



# Prevalence, Sociodemographic and Traffic Factors Associated with Fatal Pedestrian Road Accidents in Nairobi, Kenya: An Autopsy Study

Kiama Wangai

Department of Pathology, Egerton University, Njoro, Kenya  
Email: pkiamo1@hotmail.com

**How to cite this paper:** Wangai, K. (2025) Prevalence, Sociodemographic and Traffic Factors Associated with Fatal Pedestrian Road Accidents in Nairobi, Kenya: An Autopsy Study. *Open Access Library Journal*, 12: e14377.

<https://doi.org/10.4236/oalib.1114377>

**Received:** September 30, 2025

**Accepted:** November 7, 2025

**Published:** November 10, 2025

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## Abstract

**Background:** Globally pedestrians account for nearly a quarter of all road crash deaths, with the number of pedestrian victims rising at nearly twice the rate of all other road crash fatalities. The proportion of pedestrians killed compared with other road users is highest in the African Region, at 40%. Increasing incidence of road traffic accidents in Low and Middle Income Countries like Kenya calls for region and country specific interventions. There is, however, inadequate data to inform such context-appropriate interventions. **Objective:** The objective of this study was to determine the prevalence, sociodemographic and traffic factors associated with fatal pedestrian road traffic accidents as well as their association with alcohol intoxication in Nairobi City, Kenya. **Materials and Methods:** This was a prospective, descriptive autopsy-based study conducted at Nairobi City Mortuary over a 12-month period from June 1, 2009, to May 31, 2010. The study received ethical approval from the University of Nairobi-Kenyatta National Hospital Ethics and Review Committee. Nairobi City Mortuary, located at the intersection of Mbagathi Way and Ngong Road, serves as the primary public mortuary in Nairobi for medicolegal autopsies. A total of 2,566 violent death cases were autopsied during the study period, all road traffic fatalities received complete postmortem examinations a systematic subsample of 400 cases was selected for alcohol testing, this is by consecutively selecting every fifth autopsy. Vitreous humor samples were analyzed using gas chromatography to determine ethanol concentration. Of the 400 cases tested, 96 were positive for alcohol. These included 50 cases due to accidents, 38 due to homicide, and 8 suicides. Of the 50 alcohol-positive accident cases, 43 were attributed to road traffic accidents and 7 to other types of accidents. Crude prevalence was calculated using a denominator of 3.7 million inhabitants, based on the 2009 Kenya National Census population for Nairobi City. Data on sociodemographic variables (age and sex), circumstances of the accident

(e.g., road type, pedestrian action), and vehicle types involved were obtained from next of kin and attending police officers. Roads were categorized as follows: Highways: Major multi-lane roads connecting Nairobi to other towns, such as Thika Road and Mombasa Road, Market Roads: Roads in or near open-air market areas with heavy pedestrian and informal traffic. City Roads: Primary roads within the central business district (CBD) and surrounding urban core, Estate Roads: Minor roads within residential neighborhoods, typically with lower speed limits, Town Roads: Roads within outlying urban centers or informal settlements within Nairobi and; Other Roads: Roads that did not clearly fall into the above categories, including access or industrial roads. Data were analyzed using SPSS version 11.5 (SPSS Inc., Chicago, IL). Descriptive statistics were generated and presented in tables. Pearson correlation tests were used to assess associations between variables, including alcohol intoxication and pedestrian fatality characteristics. **Results:** During the 12-month study period, a total of 929 fatal road traffic accidents were recorded at Nairobi City Mortuary. Of these, 436 cases (46.9%) involved pedestrians, corresponding to a crude fatality rate of 11.8 per 100,000 population, based on the 2009 Nairobi City census figure of 3.7 million. The mean age of pedestrian victims was 30 years, with a range of 10 to 59 years. The age group most affected was 30 - 39 years, accounting for 211 cases (48.4%), followed by the 20 - 29 age group with 117 cases (26.8%). There was a striking male predominance, with a male-to-female ratio of 12.6:1. Most pedestrian fatalities (75.5%) occurred while victims were crossing the road. Regarding accident locations, highways accounted for the highest proportion of incidents (25.5%), followed by market roads (22.9%), city center roads (17.2%), town roads (10.8%), and residential areas (14.6%). In 16.5% of cases, vehicles had veered off the road before striking the pedestrian. Analysis of the types of vehicles involved showed that light passenger vans (matatus) were responsible for the majority of pedestrian fatalities (35.6%), followed by buses (24.8%), trucks (21%), private cars (10.6%), and motorbikes (8%). Among the 43 alcohol-intoxicated victims of road traffic accidents sampled from the study population, 22 (51.2%) were pedestrians. The presence of alcohol was found to be significantly associated with pedestrian fatalities ( $p = 0.03$ ; 95% CI). **Conclusion:** Fatal pedestrian crashes are a major contributor to road traffic deaths in Nairobi, accounting for nearly half of all such fatalities. The victims are predominantly young males, with most incidents occurring during road-crossing attempts. Alcohol intoxication was found to be a significant associated factor, further increasing the vulnerability of this demographic. These findings highlight the urgent need to prioritize pedestrian safety through comprehensive urban road planning, improved engineering design of pedestrian walkways and crossings, and implementation of targeted road safety campaigns. In addition, stricter enforcement of traffic regulations and effective control of alcohol consumption—particularly among young men—are critical to reducing the burden of pedestrian fatalities. A multi-sectoral approach involving policymakers, urban planners, law enforcement, and public health stakeholders is essential to address the root causes and prevent these avoidable deaths.

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## Subject Areas

Sociology

## Keywords

Pedestrians Road Traffic, Fatality, Alcohol, Kenya

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## 1. Introduction

Pedestrian road traffic fatalities are a major global public health concern, constituting nearly 25% of all road traffic deaths worldwide [1]. Alarming, about 90% of these fatalities occur in Low- and Middle-Income Countries (LMICs), with the African region bearing over 40% of the total burden [2] [3]. In some African countries, pedestrians account for as much as 80% of all road traffic deaths. Sub-Saharan Africa (SSA), including Kenya, continues to experience high and rising rates of pedestrian fatalities [4] [5].

The prevalence and characteristics of pedestrian road traffic deaths vary both between and within regions. These differences are influenced by numerous factors, including the quality of road infrastructure, urban planning, population density, vehicle types and volumes, enforcement of traffic regulations, public awareness, and broader socio-economic conditions [3] [6]. Understanding these factors is essential for designing effective and context-specific interventions, including improvements in urban planning, pedestrian infrastructure, traffic law enforcement, and healthcare preparedness.

In Kenya, the burden of pedestrian deaths is disproportionately high in urban centers, particularly in Nairobi. This has been attributed to rapid urbanization, poor road design, limited pedestrian facilities, increased motorization, and a lack of traffic discipline. The state of road infrastructure across SSA, including Kenya, has been cited as a major contributing factor to the high rates of pedestrian fatalities [5] [7]. Despite this burden, few studies—particularly autopsy-based investigations—have systematically examined the sociodemographic and traffic-related patterns of fatal pedestrian crashes in the country.

This study therefore aimed to determine the prevalence of pedestrian fatalities in Nairobi and to describe the associated sociodemographic and traffic factors. Additionally, it sought to assess the role of alcohol intoxication among victims through forensic toxicological analysis. Generating such localized data is crucial to inform evidence-based strategies, policies, and interventions that improve pedestrian safety and reduce preventable deaths on urban Kenyan roads.

## 2. Materials and Methods

This was a prospective descriptive autopsy-based study carried out over a one-year period from June 1, 2009, to May 31, 2010, at Nairobi City Mortuary. The mortuary, located at the junction of Mbagathi Way and Ngong Road, is the largest

public mortuary in Nairobi and serves as the principal center for medicolegal autopsies, receiving approximately 200 bodies of each month. The study was designed to examine the prevalence and patterns of violent deaths and relationship with alcohol intoxication. Violent deaths in this context included fatalities resulting from homicide, suicide, and accidents—where accidents referred to both road traffic and other unintentional injuries. In road traffic cases, the categories of persons involved included pedestrians, drivers, passengers, and cyclists.

Ethical approval for the study was granted by the University of Nairobi-Kenyatta National Hospital Ethics and Review Committee (Ref: KNH/UON-ERC/A/196), and informed consent was obtained from the next of kin of the deceased. The prevalence of pedestrian deaths was calculated using Nairobi's population of 3.7 million, as reported in the 2009 National Census. Demographic details such as age and sex were obtained from next of kin and verified using official identification documents. Individuals were grouped into standard 10-year age bands ranging from 1 to 69 years for analytical consistency.

A total of 2,566 autopsies were conducted during the study period. From these, 929 deaths were attributed to road traffic accidents, of which 436 (46.9%) were pedestrians. To assess alcohol intoxication, a subsample of 400 cases was selected using a systematic sampling approach. Specifically, every fifth case was chosen consecutively, yielding a preliminary sample of approximately 539 individuals. From this pool, the first 400 cases were ultimately analyzed for alcohol levels. This method offered a balance between representativeness and feasibility, as full toxicological testing on all 2,566 cases was not financially or logistically viable. Systematic sampling preserved proportionality while ensuring manageable laboratory workloads.

Alcohol testing was performed using vitreous humor samples collected during postmortem examination. Ethanol levels were measured using gas chromatography (GC) with flame ionization detection (FID), in accordance with international forensic toxicology guidelines. The equipment used was a Varian Model 3700 gas chromatograph (Varian Associates, Georgetown, Ontario), employing helium as the carrier gas. Injector and detector temperatures were maintained at 100°C and 140°C respectively, and isothermal elution was used with n-propanol serving as the internal standard. A carbowax 20M high-polarity GC column facilitated accurate quantification of ethanol. Alcohol intoxication was defined as a blood alcohol concentration (BAC) exceeding 0.08 g/dL.

In the subset tested for alcohol, 43 were confirmed road traffic accident fatalities. Data were recorded on standardized data sheets and analyzed using the Statistical Package for the Social Sciences (SPSS) version 11.5. Descriptive statistics were used to generate frequencies and proportions, while Pearson correlation tests were applied to assess associations between alcohol intoxication and pedestrian fatalities, with statistical significance set at  $p < 0.05$ .

Detailed data on the site and circumstances of the accidents were obtained from accompanying police officers and case records. This included classification of the roads where accidents occurred. Roads were categorized by function and geo-

graphic context. Highways referred to major arterial roads designed for high-speed, long-distance travel, including Thika Superhighway, Mombasa Road, and Waiyaki Way. Market roads were located near high-density trading areas, typically with poor pedestrian infrastructure. City roads were found within the central business district and nearby urban zones. Estate roads were within residential neighborhoods, often with narrow lanes and slower speed limits. Town roads included those in peri-urban settlements such as Embakasi, Eastleigh, and Kibera, serving mixed residential and commercial functions. Other roads consisted of minor access paths, unpaved roads, and informal tracks, especially in industrial and peri-urban regions that did not fit into the other categories.

Additional variables included the class of vehicle involved in each fatality. This ranged from light passenger vans (matatus), buses, and trucks to private cars and motorcycles. Circumstances such as the pedestrian's activity at the time of death—most commonly road crossing—were also recorded.

This multifaceted data collection enabled an in-depth analysis of the demographic, situational, and toxicological characteristics of pedestrian fatalities in Nairobi, and provided a robust foundation for assessing the relationship between alcohol intoxication and fatal pedestrian incidents in the urban Kenyan setting.

### 3. Results

#### 3.1. Prevalence

Nine hundred and twenty-nine (929) cases of Road traffic accidents were studied. Pedestrians comprised 436(46.9%) of the cases followed by cyclists (234; 25.2%) then passengers (214; 23.0%). Drivers were least affected (45; 4.8%) (**Table 1**).

**Table 1.** Distribution of categories of road involved in fatal road traffic accidents in Nairobi, Kenya.

CATEGORY OF ROAD USER	FREQUENCY (%)
Pedestrian	436 (46.9)
Cyclist	234 (25.2)
Passenger	214 (23.0)
Drivers	45 (4.8)
TOTAL	929 (100)

The 436 cases of pedestrian fatalities translated to a crude prevalence of 11.8/100,000 inhabitants.

#### 3.2. Age and Sex Distribution

The mean age was 30.0 years (range: 10 - 59). The most frequent age group was 30 - 39 years (211; 48.4%), followed by 20 - 29 years (117; 26.8%), 40 - 49 years (82; 18.8%), 50 - 59 (20; 4.6%), the least frequent age group was 10 - 19 (6; 1.4%).

Males predominated (404; 92.7%) giving a male to female ratio of 12.6:1. This male predominance persisted in all age groups. It was highest in the 30 - 39-year

age group (22.4:1), followed by 40 - 49 (10.7:1) (**Table 2**).

**Table 2.** Age and sex distribution of pedestrians involved in fatal road traffic accidents in Nairobi, Kenya.

AGE RANGE	NUMBER/SEX			
	M	F	TOTAL	M/F RATIO
10 - 19	4	2	6 (1.4)	2:1
20 - 29	106	11	117 (26.8)	9.6:1
30 - 39	202	9	211 (48.4)	22.4:1
40 - 49	75	7	82 (18.8)	10.7:1
50 - 59	17	3	20 (4.6)	5.7:1
TOTAL	404	32	436 (100)	12.6:1

### 3.3. Circumstances of the Accident

Majority of the pedestrian fatalities resulted from pedestrians crossing the road (329; 75.5%), followed by motor vehicle veering off the road (72; 16.5%) and motor bike veering off the road (3; 58%) (**Table 3**).

**Table 3.** Circumstances of pedestrian in fatal road accident in Nairobi, Kenya.

CIRCUMSTANCES	NO. OF CASES (%)
Pedestrian crossing the road	329 (75.5)
Motor vehicle veered of the road	72 (16.5)
Motor bike veered of the road	35 (8)
TOTAL	436 (100)

### 3.4. Site of Pedestrian Road Traffic Accident

A majority of pedestrian accidents occurred on roadways. The most common site was highways (111; 22.5%), roads in markets (100; 22.9%), city center (75; 17.2%), residential areas (65; 14.9%), and towns (47; 10.8%). Off road or street settings were involved in 38 (8.7%) cases (**Table 4**).

**Table 4.** Site of pedestrian fatal road traffic accident in Nairobi, Kenya.

SITE	NUMBER OF PEDESTRIANS (%)
Highway	111 (25.5)
Market	100 (22.9)
City roads	75 (17.2)
Estates	65 (14.9)
Town Roads	47 (10.8)
Others	38 (8.7)
TOTAL	436 (100)

### 3.5. Class of Vehicle Involved

Pedestrian fatalities were largely contributed by passenger vans; matatus (155;

35.6%) followed by buses (108; 24.8%), heavy trucks (92; 21%) then personal cars (46; 10.6%). Motorbikes were the least involved (35; 8%) (**Table 5**).

**Table 5.** Class of motor vehicle involved in pedestrian road traffic accidents in Nairobi, Kenya.

CLASS OF VEHICLE	NO OF CASES (%)
Light passenger van or minibus “Matatu”	155 (35.6)
Heavy passenger bus	108 (24.8)
Heavy trucks	92 (21.0)
Personal cars	46 (10.6)
Motor bike	35 (8.0)
TOTAL	436 (100)

### 3.6. Pedestrians’ Fatalities Relationship with Alcohol Intoxication

An analyses of alcohol intoxication amongst victims of road traffic accidents revealed that of the 43 persons who were intoxicated, there were 22 (51.2%) pedestrians.

## 4. Discussion

The prevalence of pedestrian road traffic fatalities varies significantly across regions and countries, largely due to differences in socioeconomic status, infrastructure quality, traffic regulation, and road user behavior (14). Socioeconomic factors impact mobility patterns, availability and condition of pedestrian infrastructure, vehicle types, and cultural attitudes toward alcohol use and risk-taking. This study provides new evidence on the characteristics of fatal pedestrian crashes in Nairobi, highlighting patterns that have not been previously documented. These findings offer important, localized insights that can guide the development of targeted, context-appropriate interventions aimed at improving pedestrian safety and reducing preventable deaths on urban roads.

### 4.1. Prevalence

According to the World Health Organization, pedestrians account for up to 40% of global road traffic fatalities [1]. This study found an even higher figure in Nairobi, where pedestrians made up 46.9% of all road traffic deaths. This is consistent with findings from Malawi (46.5%) and South Africa (43%) [7] [8], but significantly exceeds rates reported in high-income countries such as Sweden (18%), Turkey (15.6%), Poland (30%), India (10.5%), and Pakistan [9]-[13]. Even within Sub-Saharan Africa, countries like Ghana (36.7%) and Botswana (32%) report lower proportions [14] [15], although Ethiopia shows a much higher rate of 79.8% [5].

When assessed per capita, Africa’s average pedestrian fatality rate is about 3.4 per 100,000 people [16], but Nairobi reports a much higher rate of 11.78. This

approximates the U.S. figure (12.7/100,000) but far exceeds rates in most high-income and MENA countries [17] [18]. Nairobi's elevated figures likely reflect poor infrastructure, weak enforcement, and socioeconomic vulnerabilities [3] [19] (Table 6).

**Table 6.** Proportion of fatal pedestrian road traffic accidents in various countries.

Ref	Country	Percentage proportion
Alemayehu <i>et al.</i> , 2023	Ethiopia	79.8
Amin <i>et al.</i> , 2022	Sweden	25.0
Budzynski <i>et al.</i> , 2019	Poland	30
Bullard <i>et al.</i> , 2024	Ghana	36.7
Geduld <i>et al.</i> , 2024	South Africa	43
Martinez <i>et al.</i> , 2019	Latin America & Caribbean	23.7
Mphela <i>et al.</i> , 2021	Botswana	32
Mwenda <i>et al.</i> , 2018	Kenya	36
Ngwira <i>et al.</i> , 2019	Malawi	46.5
Santa <i>et al.</i> , 2024	Hungary	34.6
Suleiman <i>et al.</i> , 2022	Türkiye	15.6
Sivasankaran <i>et al.</i> , 2019	India	10.5
Current study	Kenya	46.9

## 4.2. Age and Sex Distribution

The study found that the mean age of pedestrian fatalities was 30 years, with the 30 - 39 age group accounting for the highest proportion (48.4%) of deaths. This pattern is consistent with previous findings in Kenya, where the average age of pedestrian victims was reported at 35.7 years [20], and in the United States, where individuals aged 31 - 40 are most commonly affected [21]. These findings contrast with trends in many high-income countries, where pedestrian fatalities more frequently involve older adults. For instance, the median age in Sweden is 59.2 years, while in Spain, the most affected age group falls between 65 and 84 years [9] [22] [23].

A striking feature of this study is the overwhelming male predominance, with a male-to-female ratio of 12.6:1, reflecting similar patterns observed globally [21] [24]-[26]. This disparity may be attributed to higher male exposure to traffic environments, more frequent risk-taking behavior, and lower adherence to road safety regulations. The "Young Male Syndrome" hypothesis suggests a biological inclination among young men towards risk-taking, further increasing their vulnerability [27]. In South Africa, studies have also linked pedestrian deaths among men to poor compliance with traffic laws [28]. These findings underscore the importance of targeting young men in pedestrian safety campaigns and enforcement strategies.

### 4.3. Site and Circumstances of the Accident

In this study, a significant majority—76.4%—of pedestrian fatalities occurred on highways and major roads. This aligns with global findings showing that high-speed roads pose a heightened risk to pedestrians due to fast-moving traffic and limited crossing infrastructure [29]. Similar patterns have been observed across various regions, including Africa, Europe, the Middle East, and Asia, where high-traffic arterial roads are consistently associated with increased pedestrian mortality [9] [23] [30]-[32]. Over three-quarters of victims were struck while attempting to cross the road, reaffirming the global trend that road crossings are among the most hazardous pedestrian activities [30] [33].

Additionally, 16.5% of the fatalities involved vehicles veering off the road, highlighting infrastructural deficiencies such as the lack of adequate sidewalks or protective pedestrian barriers. Research shows that incorporating physical infrastructure—like rail guards, bollards, and designated footpaths—can substantially reduce the severity and frequency of pedestrian injuries [15] [18].

Residential estates and off-road areas accounted for nearly 24% of the fatal cases. This proportion mirrors U.S. data, where approximately 12% of pedestrian crashes occur in residential neighborhoods [29], with up to half of such incidents taking place near the victim's home [16]. These findings illustrate that pedestrian risk is not confined to highways; it is also prevalent in community settings. This underscores the importance of implementing localized safety measures, such as traffic calming devices, safe pedestrian crossings, reduced speed limits, and improved neighborhood planning, to enhance pedestrian safety in both high-traffic and residential environments [25].

### 4.4. Class of Vehicle Involved

Light passenger vans, commonly known as matatus, were implicated in 35.6% of pedestrian fatalities in this study. Although other research more frequently identifies heavy vehicles, SUVs, and trucks as major contributors to pedestrian deaths [26] [31] [33], the prominence of matatus in Nairobi's public transport system likely accounts for their high involvement. These vehicles dominate the city's urban mobility landscape but are often associated with poor regulation, aggressive driving behaviors, frequent traffic violations, and chaotic route management [4].

The high fatality rate linked to matatus underscores the urgent need for targeted interventions in this sector. Effective mitigation strategies should include stringent regulatory reforms, mandatory and standardized driver training programs, and better enforcement of traffic laws. Additionally, rationalized route planning and the creation of dedicated lanes for public transport vehicles could help reduce pedestrian exposure, particularly in crowded urban corridors. Prioritizing these changes in high-density pedestrian zones could significantly enhance road safety [34].

### 4.5. Relationship with Alcohol Intoxication

In this study, over half of the pedestrian fatalities (51.2%) tested positive for alco-

hol—a figure significantly higher than reported in many other regions. For comparison, studies from Finland recorded alcohol involvement in 19.9% of pedestrian deaths, while the U.S. and South Africa reported even lower rates of approximately 22.35% and 6.4%, respectively [7] [23] [29]. This disparity is striking and raises critical concerns about the role of alcohol in pedestrian road traffic fatalities in Nairobi.

Alcohol consumption is widely recognized as a major risk factor for pedestrian injuries and fatalities. Intoxicated pedestrians are more likely to misjudge traffic gaps, walk unpredictably, and cross roads in unsafe locations, especially in high-speed or poorly lit areas [32] [33]. The high prevalence of alcohol among victims in this study likely reflects the demographic profile of the affected population—predominantly young males—who are both more likely to consume alcohol and engage in risky road-use behaviors.

Given this pattern, addressing alcohol-related pedestrian deaths requires a multifaceted approach. Strategies may include restricting the sale and consumption of alcohol in high-risk urban zones, particularly near busy roads or public transport hubs. Public education campaigns can also raise awareness about the dangers of walking while intoxicated, especially targeting young adults. Moreover, stricter enforcement of existing laws concerning alcohol use, including random breath testing and penalties for intoxicated pedestrians and drivers, could help deter risky behavior. Ultimately, integrating behavioral, legal, and environmental interventions is key to reducing alcohol-related pedestrian fatalities in Nairobi.

#### 4.6. Limitations

While this study offers valuable insights into pedestrian fatalities in Nairobi, it has several limitations. Firstly, it was based on data from a single mortuary. Although this facility serves a large portion of the city, the findings may not reflect pedestrian deaths occurring in other regions or rural settings. Secondly, alcohol testing was conducted on only a subset of cases due to resource constraints. This may have led to either underestimation or overestimation of alcohol involvement among victims. Thirdly, the study lacked detailed contextual information such as time of day, lighting conditions, weather, and driver behavior—factors that could provide deeper understanding of crash dynamics. Lastly, the cross-sectional design limits the ability to draw causal inferences. Despite these constraints, the study contributes critical local evidence. Future research should incorporate data from multiple sites, include broader samples, and apply longitudinal designs to improve generalizability and identify causal patterns in pedestrian fatalities.

#### 4.7. Conclusion

Pedestrian fatalities represent a significant share of road traffic deaths in Nairobi, accounting for nearly half of all such incidents. This high prevalence underscores a serious public health and urban planning challenge. The study revealed that young adult males are disproportionately affected, suggesting a vulnerable demographic shaped by greater exposure to traffic, risk-taking behavior, and frequent

alcohol use. Most of these fatal crashes occurred during road crossings along major highways and high-speed roads—locations typically lacking adequate pedestrian infrastructure such as safe crossings, barriers, or footpaths.

Additionally, a substantial proportion of fatalities involved intoxicated victims, highlighting alcohol use as a critical risk factor. The combination of risky pedestrian behavior, poor road design, and insufficient enforcement creates a hazardous urban environment, particularly for those in socioeconomically disadvantaged areas.

To effectively reduce pedestrian deaths, a comprehensive and multi-sectoral response is essential. Priorities should include redesigning road infrastructure to accommodate pedestrian needs, such as constructing footbridges, marked crosswalks, and barriers separating pedestrians from fast-moving traffic. There is also a pressing need to regulate and monitor public transport vehicles—especially matatus—through improved driver training, route planning, and enforcement of traffic rules.

Targeted public education campaigns focusing on young males can raise awareness about road safety and the dangers of alcohol impairment. Simultaneously, enforcing alcohol control measures and ensuring pedestrian protection in residential and off-street settings will help create safer walking environments. Ultimately, a holistic and sustained approach involving urban planners, law enforcement, transport authorities, and community stakeholders is vital to improve pedestrian safety in Nairobi.

## Conflicts of Interest

The author declares no conflicts of interest.

## References

- [1] Abou-Senna, H., Radwan, E. and Mohamed, A. (2022) Investigating the Correlation between Sidewalks and Pedestrian Safety. *Accident Analysis & Prevention*, **166**, Article 106548. <https://doi.org/10.1016/j.aap.2021.106548>
- [2] Adeloje, D., Thompson, J.Y., Akanbi, M.A., Azuh, D., Samuel, V., Omoregbe, N., *et al.* (2016) The Burden of Road Traffic Crashes, Injuries and Deaths in Africa: A Systematic Review and Meta-Analysis. *Bulletin of the World Health Organization*, **94**, 510-521A. <https://doi.org/10.2471/blt.15.163121>
- [3] Afridi, A., Shahzad, H., Akhter, J., Nouman, M., Hussain, S., Ullah, R., *et al.* (2021) Trends of Road Traffic Accident Victims: A Study from Lady Reading Hospital MTI, Peshawar, KPK. *Pakistan Journal of Medical and Health Sciences*, **15**, 2194-2198. <https://doi.org/10.53350/pjmhs211582194>
- [4] Alemayehu, M., Woldemeskel, A., Olani, A.B. and Bekelcho, T. (2023) Epidemiological Characteristics of Deaths from Road Traffic Accidents in Addis Ababa, Ethiopia: A Study Based on Traffic Police Records (2018-2020). *BMC Emergency Medicine*, **23**, Article No. 19. <https://doi.org/10.1186/s12873-023-00791-0>
- [5] Vipul N, A., Sirsat Kunal, B. and Sharma, M. (2021) Pattern of Injuries in Different Types of Victims of Road Traffic Accident in Central India: A Comparative Study. *Journal of Forensic Science and Research*, **5**, 7-11.

- <https://doi.org/10.29328/journal.jfsr.1001021>
- [6] Amin, K., Skyving, M., Bonander, C., Krafft, M. and Nilson, F. (2022) Fall- and Collision-Related Injuries among Pedestrians in Road Traffic Environment—A Swedish National Register-Based Study. *Journal of Safety Research*, **81**, 153-165. <https://doi.org/10.1016/j.jfsr.2022.02.007>
- [7] Babalola, O.O. (2024) Pedestrian Road Traffic Accidents in the USA, Is Age a Crash Outcome Determinant? *International Journal of Advanced Community Medicine*, **7**, 39-44. <https://doi.org/10.33545/comed.2024.v7.i4a.348>
- [8] Budzynski, M., Jamroz, K. and Mackun, T. (2017) Pedestrian Safety in Road Traffic in Poland. *IOP Conference Series: Materials Science and Engineering*, **245**, Article 042064. <https://doi.org/10.1088/1757-899x/245/4/042064>
- [9] Bullard, C., Adanu, E.K., Liu, J., Agyemang, W. and Jones, S. (2024) Segmenting and Investigating Pedestrian-Vehicle Crashes in Ghana: A Latent Class Clustering Approach. *African Transport Studies*, **2**, Article 100010. <https://doi.org/10.1016/j.aftran.2024.100010>
- [10] Geduld, H., Sinclair, M., Steyn, E. and Chu, K. (2024) Road Traffic Injuries in South Africa: A Complex Global Health Crisis. *Annals of Global Health*, **90**, Article 26. <https://doi.org/10.5334/aogh.4249>
- [11] Glele-Ahanhanzo, Y., Kpozehouen, A., Sossa-Jerome, C., Sopoh, G.E., Tedji, H., Yete, K., *et al.* (2021) “My Right to Walk, My Right to Live”: Pedestrian Fatalities, Roads and Environmental Features in Benin. *BMC Public Health*, **21**, Article No. 162.
- [12] Hasanat-E-Rabbi, S., Raihan, M.A., Mahmud, S.M.S. and Hoque, M.S. (2022) Pedestrian Injury Outcomes in the Developing Urban Metropolis: Econometric Models for Assessing Risk Factors. *IATSS Research*, **46**, 269-280. <https://doi.org/10.1016/j.iatssr.2022.01.002>
- [13] Suleiman, G., Dahamsheh, A.M. and Ergun, M. (2020) Assessment of Fatal Road Traffic Crashes in Turkey. *International Journal of Safety and Security Engineering*, **10**, 733-737. <https://doi.org/10.18280/ijssse.100602>
- [14] Hashemi Nazari, S., Hasani, J., Ahanchi, N., Rajabi, A. and Ghadirzadeh, M. (2017) An Epidemiologic Study of Deceased Pedestrians in Road Traffic Accidents in Iran during 2012-2013. *Archives of Trauma Research*, **6**, 63-68. [https://doi.org/10.4103/atr.atr\\_57\\_17](https://doi.org/10.4103/atr.atr_57_17)
- [15] Hu, W., Monfort, S.S. and Cicchino, J.B. (2024) The Association between Passenger-Vehicle Front-End Profiles and Pedestrian Injury Severity in Motor Vehicle Crashes. *Journal of Safety Research*, **90**, 115-127. <https://doi.org/10.1016/j.jfsr.2024.06.007>
- [16] Hu, W. and Cicchino, J.B. (2022) Relationship of Pedestrian Crash Types and Passenger Vehicle Types. *Journal of Safety Research*, **82**, 392-401. <https://doi.org/10.1016/j.jfsr.2022.07.006>
- [17] Kumar, A. and Ghosh, I. (2022) Non-Compliance Behaviour of Pedestrians and the Associated Conflicts at Signalized Intersections in India. *Safety Science*, **147**, Article 105604. <https://doi.org/10.1016/j.ssci.2021.105604>
- [18] Kakhani, A., Jalayer, M., Kidando, E., Roque, C. and Patel, D. (2024) Identifying Contributing Factors and Locations of Pedestrian Severe Crashes Using Hazard-Based Duration Model. *Accident Analysis & Prevention*, **198**, Article 107500. <https://doi.org/10.1016/j.aap.2024.107500>
- [19] Malin, F., Silla, A. and Mladenović, M.N. (2020) Prevalence and Factors Associated with Pedestrian Fatalities and Serious Injuries: Case Finland. *European Transport*

- Research Review*, **12**, Article No. 29. <https://doi.org/10.1186/s12544-020-00411-z>
- [20] Martinez, S., Sanchez, R. and Yañez-Pagans, P. (2019) Road Safety: Challenges and Opportunities in Latin America and the Caribbean. *Latin American Economic Review*, **28**, Article No. 17. <https://doi.org/10.1186/s40503-019-0078-0>
- [21] Marzbani, B., Moradinazar, M., Marzbani, B., Rajati, F., Khezeli, M., Ramazani, Y., *et al.* (2024) Epidemiological Aspects of Road Accidents in the Middle East and North Africa (MENA) Countries from 1990 to 2019. *Middle East Journal of Rehabilitation and Health Studies*, **12**, e147548. <https://doi.org/10.5812/mejrh-147548>
- [22] Minas-Alexander, R., Hashem, E., Jones, A. and Hannon, M. (2025) Automobile-pedestrian Injuries: Are Pedestrian Safety Features Associated with Injury Severity? *Journal of Surgical Research*, **305**, 126-130. <https://doi.org/10.1016/j.jss.2024.11.011>
- [23] Modipa, M. (2024) Pedestrian Safety in South Africa: A Comprehensive Analysis. *E-Journal of Humanities, Arts and Social Sciences*, **5**, 3489-3499. <https://doi.org/10.38159/ehass.202451664>
- [24] Mphela, T., Mokoka, T. and Dithole, K. (2021) Pedestrian Motor Vehicle Accidents and Fatalities in Botswana—An Epidemiological Study. *Frontiers in Sustainable Cities*, **3**, Article 666111. <https://doi.org/10.3389/frsc.2021.666111>
- [25] Muguro, J.K., Sasaki, M., Matsushita, K. and Njeri, W. (2020) Trend Analysis and Fatality Causes in Kenyan Roads: A Review of Road Traffic Accident Data between 2015 and 2020. *Cogent Engineering*, **7**, Article 1797981.
- [26] Mwenda, V., Gathecha, G., Kibachio, J. and Gura, Z. (2018) Epidemiology of Road Traffic Crash Fatalities, Kenya 2017. *Injury Prevention*, **24**, A9-1-A9.
- [27] Naumann, R.B., West, B.A., Barry, V., Matthews, S. and Lee, R. (2025) Pedestrian and Overall Road Traffic Crash Deaths—United States and 27 Other High-Income Countries, 2013–2022. *Morbidity and Mortality Weekly Report*, **74**, 134-139. <https://doi.org/10.15585/mmwr.mm7408a2>
- [28] Ngwira, G.M., Bolaane, B. and Parida, B.P. (2019) Road Traffic Fatalities in Malawi: The Role of Pedestrian Behaviour Factors. *Journal of the Australasian College of Road Safety*, **30**, 48-54. <https://doi.org/10.33492/jacrs-d-18-00297>
- [29] O'Hern, S., Utriainen, R., Tiikkaja, H., Pöllänen, M. and Sihvola, N. (2021) Exploratory Analysis of Pedestrian Road Trauma in Finland. *Sustainability*, **13**, Article 6715. <https://doi.org/10.3390/su13126715>
- [30] Onieva-García, M.Á., Martínez-Ruiz, V., Lardelli-Claret, P., Jiménez-Moleón, J.J., Amezcua-Prieto, C., de Dios Luna-del-Castillo, J., *et al.* (2016) Gender and Age Differences in Components of Traffic-Related Pedestrian Death Rates: Exposure, Risk of Crash and Fatality Rate. *Injury Epidemiology*, **3**, Article No. 14. <https://doi.org/10.1186/s40621-016-0079-2>
- [31] Sánta, E., Szűcs, P., Patocskai, G. and Lakatos, I. (2024) Prevalence and Characteristics of Traffic Accidents Endangering Vulnerable Pedestrians in Hungary. *Engineering Proceedings*, **79**, Article 94. <https://doi.org/10.3390/engproc2024079094>
- [32] Sivasankaran, S.K. and Balasubramanian, V. (2020) Investigation of Factors Contributing to Pedestrian Hit-and-Run Crashes in India. *Journal of Transportation Safety & Security*, **14**, 382-403. <https://doi.org/10.1080/19439962.2020.1781313>
- [33] Stigson, H., Klingegård, M. and Kullgren, A. (2023) How to Reduce Pedestrian Fatalities: A Case-by-Case Study to Evaluate the Potential of Vehicle and Road Infrastructure Interventions. *Traffic Safety Research*, **5**, e000023. <https://doi.org/10.55329/rdja1963>

- [34] Sukhai, A., Govender, R. and van Niekerk, A. (2021) Fatality Risk and Issues of Inequity among Vulnerable Road Users in South Africa. *PLOS ONE*, **16**, e0261182. <https://doi.org/10.1371/journal.pone.0261182>