Journal of Health and Medical Sciences

Adebimpe, Wasiu O., Dabo, Daniel, Osifo, Joy A., Ibirongbe, Demilade, Gbahabo, Dooshima, and Adesina, Afusat. (2019), Knowledge of Road Signs and Attitude to Safety Measures Among Public Secondary School Students in Jos Nigeria. In: *Journal of Health and Medical Sciences*, Vol.2, No.4, 524-531.

ISSN 2622-7258

DOI: 10.31014/aior.1994.02.04.81

The online version of this article can be found at:
https://www.asianinstituteofresearch.org/

Published by:
The Asian Institute of Research

The Asian Institute of Research *Journal of Health and Medical Sciences* is a peer-reviewed International Journal. The journal covers scholarly articles in the fields of Medicine and Public Health, including medicine, surgery, ophthalmology, gynecology and obstetrics, psychiatry, anesthesia, pediatrics, orthopedics, microbiology, pathology and laboratory medicine, medical education, research methodology, forensic medicine, medical ethics, community medicine, public health, community health, behavioral health, health policy, health service, health education, health economics, medical ethics, health protection, environmental health, and equity in health. As the journal is Open Access, it ensures high visibility and the increase of citations for all research articles published. The *Journal of Health and Medical Sciences* aims to facilitate scholarly work on recent theoretical and practical aspects of Health and Medical Sciences.

ASIAN INSTITUTE OF RESEARCH
Connecting Scholars Worldwide

ASIAN INSTITUTE OF RESEARCH
Connecting Scholars Worldwide

The Asian Institute of Research
Journal of Health and Medical Sciences
Vol.2, No.4, 2019: 524-531
ISSN 2622-7258

DOI: 10.31014/aior.1994.02.04.81

Knowledge of Road Signs and Attitude to Safety Measures Among Public Secondary School Students in Jos Nigeria

Wasiu O. Adebimpe[1], Daniel Dabo[2], Joy A. Osifo[1], Demilade Ibirongbe[1], Dooshima Gbahabo[3], Afusat Adesina[4]

[1] Department of Community Medicine, University of Medical Sciences Ondo Nigeria
[2] Department of Community Medicine, LAUTECH Ogbomosho Nigeria
[3] Department of Nursing Sciences, University of Lagos Nigeria
[4] Family Health International 360 Lagos Zonal Office Nigeria

Correspondence: Dr. Osifo JA. Address: Community Medicine Department, University of Medical Sciences, Ondo (UNIMED). GSM: +2348066859024. Email: joyosifo22@gmail.com

Abstract
Introduction: Road traffic crashes are common worldwide. However, most attention on RTA prevention has been focused on secondary and tertiary prevention. This study was undertaken to assess knowledge of road signs and attitudes to safety measures among secondary school students in Jos, Nigeria. Methodology: Descriptive cross-sectional study among 800 secondary school students selected using a multistage sampling method. Research instruments used were semi-structured interviewer-administered pre-tested questionnaires. Data were analyzed using the SPSS software version 23.0. Mean scores were generated for the major outcome variables of knowledge of road signs and knowledge and attitude to safety measures. Results: Mean age of respondents was 13.0+ 8.4 years, while the parents of 500(62.5%) of them had a vehicle. Correct knowledge of signs of corner bends was 417(52.1%), and traffic lights 579 (72.4%). Good mean knowledge of road signs and safety measures was 55% and 78%, respectively. Predictors of good knowledge of road signs include being a female, older age, and parents having a vehicle. Conclusion: Knowledge and attitude gaps still exist, and stakeholders in RTA prevention should prioritize the sensitization of the students amidst other primordial prevention strategies.

Keywords: Road Signs, Safety Measures, Road Traffic Accident, Secondary School Students/Adolescents

Background

The predominant mode of inter-and intra-city travel for most African countries is road transportation, which conveys about 90% of goods and persons (United Nations, 2009). In Africa, efforts to combat the adverse effect of road transports are minimal, resulting in worsening road traffic accident indices, when compared to other regions. (UN, 2009) Road signs are warnings against possible dangers and provide information to road users on how to keep the roads safe, including caution, regulations, restrictions, prohibitions, and locations (Ritaparna, 2004). According to the World Health Organization (WHO, 2015), over 1.2 million people die each year on

roads worldwide, making Road Traffic Accidents (RTA) the 9th leading cause of death across all age groups globally, and are predicted to become the seventh leading cause of death by the year 2030 (WHO, 2015).

Road traffic accidents occur throughout the word. Thousands of people lost their lives on the road every day. Road crashes are common in Nigeria. In Jos in Plateau state, a total of 68 persons died in 204 road crashes between January and December 2012, and some of these road accidents are related to refusal to adhere to traffic regulations and signs. Furthermore, data from the Federal Road Safety Commission (FRSC) revealed that an average of 13 people dies from road accident daily across Nigeria (FRSC, 2012).

Nigeria, like many other parts of the world, is experiencing a rapid increase in motorization without having adequate road traffic signs and safety mechanisms in place to control the growing number of crashes and injuries. In many communities, road signs are too few or not conspicuously placed. Primordial prevention geared at the prevention of risk factors to non-communicable diseases would benefit the occurrence of RTA. This study targets a vulnerable group who are not yet at risk of being a human factor to RTAs (secondary school students) since they are not eligible to drive a vehicle because they are underage. Studies on knowledge of road signs and road safety would contribute to promoting the implementation of road safety measures at regional or national levels, as well as assist decision and policy making in that direction. Thus, this study was undertaken to assess knowledge of road signs and attitudes to safety measures among secondary school students in Jos, Nigeria.

Methodology

Study area: The study was carried out in Jos (located in Plateau State), which is an urbanized city in Northern Nigeria. The city has a total of 75 registered secondary schools, both public and private. Most roads in the city of Jos have no road signs and some of the roads are dilapidated with pot holes, or are still under construction. There are numerous health facilities at primary, secondary and tertiary levels, where cases of road traffic accidents could be managed. The prevalence of road traffic accidents in the study area is not known due to poor record-keeping practices.

Study design: The study employed a descriptive cross-sectional design, to assess the level of knowledge about road signs and attitude to safety measures among secondary school students in Jos North LGA.

Study population: The target population consists of all secondary school students aged 10 – 19 years in their various schools. Students from private secondary schools were excluded from the study population because of the bureaucracy associated with data collection.

Sample size estimation: Sample size estimation used the Leslie Fishers formula for a population greater than 10,000 and a prevalence of 2.1%. A calculated minimum sample size of 733 was rounded off to 800 to account for non- response, attrition, and improperly filled or non-usable questionnaires.

Sampling method: The multi-stage sampling method was employed. In stage 1, two LGAs out of three were selected in Jos by simple random sampling employing simple balloting. In stage two, two schools per LGA were also selected by simple random sampling employing simple balloting. Questionnaires were equally allocated to LGAs and schools. In a school, all the levels were considered, however one arm (or class) per level were selected by simple random sampling employing simple balloting in stage three. To select study subjects, a list of the students was obtained from the class register (sampling frame) on the day of the visit. A systematic sampling of one in three students was obtained (after selecting the first candidate at random), and this continued until allocated questionnaires were exhausted to complete the 4th sampling stage.

Research instrument: Data were collected through the use of a semi-structured, self-administered pre-tested questionnaire that was divided into three parts, namely socio-demographic data, data on road signs knowledge and attitude, and data on road safety knowledge and preventive practices. The questionnaire was reviewed by the Plateau state epidemiologist in charge of non-communicable diseases.

Ethical consideration: Data were collected during school hours after seeking the consent of the school principals and the class teachers. The rationale for the study was explained to the students by addressing them in the classroom. A written informed consent was obtained from each student.

Data management: Data were collected, entered and analyzed using the SPSS version 23. The results were summarized in frequency tables and charts. Further analysis was carried out using the chi-square test and binary logistic regression to demonstrate association between major outcome variables and socio-demographic data of respondents. *P*-value was considered significant if equal or less than 0.05

Results

Table 1: Background information of respondents (n = 800).

Background information of respondents	Frequencies	Percentages
Sex		
Male	386	48.2
Female	414	51.8
Age (Mean 13.0 ± 8.4) years		
Under 10	89	11.2
11 – 20 years	412	51.4
21 years and above	299	37.4
Class		
JSS 1 – 3	291	36.5
SS 1 – 3	509	63.5
Father's occupation		
Civil servant	462	57.7
Private	288	36.0
Others	50	6.3
Mothers occupation		
Civil servant	397	49.6
Private	340	42.5
Others	63	7.9
Does your parent have a vehicle?		
Yes	500	62.5
No	300	37.5
How long have you been in this school?		
Less than 2 year	77	9.6
2 – 3 years	373	46.6
4 years and above	350	43.8

Table 1 shows background information of respondents. More than half 412 (51.4%) of them were between the ages of 11 – 20 years, with average age of 13.0 ± 8.4 years. About three- quarter 509 (63.5%) of the students were in the senior secondary school (SS1-3) More than half 426 (57.7%) said their fathers were civil servants, while close to three quarter 500 (62.5%) said one or both of their parents had a vehicle.

Table 2: Awareness of four most common road sign

Road sign	Sign/picture	Correct answer	Incorrect answer
Corner bend		417 (52.1%)	383 (47.9%)
Traffic light		579 (72.4%)	221 (27.6%)
Motorcycle is prohibited		587 (73.4%)	213 (26.6%)
School zone		163 (20.4%)	637 (79.6%)

Table 2 shows knowledge of road signs among respondents, with more than half 417 (52.1%) of the students knowing what the corner bend road sign meant. Majority 579 (72.4%) of the respondents could interpret the meaning of the traffic light sign on the road, while majority 637 (79.6%) of the student could not interpret correctly the school zone sign. Majority 587 (73.4%) of the secondary school student interviewed were able to interpret the motorcycle prohibited sign on the road.

Figure 1: Source of information about road traffic signs

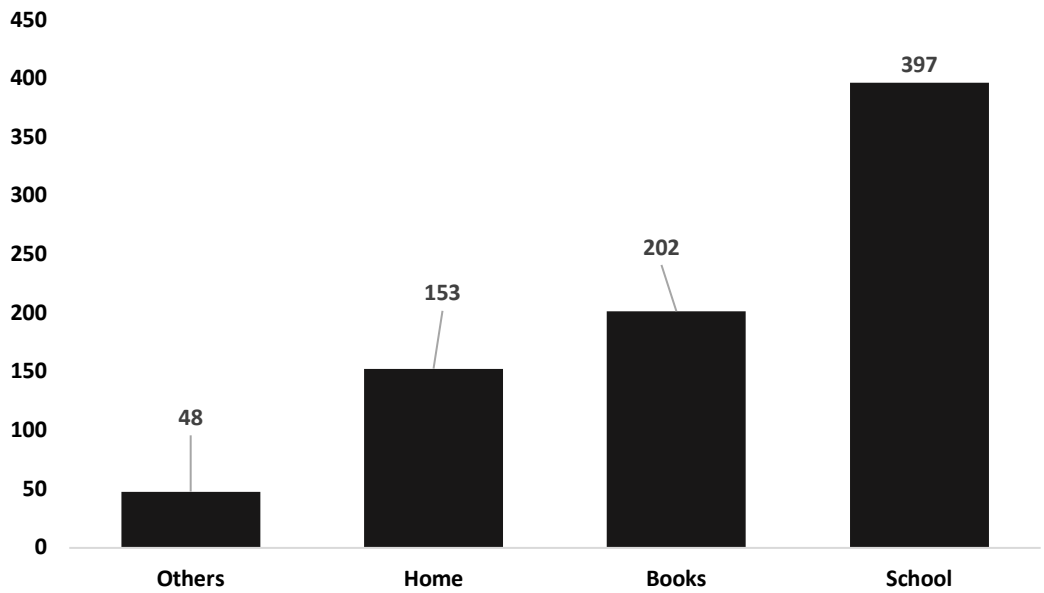

Figure 1 is a composite bar chart displaying respondent's sources of information about road traffic signs. Out of 800 students interviewed, 397 (49.6) of them said their major source of information about road sign was from the school, while few 48(6.0%) of them said it's from other sources like internet, radio, television, etc.

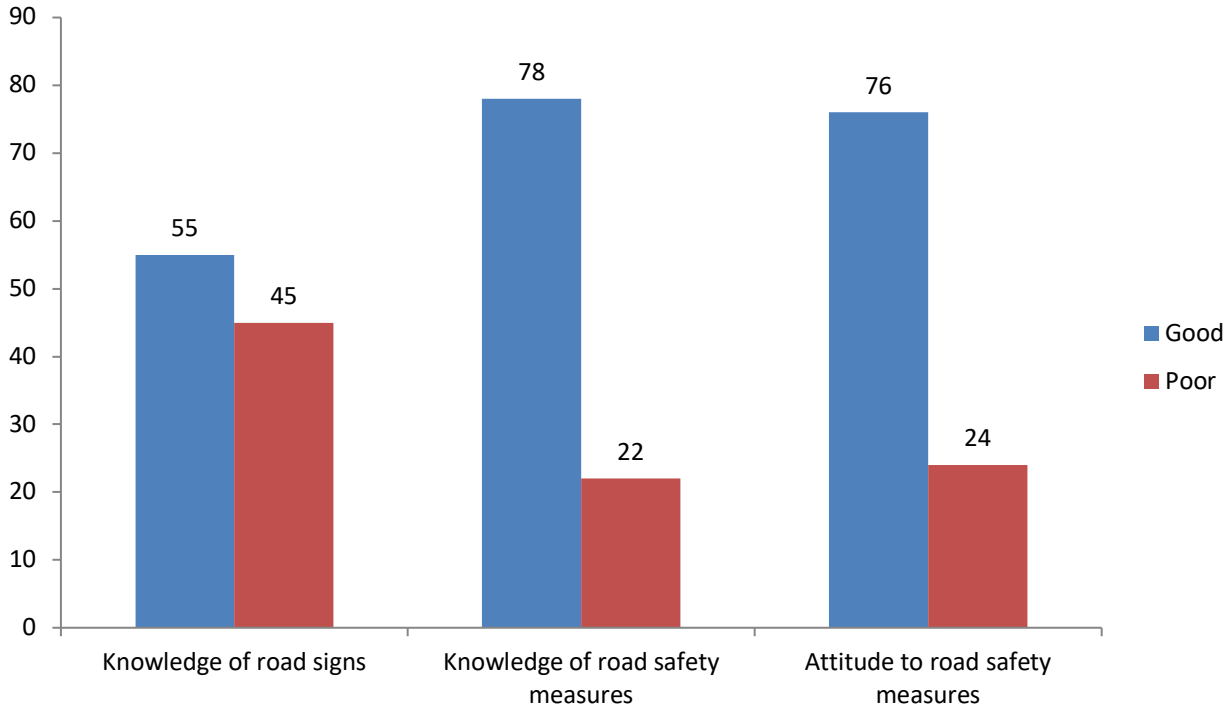

Figure 2 shows a component bar chart of knowledge and attitude to some road safety indices. Close to half (45%) of the respondents had poor knowledge score of the road sign, while 55% of them had good knowledge score of the road sign. The mean knowledge score of safety measures shows that majority 78% of them had positive knowledge scores while close to a quarter 22% had poor knowledge. The diagram also shows attitude to road safety measures with majority (76%) of them having good attitude, while (24%) of them had poor attitude. The same diagram on preventive practices shows that more than three quarters (76%) of the secondary school students interviewed had good knowledge on prevention on the roads, while 24% of them had poor knowledge on prevention on the road

Table 3: Knowledge and attitude to road signs and safety measures and some selected socio-demographic variables.

Variables	**Bivariate analysis**				**Binary logistic regression**			
					(a) Knowledge of road signs			
	Knowledge of road signs		**X^2**	**P value**	**Odds Ratio**	**95%CI**		**P value**
	Good	**Poor**				**Lower**	**Upper**	
Age			43.758	0.001	1.499	0.441	5.098	0.517
Under 10 years	34 (38.2)	55 (61.8)						
11 – 20 years	247 (60.0)	165(40.0)						
21 years and above	209(71.6)	83(28.4)						
Sex			19.971	0.001	0.797	0.253	2.151	0.698
Male	262(69.1)	117(30.9)						
Female*	228(55.1)	186(44.9)						
Parent have a vehicle			36.604	0.001	1.759	0.000	2.143	0.990
Yes	302(61.3)	191(38.7)						
No*	188(62.7)	112(47.3)						

			(b) Knowledge of road safety measures					
	Good	**Poor**			**OR**	**Lower**	**Upper**	**P value**
Age			20.017	0.001	0.649	0.459	0.918	0.015
Under 10 years	69(77.5)	20(22.5)						
11 – 20 years	352(85.4)	47(11.4)						
20 years and above	252(88.1)	34(11.9)						
Sex			6.952	0.031	0.623	0.414	0.939	0.024
Male	312(82.3)	67(17.7)						
Female*	361(88.5)	47(11.5)						
Parent have a vehicle			37.207	0.001	2.464	1.638	3.708	0.017
Yes	448(89.6)	52(10.4)						
No*	225(78.4)	62(21.6)						
			(c) Attitude to road safety measures					
	Good	**Poor**			**OR**	**Lower**	**Upper**	**P value**
Age			23.868	0.001	0.117	0.050	0.272	0.001
Under 10 years	55(61.8)	34(38.2)						
11 – 20 years	287(69.7)	115(30.3)						
20 years and above	238(83.2)	48(16.8)						
Sex			1.299	0.522	0.251	0.143	0.442	0.001
Male	274(72.3)	105(27.3)						
Female*	306(75.0)	102(25.0)						
Parent have a vehicle			32.732	0.001	1.368	0.844	2.217	0.204
Yes	395(79.0)	105(19.0)						
No*	185(64.5)	112(35.5)						

* = reference group

Table 3 shows that a statistically significant association was found between knowledge of road signs or safety measures and attitude to safety measures and age, gender and parents having a vehicle ($p<0.05$). Going by positive odds ratio relative to a reference category, predictors of good knowledge of road signs include being a female, older age and parents having a vehicle.

Discussion

This study aimed to assess the knowledge and attitude of secondary school students in Jos North LGA to road signs and road safety. The fact that most of the respondents' parents possess vehicles suggests that respondents are vulnerable and are at risk of constituting human factor to RTA. Though they are not driving, they are probably watching their parents.

Correct identification of road signs and sources of information

In the present study, more than half of the respondents could recognize the corner bend, traffic light and motorcycle prohibition signs and what they represented. However, only about a quarter could interpret the school zone sign. This finding is similar to that of Mahawar et al (2013) in Indore among school going teenagers; and Kulkarni et al (2013) in South Indian. It reported that three quarter of the students indicated they knew corner bend sign and half knew both traffic light interpretation and motorcycle prohibited sign correctly. The generally good awareness of road signs in these studies could be because the knowledge of road signs is routinely being taught in primary and secondary schools including Nigeria. Good knowledge of road signs is favourable to the control of RTA as the students would be able to recognize road signs and follow the interpretations when they are eligible to drive in the nearest future. This would help to prevent road traffic crashes and injuries, thereby fulfilling a major objective of the school health program. The higher figure of awareness of corner bend sign in the Indorean study could be due to good availability of road signs on their roads compared to Nigeria.

Major source of information on road safety was obtained from the school in this study. This is in keeping with similar studies conducted among school students in France by Blincoe et al. (2002), where it was clearly

indicated that most of the students got their information on road safety from their schools. The similarity could be as a result of inclusion of road safety rules and regulation in the student curriculum and sensitization of students and teachers by road worthy agencies. In addition, the information about road safety rules is usually given during school health program.

Knowledge of road signs and safety measures

Good knowledge of road signs and road safety measures were reported among about three quarters of our respondents. Similarly good knowledge was reported in a Nigerian study among half (Adogu et al., 2006), and another study in India among adolescent students that reported adequate knowledge among just about half of the respondents (Ranjan DP et al., 2018). The higher knowledge level in this study could be due to the possession of vehicle by a parent of at least two-third of the respondents, leading to better awareness. In addition, certain environmental and contextual factors may have come into play to bring about the disparities observed.

Pertaining to the use of seatbelts while in a car, more than three-quarter of our subjects responded that they always made use of seatbelt, and only few indicated non-use. A similar work by Raj et al. (2006) in India reported that more than three- quarter of student agreed with the use of seat belt. In this study, three- quarters of respondents were aware of the importance of seat belt, which agreed with the findings of Raj et al., (2006). These findings could be due to understanding of the regulation on seat belts by school students, regular enforcement of the use of seat belts by the FRSC, and the introduction of physical and health education/health science in the school curriculum.

Knowledge and attitude towards road safety measures

On the attitude of respondents towards road safety, majority of the respondents said they were comfortable with having road signs by the road side, close to half said they could interpret road signs very well while less than one quarter believed they did not have any responsibility on the road. Related study by Maha et al., (2007) and Kulkarni et al., (2012) reported similar findings. These findings could be adduced to the cosmopolitan nature of the study area and a better improvement on road safety education and communication in the countries where the survey was conducted.

Association between knowledge and attitude to road signs and safety and some socio-demographic variables

Mean knowledge and attitude scores was assessed against selected socio-demographic variables that could influence the findings of the survey viz age, sex and parents' possession of vehicle. Ranjan et al. (2018) also reported knowledge adequacy about road safety rules and regulations had statistically significant association with age and gender. This study revealed that female students of 9 years and above had positive attitude compared to their male counterparts. The increment of knowledge of road signs with age is not unexpected. As one grows older, there is every tendency to behave more maturely and responsibly in order to keep away from harm and danger. The better attitude to road safety among females when compared to male may be attributed to their delicate, gentle and careful nature, as well as always wanting to pay attention to details.

Parents having a vehicle are a predictor of good knowledge of road signs, and knowledge and attitude to road safety measures. Respondents whose parents had vehicles had better attitude and knowledge of road signs and safety, compared to those whose parents did not have vehicles. Possession of vehicles by parents may have contributed to the increased knowledge of the respondents from observing and taking note of their parents' road safety behaviors while driving their vehicles.

Study limitation

A limitation of the present study is that the findings may not be generalized on out of school adolescents. The study is also limited by its cross-sectional and self-reporting nature. However, the study will serve as a guide for planning and implementing interventions targeted at improving road safety practices among students generally.

In conclusion, there is good knowledge of road signs, and good knowledge and positive attitude towards road safety among a significant proportion of students surveyed. A significant knowledge gaps still exists among the students, and more efforts are needed to be done in that regard. It is necessary to institute road safety programs in schools, aside including it in the school curriculum, so that students could be more involved in road safety practices and make them more conscious of their environment, resulting in reduction of road traffic.

Acknowledgement: Authors wish to thank the principals and class teachers of all the schools used in data collection, as well as individual students who consent into participating in this study.
Funding: No external funding was received towards the conduct of this study.
Conflict of interest: None to declare between authors and institutions involved

References

Adogu, O.U., Ilika, A.L. (2006). Knowledge of and attitude towards road traffic codes among commercial motorcycle riders in Anambra State, Nigeria Postgradmed. 13:297-300.

Blincoe, LJ, Seay A, Zaloshnja, E. (2002). The Economic Impact of Motor Vehicle Crashes (DOT HS 809 446) Washington, DC: U.S. Department of Transportation, National Highway Traffic Safety Administration; 56-62.

Federal Road Safety Corps. (2012). Nigeria Road Safety Strategy (NRSS). 2012 – 2016.

Jha, N., Srinivasa, D.K., Roy, G., Tagdish, S., Minocha, R.K. (2004). Epidemiological study of road traffic accident cases: A case study from South India. India J. Community Med.29, 20.4.

Kulkarni, V., Kanchan, T., Palanivel, C., Papanna, M. K., Kumar, N., Unnikrishnan, B. (2012). Awareness and practice of road safety measures among undergraduate medical students in South Indian State. Medical Journal of Forensic Medicine. May 20(4):226-9.

Maha, A., Kavi, B., Majid, C., Joshua, S., Micheal, R. (2007). A risk-based method for modelling Traffic Fatalities. Risk analysis, vol 27, No 1. 104-113.

Mahawar P, Dixit S, Khatri AK, Rokade R, Bhurre, R, Kirar S, et al. (2013). An Educational invention to improve awareness on road safety: A study among school going teenager in Indore. Nat J Comm Med. 4(3):529:32.

Raj, T. S., Dandona, L., Dandona, R., Kumar, G. A. (2006). Pattern of road traffic injuries in vulnerable population in Hydrerabad, India inj, prev. 12. 183-8.

Ranjan D.P., Fahim M.A., Kirte R.C. (2018). A cross sectional study to assess the knowledge, attitude and practice towards road traffic safety among adolescent students of a selected Pre-University college in Raichur city. International Journal of Community Medicine and Public Health, 5(6):2446-2452.

Ritaparna, L (2004). A policy on Geometric Design of Highways and Streets. Washington D.C: American Officials.

United Nation (2009). The transport situation in Africa. Economic and social council commission of Africa. Sixth session of the committee on trade' regional cooperation and trade. E/ECA/CTRCI/5/3:1 Oct, 2009.

WHO (2015). Global status report on road safety 2015. Geneva: World Health Organization. Retrieved 17 July, 2017. Available at http://whql:bdoc.who.int/publications/2015/978924156384.eng.pdf.