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Contents

Road traffic accidents in Ethiopia:
magnitude, causes and possible interventions

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Abstract

Although road traffic accidents are a major global public health problem, most of it occurs in low- and middle-income countries including Ethiopia. Pedestrians and passengers of commercial vehicles are the most vulnerable in Ethiopia, whereas in high-income countries crashes involve primarily privately owned vehicles with the driver being the main car occupant injured or killed. In the United States of America, for instance, 60% of the fatalities account to car drivers, while in Ethiopia, 5% account to drivers. This implies that in one crash the number of people killed or injured in Ethiopia is about 30 times higher than in the US. This study aims at identifying the main causes of the problem; and at giving recommendations based on the findings. It focuses on Ethiopia's road traffic accidents magnitude, causes and possible interventions. The Haddon Matrix, which explains injuries in terms of factors (Host-Agent – Environment) and also in terms of a time sequence (Pre-crash, Crash, Post-crash), was used to classify the key determinants of road traffic accidents in Ethiopia and also used to make the analyses. Poor road network; absence of knowledge on road traffic safety; mixed traffic flow system; poor legislation and failure of enforcement; poor conditions of vehicles; poor emergency medical services; and absence of traffic accident compulsory insurance law have been identified as key determinants of the problem. There is currently no national policy on the prevention of road traffic accidents; however, there are draft strategies on road safety. Road traffic accidents are a huge public health and development problem in Ethiopia. Its current situation requires a high level political commitment, immediate decisions and actions in order to curb the growing problem. Otherwise, it will get worse from day-to-day as motorization and population increase rapidly. This study recommends the Ghanaian and Colombian "hands-on" experiences, which are feasible to be implemented in Ethiopia.

Keywords – road traffic accidents, interventions, road safety, global trends of road traffic accidents, Ethiopia

1. Introduction

Road traffic accidents (RTAs), here defined as "*An accident that occurred on a way or street open to public traffic; resulted in one or more persons being killed or injured, and at least one moving vehicle was involved. Thus, RTA is collisions between vehicles; between vehicles and pedestrians; between vehicles and animals; or between vehicles and fixed obstacles*" [1], are a major global public health challenge.

Every year about 1.2 million people are killed and more than 20 million are injured or disabled globally [2]. About 85% of annual road-traffic related deaths and 90% of annual disability-

adjusted life years (DALYs) lost globally because of RTAs occur in low- and middle income countries (LMICs) despite the fact that they only have about 32% of the global motor vehicles (figure 1). These countries have shown an increase in deaths and disabilities from RTAs since the 1980s, high income countries (HICs), on the other hand, recognized the magnitude of the problem in the 1970s, and have since been working towards promoting road safety and raising awareness among road users. Hence, these countries reduced fatalities from RTAs by more than 25% during 1968 -1998, at the same time they increased by 340% in Africa, 200% in Asia and the Middle East, and 30% in Latin America [3]. If the present trends continue, the annual deaths and disabilities from RTAs will drop another 30% in HICs, while it will rise considerably in LMICs by 2020 [4].

A fact in many LMICs is that there is little or no systematic data on RTAs. Besides, when such is attempted to be collected, underreporting is very common [5]. To my knowledge, there has been little research made on RTAs in Ethiopia, and, as a result, there is a scarcity of data on this issue.

The World Bank and United Nations Economic Commission for Africa (UNECA) scoping study "*Urban mobility in three cities*", confirms the statistics that have been quoted in various studies, i.e. Ethiopia has one of the highest fatality rates per vehicle in the world. It is in excess of 100 fatalities per 10 000 vehicles. This should be compared with Kenya and United Kingdom, where the figure is about 19 and 2 per 10 000 vehicles, respectively [6, 7].

The true RTA fatality rate in Ethiopia is, however, greater than what is actually showed by the official statistics [8]. Therefore, in Ethiopia, there is a high tendency for underreporting it like in many LICs. This crucial problem is, actually, common all over the world. In the urban areas, although traffic police and hospitals are available, accident victims are usually evacuated by bystanders who lack the necessary skills and/or equipments in pre-hospital care. In addition, many of the victims are underprivileged people and they neither afford out-of-pocket payments nor do they have health insurances to receive health care services. As a result, many casualties such as these are not reported.
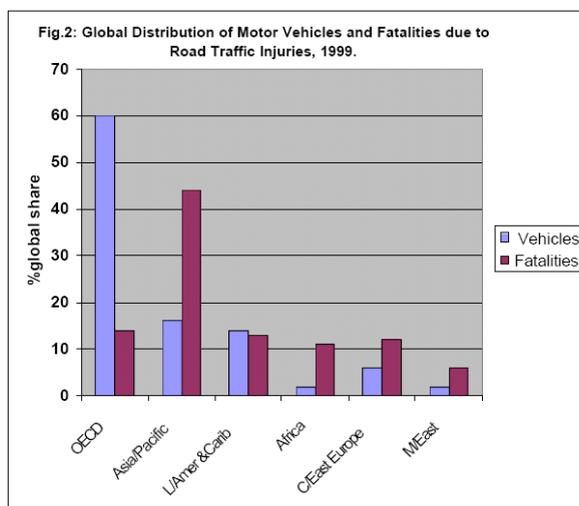

Fig. 1 – Global Distribution of Motor Vehicles and Fatalities due to Road Traffic Injuries, 1999
Source: Nantulya V. et al, (2002) [9]

In the rural areas, a communication system, which enables to instantly inform concerned bodies such as traffic polices and hospital emergency services in the incidence of RTAs, is inadequate. This implies that many crashes and number of victims can not be registered [8, 9].

About 64% of the total registered vehicles in Ethiopia are found in the capital Addis Ababa. However, the number of motor vehicles actually in use in the city is most likely higher than the registered figure.

This is partly because commercial vehicles continually drive to Addis Ababa to deliver goods from different parts of the country. These conditions increase the traffic volume in the city [6]. Out of all RTAs reported in Ethiopia, more than 65% occurred in Addis Ababa [10]. Walking is the predominant mode of mobility and accounts for 70% of all trips in Addis Ababa, while public transport and private motorized transport, respectively, account for 26% and 4% [11]. About 90% of the fatalities in the city are pedestrians, where school children represent a high proportion; of the remaining 10%, the victims are mainly public transport travellers. Twenty-seven percent of the city's public transport is provided by conventional buses owned by the government, while the remaining share is owned by private operators, of which, about 98% are mini-buses and the rest is taxis. The conventional buses are overloaded and poorly maintained. The mini buses are affordable to many people and convenient as they stop anywhere to pick-up or drop-off passengers; and have unfixed time schedules. However, the drivers' carelessness, i.e. aggressive acceleration and their general road manners, have made them to be unsafe [3, 6, 9]. For instance, in 2006 their accident rate increased by 32.6%, while private vehicles accident rate's increased by 1.4%, when compared to the previous year [12].

Contrary to HICs where crashes involve primarily privately owned vehicles with the driver being the main car occupant injured or killed, in LICs, including Ethiopia, crashes involve multi-passenger vehicles which include buses, trucks, and minibuses. As a result, the number of people killed or injured in LICs is about 30 times higher than in HICs [9]. In the United States of America, for instance, 60% of the fatalities account to car drivers, while in Ethiopia, a small proportion of fatalities account to this category, and more than 50% and 45% of fatalities account to pedestrians and passengers, respectively (figure 2) [3].

Most of these victims are in their working age and, thus, they are breadwinners for their families. Resulting in families being deprived or trapped by a cycle of poverty, in a country where there are no social security services. RTAs impose a heavy burden on the health sector as well. Although most accident victims are from the lower socio-economic strata and cannot afford to seek health services, hospitals are still stretched to the extent that they cannot cope with the growing problem, due to their limited capacity in terms of health facilities, human resources, and so forth [5, 6, 13]. For instance, 9 months surveillance in 6 major Addis Ababa hospitals shows that road traffic injuries accounted for more than 41% of the injury cases [14].

The economic impact of RTAs is substantial for Ethiopians. The annual cost is estimated to be around GB£40 million [8]. This is, however, just the tip of the iceberg, since all the causes of it are not reported. In addition, most cars are not insured. The same applies for other property such as houses.

This is mainly a result of two factors. Firstly, having insurance is not compulsory; and secondly, insurance companies request very high premiums for commercial vehicles, such as mini-buses, as they are causing most of the accidents. Thus, it is difficult to measure the accurate economic cost [15]. According to East and Central African Journal of Surgery Vol.11, No. 1, PP. 41-48, injury is a major health problem accounting for more than a quarter of all surgical admissions, deaths or disabilities in Ethiopia.
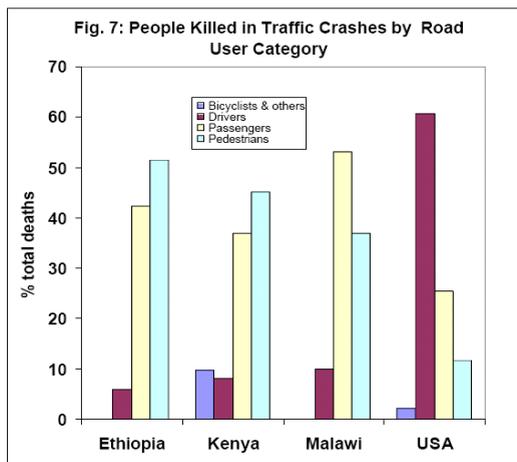
Fig. 7: People Killed in Traffic Crashes by Road User Category

Fig. 2 – The profile of vulnerable road users in LICs and HICs
Source: Nantulya V. et al, (2002) [9]

Tab. 1 – The Haddon Matrix

PHASES		FACTORS			
		HUMAN	VEHICLES	ENVIRONMENT	
				PHYSICAL	SOCIAL/ ECONOMIC
Pre-crash	Crash prevention	Information Attitudes Impairment Use of Alcohol Police enforcement	Roadworthiness Lighting Braking Speed-Management	Road design Road layout Speed limits Pedestrian-facilities	Cultural norms
Crash	Injury prevention during the crash	Use of seat belts Wearing fastened helmet	Seat belts Helmets Other safety devices	Crash-protective roadside objects	Vehicle design regulation
Post-crash	Life sustaining	First Aid Medical treatment	Ease of access Fire risk	Rescue facilities Traffic congestion	Standard of trauma care in hospitals

Sources: Peden M. et al (2004)[5]; Hazen A. et al (2006)[19];
Traffic Safety Centre (2005/06)[18]

The same journal highlighted that in the economically active age group, RTA is the leading cause of death only next to HIV/AIDS and yet it has got less attention in Ethiopia [16].

The theoretical tool used in this study is the Haddon Matrix (table 1), which has been applied for road safety promotion and accident prevention in many countries and has been proved to be successful. This matrix will enable this study to classify the key determinants of RTAs in Ethiopia and thus to give appropriate recommendations.

In 1968, Dr. William Haddon Jr., the first head of the United States of America Highway Traffic Safety Administration, developed the Haddon Matrix in order to assist researchers to systematically address injury prevention [17].

The Matrix is a conceptual model that applies basic principles of public health to the problem of traffic safety [18].

It explains injuries in terms of factors (i.e host-agent-environment), and also in terms of a time sequence (pre-crash, crash, and post-crash phases) [18, 19]. It enables to reveal where and when to best conduct traffic safety interventions and for fostering cooperation among different agencies [18].

It also promotes efficient allocation of resources by focusing on appropriate phase responses as it breaks a larger problem into smaller and more manageable components. It provides a practical, efficient decision making and planning tool which RTAs prevention specialists can use to better understand current and emerging problems [20]. The aim of applying the matrix is, therefore, to identify major modifiable factors that lead to negative (unhealthy) outcomes and thus to examine the various range of potential intervention points so that appropriate decisions, which consider political, cultural and other practical issues, can be taken [17].

The objective of this study is to identify the key determinants of the problem in Ethiopia and classify them based on the Haddon Matrix.

And to examine whether current policies and/or programmes in Ethiopia match with the existing epidemiology data. If not, to recommend preventive interventions those have shown to be effective in various countries in the world and are feasible to be implemented in Ethiopia given its context.

2. Materials and methods

The materials for this study derived from an array of sources include literature on road traffic safety, accidents and interventions found through databases of PubMed, World Bank, Transport Research Laboratory, Organisation for Economic Co-operation and Development (OECD); and World Health Organization (WHO), as well as, national studies investigating road traffic accidents (RTAs), which were collected in Ethiopia from various offices, including Federal Traffic Police Commission; Addis Ababa Traffic Control Departments; Ethiopian Road Transport Authority; National Road Safety Coordination Office; Ethiopian Ministry of Health; Ethiopian Insurance Corporation; and Ethiopian National Forum for Rural Transport and Development. Most of the statistics used in this study are from WHO statistical data.

Personal interviews were conducted in order to fill in the gaps that were found during the collection of data in Ethiopia.

The interviews were semi-structured and open ended, and were conducted face-to-face in various governmental and international organizations that are responsible to promote road safety and prevent road traffic accidents.

The international organizations were United Nations Economic Commission for Africa, which has the mandate to promote road safety in Africa, and WHO Country Office in Ethiopia, which is responsible to support national health strategies and address the most pressing public health concerns of the nation.

The questions include the magnitude of the problem, the methods used to collect data, and interventions that are currently in place to curb the growing problem.

In addition, the determinants of RTAs in Ethiopia were classified using the Haddon Matrix, which was also applied as an analytical tool.