with regards road design. While the VIO and FMWT shared slightly similar opinions, this contrasted with that of the FRSC. This could be because the FRSC believes that a lot of effort is needed to include safety features in road design and maintenance and even though this is an effective means of improving road safety, lack of finance has been an impediment to achieving it.

It's difficult to get roads currently under construction to comply with safety measures, how then would one evaluate the effectiveness of road design to road safety if they are not properly designed. Including safety features in road design would usually cost more money but they are important, we save a lot by preventing crashes. (FRSC)

Road maintenance

Improvement of road infrastructure is mostly limited to minor black spot treatments which depend solely on the availability of funds. This was rated similarly to road design as participants stated that the challenges are similar.

> *FERMA is under the ministry of works, when safety features are not included in the initial road design, it becomes very difficult to do this after the roads have been constructed (FMWT)*

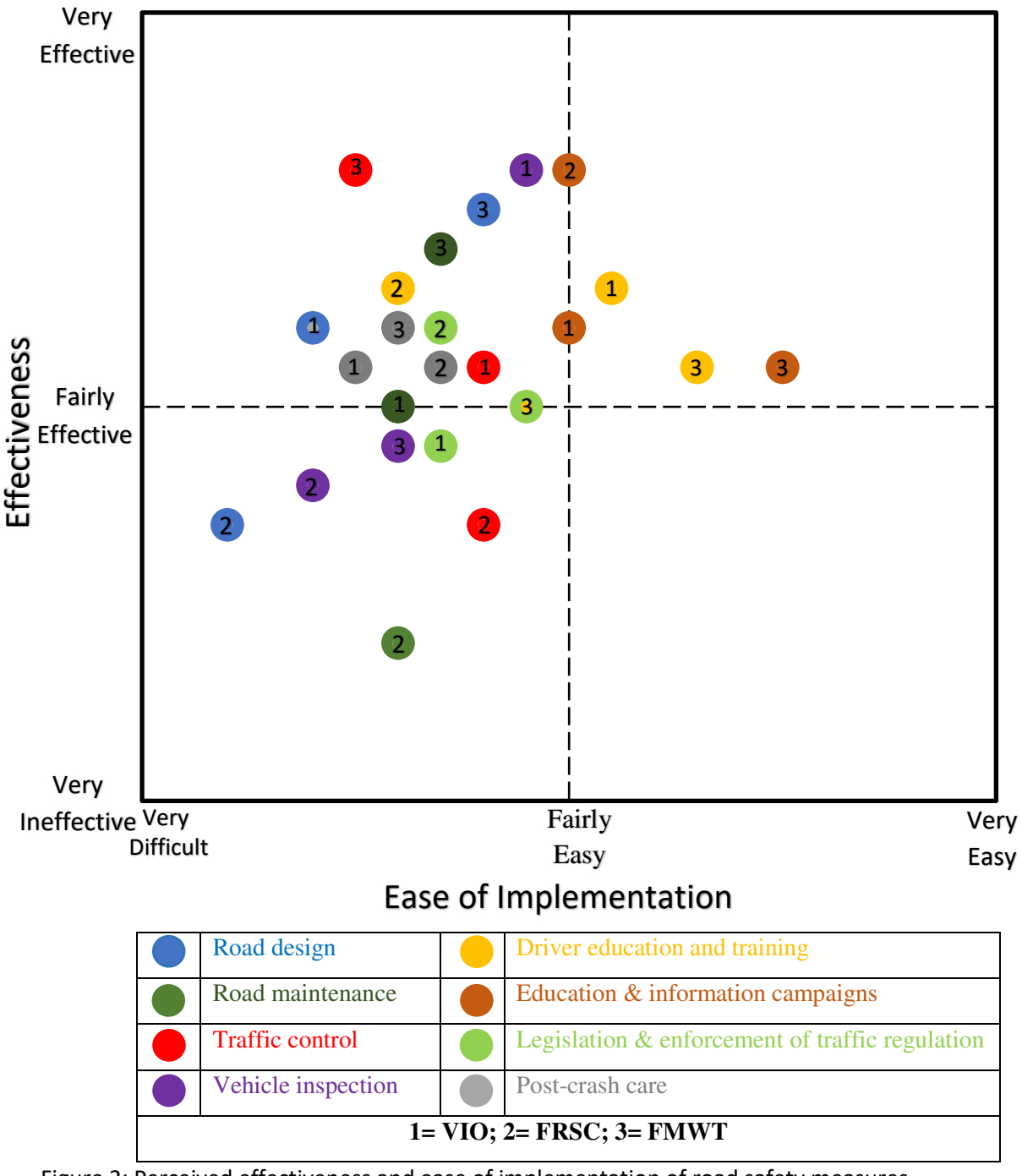

Figure 2: Perceived effectiveness and ease of implementation of road safety measures

Traffic control

Traffic control in Nigeria is the responsibility of the traffic wardens who work an average of 10hrs a day. As a result of the challenges associated with security and visibility at night, traffic wardens do not work late nights in Nigeria. The installation of traffic signals on some roads have taken care of this anomaly but drivers still find it difficult to obey traffic signals, the same way they disobey traffic wardens' directives. Participants agreed that it is difficult to implement but there were differences in perception regarding its effectiveness.

> *We try to do as much as we can with the limited resources, we hope that the ministry gets more funding to widen the scope of our work (FMWT).*

Vehicle inspection

Even though all participants rated this measure between very difficult and fairly easy to implement, FMWT and FRSC rated its effectiveness between fairly effective and very ineffective while the VIO rated it between very effective and fairly effective. According to participants, computerized vehicle inspection centres have been introduced in some states to check the roadworthiness of vehicles, but there is also the issue of inadequate skilled human resources required to expedite and adequately carry out these functions.

> *Vehicle inspection is under the VIO. For now, only Lagos and Abuja have electronic vehicle inspection centres, other states are beginning to sign on…Most vehicle inspection offices in the country do not have the adequate capacity and resources to do their duties (FRSC).*

Driver education and training

This was rated between very effective and fairly effective by all participants and corroborated Kosola et al. (2016), who highlighted the importance of driver education in improving driver behaviour. However, there was a slight difference in the rating for ease of implementation. While the VIO and FMWT rated it between fairly easy and very easy, the FRSC rated it between very difficult and fairly easy. The latter said it was because of the behavioural problems stated earlier.

> *We enlighten drivers by highlighting the importance of driving safely through various trainings but most of them do not practice what they learn (FRSC).*

Public education and information campaigns

All the participants rated this measure between very effective and fairly effective combined with fairly easy and very easy to implement, similar to findings from Phillips et al. (2011) and Adamos et al. (2013). According to them, it is cost-effective because some members of staff are already delegated to do this, and it does not involve additional cost or personnel.

> *Recently, the 253 commands across the country have been instructed to carry out one motor park [1]rally every day. We have an average number of 80 motor parks in each command, this will give a rough idea of the number of people we reach in a week. When we do this, we're able to talk to both drives and their passengers. (FRSC)*

[1] Motor parks are designated areas fixed by state or local governments where passengers go to board buses to their different destinations either within or outside their cities.

I can say that the FRSC is doing well in this area but most of these should be done through the radio as they will be able to reach a wider audience… most people listen to the radio (FMWT)

Even though stakeholders highlighted public education and information campaigns as an effective strategy in road safety, Bener et al. (2007) argues that educating people about the benefits of complying with traffic laws might help improve compliance rates but that if used alone, would not be enough to reduce crash rates. Education programmes should occur within an evidence-based holistic system, designed alongside other risk-reducing measures (af Wåhlberg, 2018). Bartl et al. (2002) suggest that in preparing education programmes, particular attention should be given to the messages being delivered.

Legislation and enforcement of traffic regulations

For this measure, there was a slight difference in the rating of effectiveness between groups, however they all shared similar opinions in the rating for ease of implementation. Participants expressed concern with the non-adherence of traffic rules by all road users and maintained that better enforcement of the rules would lead to more positive outcomes. This is similar to findings from Vasudevan et al. (2009) and van Schagen et al. (2016).

It is not easy to enforce traffic rules using traffic wardens, I think automated enforcement should be introduced in the country; it will take care of most of the challenges we encounter with traffic offenders (VIO)

Post-crash care

Participants provided similar ratings for this measure (Figure 2). Even though it is an effective measure, the challenges associated with its implementation are enormous. The FRSC has a toll-free emergency phone line (122) for incident reporting which is open on a 24/7 basis (29). On receipt of a call, the centre locates and deploys the patrol vehicle nearest to the crash scene. This is usually monitored and tracked at the call centre, which has nationwide coverage.

When the emergency numbers are called, we try to respond as quickly as we can. Giving first aid and subsequently taking the injured to the hospital. We have officials who have been trained to do this but instead of calling the emergency number, people would rather start recording videos and taking pictures. However, more experts with adequate skills are needed to handle the required equipment (FRSC).

Strategies for improvement

Awareness-raising

The FRSC has designed and implemented various public education programmes which cut across languages, cultures, and religious barriers. A recent change in the national curriculum has enabled road safety education modules to be added and become mandatory for primary and secondary schools.

Road safety has been introduced in school curriculum starting with primary schools. It was approved by the presidency and directed to be implemented by all state governments through the state ministries of Education. There are FRSC school clubs, NYSC road safety clubs, essay competition and a safety quiz competition in secondary schools which

rewards the first three schools. This is some sort of motivation for the schools and creates awareness of road safety (FRSC).

Road safety messages could be taken to clubs and bars where young people frequent to raise awareness especially about drunk-driving (VIO)

Other channels being explored include visiting churches, mosques, community outreaches with the help of traditional rulers, awareness raising through the social media.

Religious institutions are very good channels to deliver the road safety message in Nigeria, almost every family belongs to one (FMWT)

We have the community road safety initiative to train people on crash and rescue so that they know what to do if a crash happens (FRSC)

Additionally, past studies have shown considerable variability in the degree of effectiveness of the awareness-raising campaigns. Whilst their implementation may be beneficial, an enhanced safety effect may be observed with the addition of other road safety measures such as education programs and legislations (Stanton et al. 2016; Diegelmann et al. 2020).

Improved collaboration with stakeholders

While road safety has been recognized as a collective task, there is little collaboration among key stakeholders in Nigeria. According to the participants, efforts are being intensified to improve stakeholders' collaboration.

As regards data, we work mostly with the police, hospitals and ministry of health, National Bureau of Statistics (NBS), to harmonise data. There is an MOU with NPA (Nigerian Ports Authority) to implement minimum safety standards for trucks, there is also a safe to load programme for all tank farms in the country (FRSC).

Nigerian road safety strategy I and II (NRSS 2014- 2018, 2021-203)

The NRSS is a working plan set up to improve the state of road safety in Nigeria. It shows the targets and what the government is committed to achieve in road safety within a given time. Targets according to Marsden et al. (2009) set out the level of accomplishment that an organisation aims to achieve for a particular project within a given time frame. The policies and strategies laid down in the plan were based on the safe system approach and have been introduced to integrate various elements of road safety efforts into actualizing a safe motoring environment in Nigeria.

There is presently an inter-ministerial committee approved by the government, which is made up of the ministry of finance, transport, NNPD, FRSC etc. to work on the Nigerian National Road Safety Strategy, a lot is going on here and we are hoping that the outcomes would create a huge impact on road safety in the country (FRSC).

Conclusion and policy recommendations

Stakeholders play an important role in shaping the road safety practices and in setting up road safety regulations of a country (Tetali et al., 2013). Their opinion is highly valuable, especially where the country has a lead agency (WHO, 2018), such as Nigeria. This study provided an opportunity to actively engage the stakeholders, together with other agencies and ministries involved in road safety in the country, to explore their experiences in road safety in Nigeria over the years and to identify areas for improvement.

The findings revealed that there was a high degree of agreement among different stakeholder groups regarding the present situation of road safety in Nigeria. Participants seemed to know the problems and their contributory factors. For example, they stated that road safety-based projects are often impeded due to lack of collaboration between stakeholders, administrative formalities, behaviour of road users and inadequate road safety research and indicated how several local issues contribute to the highlighted problems and pose more serious barriers to improving the condition.

With respect to the ease of implementation of the various road safety measures discussed, almost every measure was rated difficult to implement. Some alignments and differences in perception were observed during the discussion that followed between groups regarding how they choose to manage the situation in relation to their overall organisation objectives. While the study established some links between institutional voids (irregular intervention/policies and political corruption) and structural challenges (infrastructural deficits and weak bureaucratic processes), it also revealed a range of issues relevant to multiple barriers which indicates that:

- The overarching environment is difficult perhaps due to inadequate funding
- Institutional strengths for delivering a systems approach is lacking
- Procedures used for design and development of policy instruments are poor
- There is a lack of importance placed on monitoring and evaluation of projects

In contrast, some policies such as public education and information campaigns, and post-crash care were viewed as easy to implement across all organisations. These measures are where tremendous progress has been made in terms of intensifying efforts to ensure that road users in different parts of the country have general knowledge of road safety. However, they seem to have a short-term effect because in the long run, there has been little success recorded (in terms of [1] positive public attitude and behaviour towards road safety and [2] crash reduction which is one of the major ways of assessing and evaluating the impact of road safety measures). Therefore, agreeing on policies is not enough to get alignment on delivery and even though there is good implementation of these measures from some of the agencies involved, it is not working well as results do not attest to this. It is crucial to understand the needs of both professionals and users so that measures developed will be targeted at specific needs and tailored in such a way that agencies involved will ensure that they are implemented.

Additionally, there was quite significant divergence on some other measures such as traffic control, road design and road maintenance. These measures are infrastructure based and capital intensive. Therefore, issues around the general lack of and/or inadequate finance could impede implementation and also the subsequent length of time it could take to measure their impacts. This corroborates report on the impediments and challenges to the implementation of the NRSS 1. (for more details see https://frsc.gov.ng/wp-content/uploads/2021/01/NRSS_2021-2030.pdf).

Regarding perceived effectiveness of the measures, the results showed that public education and information campaigns, post-crash care and driver education and training were rated as effective across different groups. On the other hand, each ministry/agency rated the measures which seem to be their responsibilities higher than others (for example vehicle inspection for the VIO, public education for the FRSC and traffic control and road design for the FMWT). This could suggest that they might have a common understanding of the range of the problems within and outside their roles, but do not share an understanding of what is most important and nor can they say what matters most even if the reasons are lack of funding, inadequate collaboration etc.

There has been over four decades of developing and setting up road safety policies, strategies, and measures in Nigeria. It would seem that there is currently no apparent effort to implement and monitor these policies as there have not been very significant changes especially in the road crash statistics. This could also be attributed to a combination of poor training, long-standing cultural issues regarding e.g., maintenance and enforcement and prioritisation of budgets which does not

pay due attention to safety. For example, whilst investment in road building programs has increased in recent years, many roads in Nigeria are currently being built and upgraded with little consideration of road safety infrastructure. For example, Sangowawa et al., (2012) found several locations in the southwestern region of Nigeria that lack traffic signs and Uzondu et al., (2018) conducted a traffic conflict study at different road locations in the eastern part of Nigeria and showed that most of the roads had little or no traffic control and traffic signals. This lack of infrastructure may lead to driving behaviours that are not appropriate for the traffic situation such as excessive speed and unsafe overtaking. This study shows that there is a broadly shared understanding of what needs to happen, therefore it requires greater political will and perhaps some institutional and professional reform to bring some of it about and improve road safety in Nigeria. Additionally, in Nigeria, drivers' behaviour which was broadly discussed during the focus group studies, may be attributed to the functionality of the traffic system. However, it is important to note that whilst there is an apparent over reliance on driver behaviour awareness, it is set within a context where there are acknowledged failings across the whole system which currently make a safe system approach difficult to implement. For example, while NRSS I was being implemented, WHO (2018) recorded Nigeria as having one of the highest crash rates (24.75 deaths/100,000 population) in Africa in 2017. NRSS I have expired and was not fully implemented, most of the targets set were not achieved. Only 2 out of 81 initiatives achieved 100% implementation while some were not implemented at all (5 out of 81). Some of the reasons stated for this level of achievement include institutional factors, politics, road user behaviour etc. This definitely calls for more concerted effort among all stakeholders involved in road safety in Nigeria.

Therefore, the result of this study shows that improving road safety in Nigeria would require an overall system-based policy reform involving both the government and road users. According to Almqvist & Hydén (1994), a successful safety programme involves actions in all the areas of education, health, information, enforcement, engineering and planning, which must complement and support each other. The goal is to have a functional system that, according to Gehlert et al. (2014), concerns the mobility and safety of the traffic environment. Therefore, it would be crucial that system-oriented reforms at different organisational levels complement plans to improve road user behaviour. These reforms would need to inform policy decisions which are primarily concerned with behaviour change in the population (2011). This is summarized in the safe system approach (2008) which acknowledges human errors and vulnerability and requires a holistic view of the road transport system, including the road environment, travel speeds, vehicles and road users. In addition, the options of star rating vehicles as proposed in the New Car Assessment Program (2017) are not currently being implemented in Nigeria. However, the annual assessment of vehicles for road worthiness should be strictly adhered to. The use of the International Road Assessment Program (2016) to star rate roads, and then accordingly, use enforcement and control of speeds (2013) appropriate for the different roads could help improve road safety in Nigeria.

Limitations and Future Research

A notable limitation in this study is that no focus group discussions were conducted with the stakeholders from NGOs, private establishments, health sector and the general public who may be involved in road safety as they would have provided some more information on the measures discussed in the study. It is suggested that future studies should involve these agencies so as to gain more understanding of their responsibilities and their views on road safety and general transportation management in Nigeria.

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