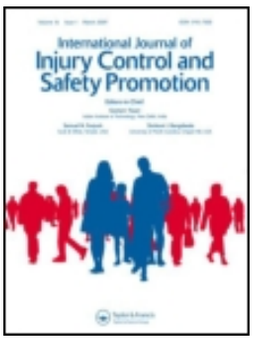

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Road traffic injuries in Kenya: Magnitude, causes and status of intervention

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Abstract

Road traffic crashes exert a huge burden on Kenya's economy and health care services. Current interventions are sporadic, uncoordinated and ineffective. This report offers a descriptive analysis of secondary data obtained from a variety of published literature and unpublished reports. Over three thousand people are killed annually on Kenyan roads. A four-fold increase in road fatalities has been experienced over the last 30 years. More than 75% of road traffic casualties are economically productive young adults. Pedestrians and passengers are the most vulnerable; they account for 80% of the deaths. Buses and matatus* are the vehicles most frequently involved in fatal crashes. Characteristics of crashes vary considerably between urban and rural settings: pedestrians are more likely to be killed in urban areas, whereas passengers are the majority killed on intercity highways that transverse rural settings. Road safety interventions have not made any measurable impact in reducing the numbers, rates and consequences of road crashes. Despite the marked increase in road crashes in Kenya, little effort has been made to develop and implement effective interventions. Impediments to road traffic injury prevention and control include ineffective coordination, inadequate resources and qualified personnel, and limited capacity to implement and monitor interventions. There is need to improve the collection and availability of accurate data to help in recognising traffic injury as a priority public health problem, raising awareness of policymakers on existing effective countermeasures and mobilizing resources for implementation. Establishment of an effective lead agency and development of stakeholder coalitions to address the problem are desirable.

Keywords: Kenya; injury; traffic; road crashes; highways.

Introduction

Kenya has one of the highest road fatality rates in relation to vehicle ownership in the world[1], with an average of 7 deaths from the 35 road crashes that occur each day[2]. Nearly 3000 people are killed on Kenyan roads annually. This translates to approximately 68 deaths per 10,000 registered vehicles, which is 30–40 times greater than in highly motorized countries[3]. Road traffic crashes are the third leading cause of death after malaria and HIV/AIDS, and present a major public health problem in terms of morbidity, disability and associated health care costs[4]. Despite this huge burden, road safety measures in place are ineffective, characterised by procrastination and sporadic, symbolic crackdown on motor vehicles following a tragic road crash. This paper presents a situational analysis of the problem and highlights some impediments to intervention.

Materials and methods

Data were obtained from a variety of sources including police records, medical records, research reports and articles, statistics abstracts and national newspapers.

Traffic police records

The Kenya police routinely collect and store data on motor vehicle crashes involving personal injury or fatality, mainly

* *Matatus* are small-scale public transport vehicles in Kenya. These vehicles are important in public transport but they flagrantly violate traffic rules.

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for prosecution and insurance compensation purposes. Police reports are the single most comprehensive source of data on traffic crashes in Kenya, as they are collected by every police station using a standard form and submitted to the police headquarters for collation and analysis. We reviewed the statistics for the years 1965 to 1998, disaggregated by administrative provinces. The records contained information on crash severity (whether fatal, serious or slight), categories of road users affected, vehicles involved and causes of crashes, mainly attributed to human error, vehicle defects and traffic environment as judged by the investigating officers. Since the police only record crashes that are reported and deaths occurring on the spot, this data source is therefore likely to underestimate the true magnitude of road traffic fatalities.

Medical records

We reviewed the Ministry of Health's annual outpatient and inpatient morbidity reports for the years 1988, 1994 and 1998[4,5,6]. The reports, compiled by the health information system unit, are based on data submitted quarterly by only 45% of government health facilities; private and nongovernmental institutions do not normally send reports to the Ministry. The routine reports are grossly incomplete and imprecise with respect to demographic characteristics and information on the cause of injury.

Research reports and articles

We searched Medline, PubMed and EMBASE electronic databases for published papers reporting any aspects of road traffic crashes in Kenya between 1966 and 2001. We also accessed unpublished research reports and dissertations from various university libraries in Kenya.

Statistical abstracts and other reports

Statistical abstracts for the years 1994–1998 published by the Central Bureau of Statistics and reports of the Ministry of Transport and the National Road Safety Council were also accessed for complementary information.

Newspapers

The national newspapers (Daily Nation, East African Standard, Kenya Times) normally publish reports of fatal road crashes, especially those involving buses, minibuses and matatus. Six months of back issues (January–June 2001) of the three papers were obtained and scanned for reports on fatal crashes.

The quantity and quality of data found within these sources varied considerably, depending on the purpose for collecting the data and the level of detail required. In general they were incomplete and inaccurate with respect to basic variables that describe demographic and injury characteristics.

Results

Epidemiological characteristics

From the above data sources, we present below a summary of the epidemiological characteristics of road traffic crashes in Kenya under the following subheadings: (1) Temporal trends; (2) Spatial distribution; (3) Vehicles involved; (4) Demographic profile of the casualties; and (5) Injury severity.

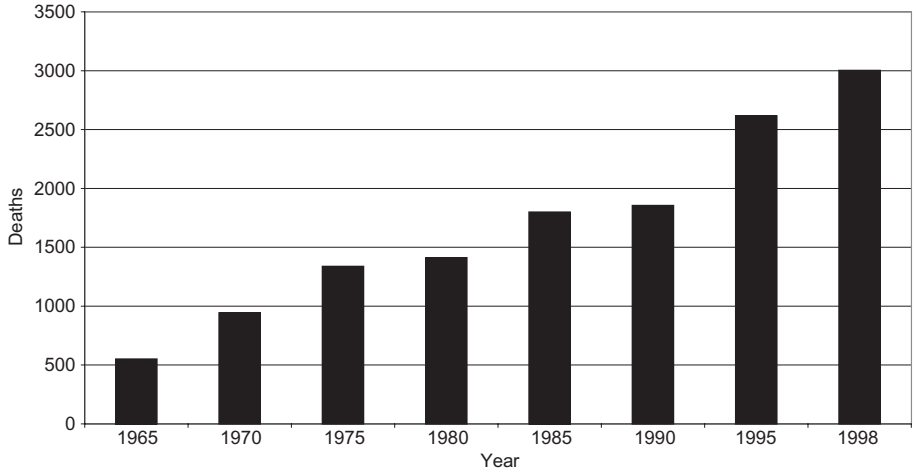
Temporal trends

Kenya has experienced a rapid increase in number of road traffic injuries and their consequences in terms of mortality, morbidity and disability[1,7,8,9]. According to traffic police reports, road traffic crashes rose from 3562 in 1965 to 14,342 in 1998, and the number of persons killed from 552 to 2972 – increases of 300% and 430%, respectively (Fig. 1). As shown in Table 1, an increasing trend in absolute numbers of the reported crashes and the mean number of casualties per crash, from 1.3 in 1965 to 2.0 in 1998, was also observed, partly reflecting the frequent involvement of matatus and buses with a high passenger load.

The road traffic fatality rate per 100,000 population during the period 1985 to 1998 ranged from 7.8 to 10.6 (Fig. 2). These rates do not reflect significant variations over the period despite the phenomenal increase in road traffic deaths. This trend can partly be explained by the effect of population growth experienced over the same period: Kenya's population increased by 45% (from 20.3 million to 29.5 million) between 1985 and 1998. It may also be attributed to the severity of crashes involving public transport vehicles although the reported fatality data were not disaggregated by vehicle type.

Spatial distribution

There are considerable variations in numbers and consequences of road traffic crashes by geographical region and road location (rural or urban). For instance, of the 96,927 road traffic crashes reported during the period 1986–1994, over 30% occurred in Nairobi. Central, Rift Valley and Coast provinces each recorded between 10 and 20% of the total, while Nyanza, Eastern and Western provinces had 5–10% each, with North-Eastern province reporting the lowest proportion[10]. Of the total road deaths reported in 1990, 55% occurred in Nairobi, Central and Rift Valley Provinces, while Eastern (9.2%) and North-Eastern (1.3%) provinces reported the lowest numbers. The category of road users killed also varied by region: 68% of fatalities in Nairobi were pedestrians, whereas in North-Eastern, Rift Valley and Eastern provinces, the majority killed were passengers (Table 2). The data in Table 2 further show that the case fatality rates (calculated as a percentage of deaths to all casualties reported in the province) similarly varied by province, with North-



Source: Based on data from NRSCK, 1992; Central Bureau of Statistics, 1995, 1999.

Figure 1. Road traffic fatality trends in Kenya, 1965–1998.

Table 1. Trends in road traffic crashes and casualties in Kenya, 1965–1998.

Year	No. of crashes (b)	Total casualties* (a)	Mean casualties per crash (a/b)
1965	3,562	4,698	1.3
1970	5,163	7,756	1.5
1975	6,534	9,621	1.5
1980	6,162	10,313	1.7
1985	8,474	15,383	1.8
1990	10,306	18,930	1.8
1992	12,735	26,127	2.0
1993	12,355	24,440	2.0
1994	11,785	22,960	1.9
1998	14,342	28,492	2.0

* Includes fatal and non-fatal cases.
Source: Data from National Road Safety Council, 1992, and Central Bureau of Statistics, *Statistical Abstract*, 1999.

Eastern province leading with 12.6% and Nairobi having the lowest rate (7.3%).

Furthermore, statistics published by the National Road Safety Council show that 60% of all injury-producing crashes occur on roads in rural areas, mostly intercity highways, whilst 40% take place in urban areas[11]. On average, the number of casualties per motor vehicle crash or collision occurring on rural roads (1.8) is greater than on urban roads (1.2). Case fatality rates are also 5.4% higher for crashes on rural roads than those in urban areas[12]. Of those injured on rural roads, Central (32%) and Rift Valley (28%) provinces had the highest proportions of all road traffic injuries occurring in rural settings. This can be attributed to the greater number of buses and matatus that are involved in the crashes: 62% of all reported crashes involve public transport vehicles[8]. It may also reflect the effect of underreporting of non-fatal crashes (denominator data) occurring on rural areas.

It is evident that most road traffic crashes, fatalities and injuries occur in Nairobi, Central, Rift Valley, Coast and Eastern provinces. These provinces have a high concentration of human population and socioeconomic activities that demand considerable mobility. They also have higher road network density and connectivity. About 145 dangerous road locations have been identified on Kenya's main rural road network (Table 3), found primarily in the Central, Rift Valley, Western and Nyanza provinces[13].

Vehicles involved

Cars, pick-ups and vans are most frequently involved in crashes, comprising 41% of the reported crashes, with buses accounting for 10%, lorries 12%, matatus 11%, taxis 2%, tractors 2%, trailers and tankers 1%. Since buses constitute only 3.7% of the total registered vehicles in the country, their involvement in crashes is nearly three times greater than would have been expected. However, it would be impractical to make such comparisons for matatus, since the vehicle registration system is based on the make of vehicle, not whether they are used for ferrying passengers, and different types of vehicles, such as station-wagons, cars, pick-ups and vans, are commonly used as matatus. These data are also imprecise because they do not take into account the vehicle kilometres travelled. Buses and matatus, for example, are in use throughout the day and cover substantial distances, while cars are generally used for shorter, less frequent journeys. Data on distance travelled and passenger load is needed to provide a more accurate assessment the risk of a crash by different types of vehicles.

Demographic profile

The demographic characteristics that were examined include age, sex, and category of road users involved.

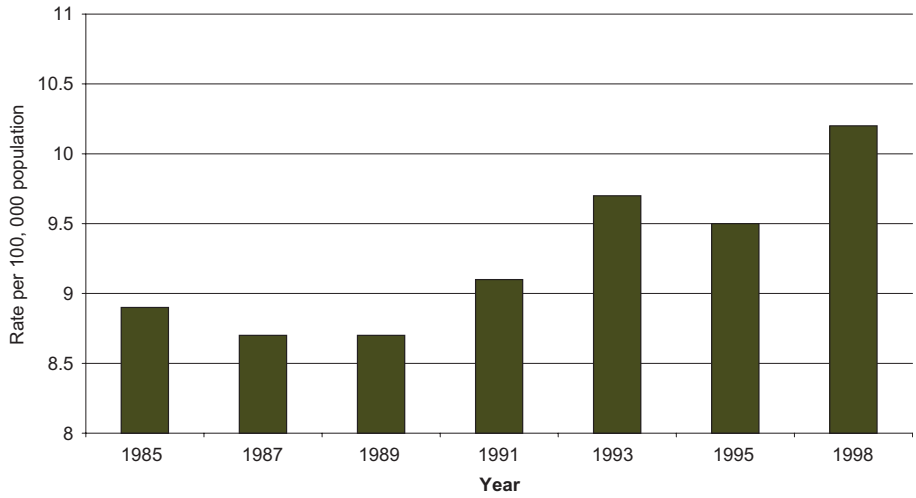


Figure 2. Road traffic fatality rate per 100,000 population, Kenya, 1985–1998.

Table 2. Road fatalities in Kenya by class of road-user and region (province), 1990.

	Class of road-user, in percents (N-1856)					
Province	Pedestrian	Passenger	Driver	Cyclist	% of total	*Case fatality rate %
Nairobi	67.9	16.9	8.8	3.2	16.6	7.3
Central	42.9	37.9	12.6	6.6	19.6	10.0
R/Valley	22.9	46.6	18.1	15.3	19.1	12.5
Coast	42.7	34.5	12.3	10.5	11.9	7.8
Eastern	29.5	45.5	20.5	4.5	10.8	10.2
Nyanza	42.3	36.7	8.4	12.6	11.6	11.5
Western	43.9	37.4	8.8	9.9	9.2	11.9
N/Eastern	20.8	70.8	–	8.3	1.3	12.6
All provinces	41.5	36.7	13.5	8.3	100	10.8

* Computed as percent of number of deaths/total number of casualties in each province (actual figures not shown).
Source: Odero, 1997. Based on data from National Road Safety Council, 1992.

Age

In the police-derived data, the ages of persons killed or injured are classified into two broad groups: children under 16 years and adults aged 16 years and above. The statistics for 1983–1990 show that children accounted for 10% of all casualties[11]. Between 14% and 19% of the juvenile victims were killed, while the case fatality rate for adults was lower (10%–14%). Other reports indicate overinvolvement of a young population in nonfatal crashes. Seventy-six percent of admissions at the Nakuru Provincial Hospital in 1992 were aged between 19 and 49 years (Limbalala and Chirwa, 1992, 'A survey of road traffic injuries admitted in 1990 at the Rift Valley Provincial General Hospital, Nakuru,' unpublished report). At two referral hospitals in Nairobi, 76% of patients admitted with traffic injuries were aged 15–44 years. In Eldoret this age group represented 78.5% of road traffic casualties, with a mean age of 30.3 years[14,15]. At the trauma rehabilitation centre of the National Spinal Injury Unit, the mean age of traffic-involved inpatients was 31 years[16]. These figures clearly demonstrate the adverse impact of road traffic crashes on the economically active and productive population.

Gender

Routine road traffic crash records generally lack information on the gender of victims. Therefore, the sex-specific distribution of affected casualties cannot be established from police statistics. However, hospital surveys in Nairobi, Nakuru, Eldoret and Kakamega have shown overinvolvement of

Table 3. Distribution of dangerous locations on Kenya's main rural road network.

Road section	Dangerous road locations		Crashes in 1981–82 (N > 5)	
	Number	Percent	Number	Percent
Nairobi-Limuru-Naivasha-Nakuru-Eldoret-Malaba	31	21.4	255	20.2
Rongo-Kisii-Kisumu-Kakamega-Webuye-Kitale	25	17.2	190	15.1
Nairobi-Mtito Andei-Mombasa	21	14.5	173	13.7
Thika-Makutano-Karatina-Kiganjo-Nanyuki	19	13.1	178	14.1
Makutano-Murang'a-Sagana	8	5.5	74	5.9
Mau Summit-Ahero-Kisumu-Busia	6	4.1	84	6.7
Nakuru-Mau Summit	6	4.1	43	3.4
Nairobi-Limuru-Naivasha (old road)	5	3.4	42	3.3
Kisii-Sotik	5	3.4	34	2.7
Mombasa-Lungalunga	3	2.1	43	3.4
Embu-Runyenjes-Meru/Isiolo Junction	3	2.1	26	2.1
Mombasa-Malindi	3	2.1	21	1.7
Meru-Maua	3	2.1	30	2.4
Sotik-Kericho	2	1.4	22	1.7
Nakuru-Kampi ya Moto	1	0.7	6	0.5
Sagana-Kutus	1	0.7	11	0.9
Marua R.-Nyeri	1	0.7	12	1
Karatina-Kerugoya	1	0.7	9	0.7
Nyeri-Kiganjo	1	0.7	8	0.6
Total	*145*	*100.0*	*1261*	*100.1*

Source: Khayesi, 1999. Based on Data from Republic of Kenya, 1983.

males, who represent 92%, 77.8% and 59.6% of casualties respectively[14,16]; Limbalala and Chirwa, unpublished report; Khayesi and Ayisi, 2002, "Socio-economic determinants of coping with injury and consequences of serious road traffic 'accidents': A case study of victims hospitalised at three hospitals in Kakamega district," unpublished report]. Those with long-term disabilities at the Nairobi's Spinal Injury Unit are also predominantly men, with a male: female ratio of 11.5 : 1[16].

Road users

Several studies indicate that pedestrians are the most vulnerable and pay a heavy toll for exposure to road traffic[8,10,14,17,18]. On average, they represented 42% of all crash victims killed between 1971 and 1990, whereas passengers accounted for 38%, drivers 12% and pedal cyclists 8%. Approximately 80% of the total annual road fatalities are pedestrians and passengers. Figure 3 is illustrative of a fairly stable distribution of the proportions killed over the years. For nonfatal traffic injuries, a survey of patients seeking treatment in hospitals in Eldoret showed that the majority were passengers (56.1%) and pedestrians (17.7%), whereas pedal cyclists and drivers comprised 13.4% and 11.4%, respectively[15]. A recent study at the Kenyatta National Hospital in Nairobi also reported overrepresentation of pedestrians (64.5%) and passengers (22.8%)[14]. These findings not only reaffirm the vulnerability of pedestrians and passengers to road traffic crashes, but also demonstrate differences between crashes in urban and rural settings. This implies that road safety interventions should focus on both vulnerable groups and the context of crashes.

Injury severity

Injury severity is often used as a measure of health consequences of road traffic crashes. Injuries are classified as fatal, serious or slight on the basis of information available to the police within a short time after the crash. Classifications may not reflect results of a medical examination and are largely influenced by whether a casualty is hospitalised or not. Injury is reported as fatal if death occurs on the spot or any time after hospitalisation. There is no defined time interval, though the police mostly report only deaths that occur on the spot, which represent an undercount of the actual numbers of road fatalities.

On average, 10.3% of crash victims die, 32.5% are seriously injured, and 57.2% slightly injured each year. Most severe injuries result from vehicle–pedestrian collisions, which also account for a higher case fatality rate (24%) than other types of collisions (18% in single vehicle, 17% in vehicle–bicycle, 12% in vehicle–vehicle

and 8% in vehicle–motorcycle)[15]. The data further highlight the vulnerability of pedestrians and cyclists as road users at greater risk of sustaining more severe types of injuries.

Economic and health burden

Economic costs

The cost of road crashes in Kenya has increased considerably over the years. In 1984, the estimated annual economic cost of road traffic injuries, using the human capital approach that comprises health care costs, administrative expenses, vehicle and property damage, was 1.5 billion Kenyan shillings[19] (approximately U.S.$19 million), an equivalent of 1.6% of the country's GNP for that year. This rose to K.shs. 2.9 billion ($37 million) or 3.6% of the GNP in 1988[20,21,22] and to 3.8 billion or 5% of the GNP by 1991[23]. In 1996, the costs were estimated to be between 5 and 10 billion Kenyan shillings[17]. This translates into a loss of 26–52% of the total earnings from road transport.

In 1995, the insurance industry was reported by the local press[24] to have spent the huge sum of K.shs. 20 billion (an equivalent of 5.5% of the year's GNP or U.S.$343 million) on road accident–related payments, including costs of vehicle damage, medical care, and compensation for injuries and fatalities. Such payments have led to large financial losses by this industry, causing many insurance firms to go out of business, and at the same time, necessitating steep increases in motor vehicle insurance premiums. Currently, of the approximately fifty insurance companies operating in Kenya, only two offer any form of insurance coverage for public service vehicles.

Burden on hospital services

Casualties affected by road traffic injuries account for between 45% and 60% of all admissions in surgical wards in Kenya, and up to 75% of inpatients at the National Spinal Injury Hospital[16], thereby placing high demands on hospital resources. A recent survey of 310 hospitalised road traffic injury victims showed that two-thirds of road traffic accident casualties stayed in hospital for more than three weeks [Macharia WM., 2000, unpublished report]. Just over half (51.9%) stayed for more than a month. Other reports document the burden of traffic injuries on hospital workload, with respect to utilization of x-rays services and operating theatre: 49% of all patients who had major surgery in Eldoret had been involved in a motor vehicle crash[15].

Causes

Causes as reported by police

The main categories of causes of motor vehicle–related traffic injuries, based on the Accident Cause Code classification used by the Kenya police, are human factors (85.5%), vehicle defects (5.1%), road environment (2.9%) and other factors (6.4%) (Table 4). The relative contribution of these factors has remained unchanged over the years. Driver errors such as losing control, speeding, misjudgement and improper overtaking accounted for the greatest proportion (44.4%) of all causes attributed to human error. Among the human factors, alcohol has been established to be associated with increased incidence of motor vehicle crashes. A survey involving patients hospitalised for injury treatment in Eldoret showed that 40% of drivers and 20.2% of pedestrians were

Table 4. Causes and percentages of traffic crashes in Kenya, 1990 and 1985–1990.

Cause (specific factors)	Particulars	1990	1985–90
I. Human – (speed, misjudgement, improper overtaking, alcohol, traffic violation)	Drivers and motor cyclists	44.4	44.3
	Pedestrians	27.1	27.4
	Passengers	6.8	6.7
	Pedal cyclists	7.2	5.9
Subtotal		**85.5**	**84.3**
II. Vehicle – (overload, defective breaks, tyres, steering system, headlights; tyre burst)	Tyres or wheels	2.5	2.2
	Other defects	2.6	3.9
Subtotal		**5.1**	**6.1**
III. Traffic Environment – (potholed, sharp/steep bends, slippery road)	Road defects	1.3	1.4
	Animals	0.7	0.9
	Obstruction	0.5	0.8
	Weather	0.4	1.4
Subtotal		**2.9**	**4.5**
IV. Other causes		6.4	6.2

Source: Odero. 1997. Based on data from NRSCK, 1992.

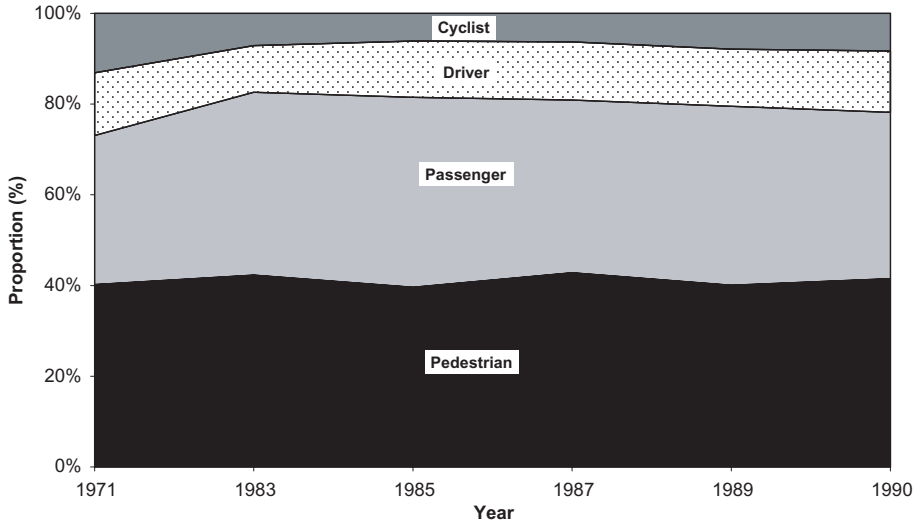


Figure 3. Trends in road traffic fatality by road-user category, Kenya 1971–1990.

Table 5. Membership of NRSCK.

Ministry of Transport and Communications
Office of the President (Police Department)
Ministry of Public Works and Housing
Ministry of Health
Ministry of Education
Ministry of Finance
Ministry of Information and Broadcasting
Ministry of Local Government
Attorney-General's Office
Nairobi City Council
University of Nairobi
Automobile Association of Kenya

intoxicated at the time of the crash[25]. Surprisingly, alcohol is almost never reported as a contributing factor in the police accident reports, partly because of lack of technologies and facilities to measure it, and the difficulties in getting doctors to examine crash-involved drivers and take their blood samples for BAC analysis at a government forensic laboratory.

Underlying causes

Factors contributing to the rising magnitude and burden of road traffic injuries are diverse and reinforcing[1,7,14,17,26]. These interrelated factors can be summarised under the following: rapid growth in motorisation and human population; increased traffic volume and movement; deficiencies and problems in road user behaviour; and poor public transport system with special reference to buses and matatus; the declining economic conditions in Kenya; deficiencies in road network development and maintenance; and deficiencies in road safety planning, management and interventions.

Status of road safety interventions

Development of road safety measures

Up to the late 1970s, road safety work was given a low profile in Kenya, and there was no programmed, coordinated and countrywide road traffic injury prevention system[27]. A national road safety improvement project was initiated in 1979 when the governments of Kenya and Finland agreed to start a joint road safety project within their development cooperation programme[28]. Activities of the programme initially included development of organisational structure, law enforcement, accident investigation, driver training, vehicle inspection, first aid training, information, education and road safety research. Later, between 1989 and 1991, the programme focused on five priority sectors: engineering improvements at hazardous road locations, developing new road safety demonstration projects, traffic law enforcement and public education[1,23,27,28].

The National Road Safety Council of Kenya

The National Road Safety Council of Kenya (NRSCK) was established in 1982 to set national policy on road safety, develop relevant implementation strategies, coordinate the work of all organizations involved in the promotion of road safety, acquire and monitor the use of sufficient resources and personnel for road safety work, and formulate a long-term programme for effective road safety work in the country. As shown in Table 5, its membership is multisectoral and comprises representatives of 12 government ministries, organisations and institutions involved in road safety work. The goal set by the NRSCK at inception was to reduce traffic fatalities by 30% from 1515 in 1983 to less than 1000 deaths in 1993[19]. This was not achieved; to the contrary there was a dramatic increase, as evidenced by the data presented above. Over the past years, the emphasis has been on primary

preventive measures focused on the following: public information through radio broadcasts and television programmes; road safety education in primary schools; training of children on safe road use at the specially constructed children's traffic parks in Nairobi and Kisumu; and identification of hazardous road locations. However, as in other countries in Africa, these interventions have not achieved the desired impact[1].

Effectiveness of road safety measures

An assessment of the effectiveness of road safety measures in Kenya provides valuable information that can be used to improve the programme[10]. The main strengths are the existence of an organisational framework (NRSCK), the presence of basic road safety legislation and policy, and the formulation of specific objectives, targets and implementation plans. However, in its present form, the NRSCK has several limitations that render it inefficient and ineffective. These include lack of coordination mechanisms, limited authority and responsibility, lack of resources, qualified personnel and logistical support, and limited capacity for research, monitoring and evaluation of interventions. Nevertheless, a number of opportunities exist, such as growing public and political awareness, emerging local and regional initiatives, and international support. If utilized, these can stimulate improvements in road safety interventions.

Discussion

This review adds to other literature highlighting the lack of surveillance systems with accurate and reliable data on which road safety policy and interventions might be based[29,30]. Most of the routine health service and traffic police data are incomplete and inaccurate, and published traffic injury research papers are scanty. Nevertheless, the available data provide some information that characterises the magnitude and consequences of road traffic crashes in the country. The enormous increase in crashes and the resulting injuries and deaths experienced over the last two decades is illustrative of the worsening road safety situation in the country.

Most crashes occur on intercity highways involve a disproportionate number of public transport vehicles (buses, matatus), and result in high fatality rates. On intercity highways, the high vehicle speeds, long distances travelled resulting in driver fatigue, lower police presence, inadequate emergency medical services in rural areas, and greater distances to hospitals, contribute significantly to the high frequency of crashes and poor survival rate of casualties. At the same time, there are numerous hazardous locations ('hot spots') along the nation's major highways. Specific road engineering modifications, police patrols and other interventions can be targeted at these places. The frequent involvement of buses and matatus in road crashes also indicates their general lack of basic safety features for passengers. For instance, these vehicles are overloaded, poorly built, have easily detachable seats, and are often driven recklessly at excessive speed[31].

As illustrated in this paper, there are distinct variations in the profile of vulnerable road users between rural and urban areas. Whereas passengers in buses and matatus constitute the majority in rural areas, pedestrians are most frequently involved in urban areas, constituting over 60% of traffic deaths. Similar variations have been reported in other regions of the world[32,33].

Young adults (aged 15–44 years) bear the brunt of road traffic crashes. This economically active and productive age group accounts for over 75% of the total road fatality and morbidity in the country, resulting in a huge economic loss at individual, family and societal levels. It is estimated that at the global level that this age group accounts for over 70% of the total years lost due to traffic crashes[30].

Causes of road traffic injuries are multifactorial and interrelated. Haddon's matrix showing the interaction of the various factors (human, vehicle, physical and social environments) at different phases (precrash, crash and postcrash) is illustrative[34]. This implies that data on causality need to go beyond just listing causes such as vehicle, road environment or human error, to determine underlying, multifactorial causes through purposely designed epidemiological and qualitative studies. It is not enough to state that speeding caused a road crash or that alcohol led to a road crash. Explanatory questions need to be addressed, such as: Why is there speeding when traffic and speed checks exist? Why do people drink and drive? Is the human error related to deficiencies in the legal, policy and institutional framework? How effective is the road safety programme?

As in other countries in Africa, the National Road Safety Council of Kenya has not been effective[1]. One of NRSCK's limitations is that it is simply an advisory body with no executive powers. It also lacks qualified personnel and sufficient resources to implement its plans. These deficits need to be addressed through the establishment of a central government agency with more authority, resources and technical personnel to provide leadership in road safety. Greater involvement by all key stakeholders and the public is also necessary to increase acceptance of and participation in context-specific road safety interventions.

Given the huge burden of road traffic crashes, their public health importance and the general public outcry, there is need for more sustained intervention efforts that go beyond public pronouncements and ad-hoc activities – such as setting roadblocks or short-term crackdowns on matatus (usually after an important personality is killed in a crash). Such efforts should address broader road safety policy issues and the various underlying causes. For this to happen, it is important to enlist political will and commitment for road traffic injury prevention. Accurate and reliable traffic injury data can help inform decision-makers, stakeholders and the public about the magnitude of the problem and intervention options that have proven effectiveness. An efficient national injury surveillance system is therefore essential.

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