Research Square

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Trauma Epidemiology, Injury mechanisms, and Severity Among Adults Presenting at Tertiary Hospitals in Eastern Uganda: A cross-sectional study

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Abstract

Background

Data on the burden and characteristics of trauma in Uganda is scarce, despite rising injury rates and inadequate emergency care systems. This study aims to characterise the sociodemographic and clinical characteristics of trauma patients and identify common mechanisms of injury presenting at two tertiary hospitals in Eastern Uganda.

Methods

A hospital-based cross-sectional study was conducted between October and December 2025 at Jinja Regional Referral Hospital and Iganga General Hospital. Data were collected prospectively using a structured questionnaire administered by trained research assistants in emergency departments. Information on socio-demographic and clinical characteristics, injury mechanisms, and severity was collected. Chi-square or Fisher's exact tests were used to assess associations between demographic variables and injury mechanisms.

Results

A total of 397 trauma patients were enrolled, with a mean age of 35.41 years (SD: 15.01), and the majority were male (n = 284, 71.54%). Most injuries occurred on roads (66.0%) and were unintentional (85.6%). The most common injury was road traffic injury (n = 261, 65.74%), predominantly from motorcycle-related accidents (n = 179/261, 68.58%), followed by blunt trauma (n = 48, 12.1%) and falls (n = 43, 10.8%). Other than burns, all reported injuries were more common in males than in females. Head injury (n = 164, 41.3%) and fractures (n = 162, 40.8%) were the most common diagnoses. Most injuries were classified as moderate (n = 246, 62.0%) as per the Kampala Trauma Score (KTS).

Conclusions

Road traffic injuries are a major cause of trauma in Eastern Uganda, primarily resulting from motorcycle collisions, leading to head injuries, and disproportionately affecting young males. Improvements in road traffic safety, helmet use compliance, and prehospital emergency systems are urgent priorities to reduce the region's trauma-related burden.

Background

Trauma is a leading cause of mortality and morbidity, causing approximately 4.4 million deaths each year and accounting for nearly 8% of global mortality [1, 2]. Low- and middle-income countries (LMICs) face a disproportionate burden, accounting for about 90% of trauma-related deaths [2]. In sub-Saharan

Africa (SSA), road traffic injuries (RTIs) are the most common cause of trauma-related mortality, reaching up to 65.2 deaths per 100,000 people [3]. Uganda bears one of the highest trauma burdens in SSA, with 19,543 injury-related deaths in 2021 [4].

Trauma accounted for 17% of the 133,925 emergency cases recorded in 2023 across 74 health facilities in Uganda, including tertiary referral hospitals and lower-level health centres [5]. This is particularly severe in cities in Eastern Uganda situated along the Northern Corridor, a major trade route and the busiest transit highway in East Africa [5]. Studies show that falls and RTIs, mostly involving motorcycles ("Boda-Bodas"), are the most common causes of trauma in Uganda [6–8].

This trauma burden is exacerbated by severe systemic challenges, including poor road infrastructure, weak traffic law enforcement, and limited access to both prehospital and hospital trauma care [9, 10]. Despite this clear public health challenge, the trauma burden remains underreported in Uganda, and region-specific data on trauma remains fragmented, especially in underserved areas in the Eastern region. The Eastern region of Uganda is rapidly urbanising, and the population growth and traffic congestion are likely to drive an increase in trauma incidences.

Therefore, characterising regional demographic, clinical, and injury-mechanism patterns is important for identifying high-risk populations, informing targeted prevention strategies, and guiding context-specific resource allocation to improve patient outcomes. To address this critical gap, this study examined the sociodemographic and clinical characteristics, as well as injury mechanisms, among trauma patients presenting to Jinja Regional Referral Hospital and Iganga General Hospital, tertiary referral centres in Eastern Uganda.

Methods

Study Design and Setting

This was a hospital-based quantitative cross-sectional study of trauma patients conducted between October and December 2025 at Jinja Regional Referral Hospital (JRRH) and Iganga General Hospital (IGH) in Eastern Uganda. These two public referral hospitals are located along the Northern Corridor highway linking Uganda, Kenya, and Tanzania, a major transport route associated with a high burden of road traffic crashes in the region. Although private hospitals are an alternative for patients with health insurance, only 0.5% of Uganda's population has health insurance [11]. JRRH is a 600-bed hospital located in the centre of Jinja city, about 80 kilometres east of Kampala, the capital city. It serves a population of approximately 4.5 million people from Jinja and surrounding areas, including Iganga, Mayuge, Bugiri, Kamuli, Buikwe, Lugazi, Kayunga, and Mukono districts. IGH is a 150-bed hospital located about 40 kilometres northeast of JRRH, serving Iganga District and parts of Luuka, Mayuge, Bugiri, Namutumba, and Kaliro.

Study Population

Adult patients presenting with acute trauma to either hospital during the study period were eligible for inclusion.

Inclusion Criteria

- Adults 18 years and above.
- Patients with any trauma or injury (including RTIs, burns, falls, assaults).

Exclusion

- Patients who declined participation.
- Critically ill patients for whom no proxy respondent was available.

Sample Size

Sample size was determined using the Kish Leslie formulae for cross-sectional studies; $N = Z^2 \times p\,(1 - p) / d^2$; where, N = estimated sample; Z = Z score for 95% confidence interval = 1.96; P = proportion of road traffic injuries from a Ugandan perspective trauma registry was 35% [6]; d = acceptable margin of error, 5%. The calculated sample size was 354, which we adjusted to 394 participants to account for a 10% non-response rate.

Data Collection Tool

Data were collected using a tool developed from validated questionnaires adapted and modified from similar studies in the literature [6,12–14]. The tool was pre-tested at another hospital in the same setting to ensure it was relevant and comprehensible. The questionnaire collected information on participants' demographic characteristics (age, sex, occupation, residence), mechanism of injury (RTI, fall, assault, burns), and clinical data (Glasgow Coma Scale, anatomical site of injury, injury severity using the Kampala Trauma Score).

Data Collection Procedures

Data were collected prospectively by trained research assistants (nurses and intern doctors) working at the emergency departments of the study facilities during the study period. Upon arrival of a trauma patient, clinical care was prioritised. Research assistants only approached the patient after they had been clinically stabilised and were able to participate before discharge, if admitted. The research assistant introduced the study, explained its purpose, procedures, and voluntary nature in the participant’s preferred language to both the participant and their caretakers, and obtained the participant's informed consent. Following consent, the assistant administered a structured questionnaire. Where necessary, clinical information (e.g., injury scores, vitals, treatment) was abstracted from medical records to complement patient or caregiver responses. For patients who were unable to respond at presentation, information was obtained from caregivers or accompanying responders, and deferred consent was sought once the patient was clinically stable. All eligible trauma

patients presenting during the study period were recruited consecutively until the target sample size was achieved.

Data Management & Analysis

Data were collected electronically using KoboCollect (KoBoToolbox, Harvard Humanitarian Initiative, Cambridge, MA, USA) and exported to Stata Version 15 (StataCorp. Stata Statistical Software: Release 15. College Station, TX: StataCorp LLC; 2017) for analysis. Descriptive statistics were used to summarize sociodemographic characteristics, injury mechanisms, and injury severity categories. Continuous variables were summarized using means and standard deviations or medians and interquartile ranges, as appropriate, while categorical variables were summarized using frequencies and percentages. Associations between demographic variables and injury mechanisms were assessed using chi-square or Fisher's exact tests, with $p<0.05$ considered statistically significant.

Results

Sociodemographic characteristics of trauma patients

We surveyed 397 trauma patients with a mean age of 35.41 years (SD = 15.01), most aged 18–29 years (n=168, 42.32%). The majority were male (n=284, 71.54%) and unemployed (n=98, 24.69%), as shown in **Table 1**.

Table 1: Sociodemographic characteristics of trauma patients (N=397)

Variable	Frequency (%)
Age Mean (SD)	35.41 (15.01)
18 – 29	168 (42.32)
30 – 44	132 (33.25)
45 – 59	63 (15.87)
≥ 60	34 (8.56)
Sex	
Male	284 (71.54)
Female	113 (28.46)
Occupation	
Unemployed	98 (24.69)
Peasant Farmer	84 (21.16)
Student/Pupil	66 (16.62)
Motorcyclist	54 (13.60)
Self-employed	46 (11.59)
Civil servant	20 (5.04)
Other	29 (7.30)

Mechanisms and characteristics of injuries of trauma patients

The most common injuries were road traffic injuries (RTI) (n=261, 65.74%). Other frequently observed mechanisms included blunt trauma (n=48, 12.09%) and falls (n=43, 10.83%). About two-thirds of RTIs (n=189/261, 72.41%), most of blunt trauma (n=39/48, 81.25%), falls (n=28/43, 65.12%), cut wounds (n=11/17, 64.71%), and all stabbing injuries (n=16, 100%) were reported among males. **Figure 1**. Burn injuries were the only injury mechanism more common among females (n=7/10, 70%, p = 0.007). The rate of falls was highest among participants aged 18-29 years (n=20/43, 46.51%, p = 0.001). **Supplementary tables 1 and 2**.

Injuries most commonly occurred on roads/streets (n=262; 66.0%) and were predominantly unintentional (n=340; 85.6%). Most patients arrived at the health facility by motorcycle (187, 47.10%). Among RTI patients (n=261), most injuries involved motorcycle crashes, mainly motorcycle–motorcycle (n=73, 28.0%) and motorcycle–pedestrian collisions (n=57, 21.8%). **Table 2**.

Table 2: Injury characteristics of trauma patients (N=397)

Variable	Frequency (%)
Injury Setting	
Road/street	262 (65.99)
Home	71 (17.88)
Work	50 (12.59)
School	7 (1.76)
Other	7 (1.76)
Intent of Injury	
Unintentional	340 (85.64)
Assault	47 (11.84)
Mob justice	7 (1.76)
Self-harm	3 (0.76)
Road user category among RTI patients (n=261)	
Driver	105 (40.23)
Passenger	105 (40.23)
Pedestrian	51 (19.54)
Type of collision for RTI (n=261)	
Motorcycle–motorcycle collision	73 (27.97)
Motorcycle-pedestrian collision	57 (21.84)
Single-vehicle car crash	55 (21.07)
Motorcycle–car collision	49 (18.77)
Car-Car Collision	17 (6.51)
Other	10 (3.83)
Means of arrival at the facility	
Motorcycle	187 (47.10)
Private vehicle	88 (22.17)
Ambulance	64 (16.12)
Police vehicle	30 (7.56)
Taxi	15 (3.78)

On foot	13 (3.27)

RTI: Road Traffic Injury

Clinical characteristics and injury severity of trauma patients

The most frequently injured body regions were the lower extremities (n=180, 45.34%) and the head or neck (n=176, 44.33%). Nearly half of patients sustained multiple serious injuries (n=190, 47.86%). The most common clinical diagnoses were head injury (n=164, 41.31%) and fractures (n=162, 40.81%). Blood transfusion was required in 47 patients (11.84%). Based on the Kampala Trauma Score [14], most injuries were classified as moderate (n=246, 61.96%), and only 11 (2.77%) were severe. **Table 3**.

Table 3: Clinical characteristics of injured patients

Variable	Frequency (%)
Injured body part	
Lower extremity	180 (45.34)
Head/neck	176 (44.33)
Upper extremity	105 (26.45)
Face	91 (22.92)
Chest	47 (11.84)
Abdomen	28 (7.05)
Pelvis/perineum	14 (3.53)
Back/spinal cord	8 (2.02)
Other	3 (0.76)
Number of serious Injuries	
Multiple	190 (47.86)
One	192 (48.36)
None	15 (3.78)
Diagnosis	
Head injury	164 (41.31)
Fracture	162 (40.81)
Soft tissue injury	116 (29.22)
Bruise	77 (19.40)
Laceration	59 (14.86)
Abrasion	37 (9.32)
Thoracic injury	22 (5.54)
Abdominal injury	19 (4.79)
Bite	10 (2.52)
Burn	10 (2.52)
Dislocation	9 (2.27)
Spinal cord injury	7 (1.76)
Other	16 (4.03)

Transfused	
Yes	47 (11.84)
No	350 (88.16)
Injury Severity []	
Mild	140 (35.26)
Moderate	246 (61.96)
Severe	11 (2.77)
[] Calculated using the Kampala Trauma Score (KTS) [14] (MacLeod et al., 2003); Multiple responses were possible for injured body part and diagnosis; therefore, percentages may exceed 100%.	

Discussion

This study examined sociodemographic and clinical characteristics of trauma patients in Eastern Uganda, where information on trauma care and emergency incidents is scarce. The most common injury was RTIs, predominantly from motorcycle-related collisions occurring on roads and streets. Blunt trauma and falls were also frequent mechanisms of injury. Furthermore, most RTIs, blunt trauma, falls, cut wounds, and all stabbing injuries were reported among males, while burn injuries were more common among females.

Most of the trauma patients were young adults aged 18–29 years, reflecting Uganda's predominant age distribution with 18.3% of the population within the age range of 20–29 years [15]. High exposure of trauma burden in the most economically productive age group has significant implications for financial loss, long-term disability, health systems, and disruption of families.

This study showed that males accounted for most injury mechanisms, although only a few sex-specific differences were statistically significant. Males disproportionately comprised two-thirds of RTIs (72.41%), most of blunt trauma (81.25%), and all stabbing injuries (100%). This pattern aligns with other studies that report a higher injury risk in males than in females [16–18]. This could be explained by the socio-cultural contexts and gender norms that create variability in the risk for trauma. Furthermore, blunt trauma and stabbing injuries more commonly occur among men due to their higher exposure to high-risk activities, dangerous work environments, and violence [19]. In addition, only 2% of Boda-Boda drivers in Kampala, Uganda, were women, highlighting the significantly lower female participation in transport and, consequently, the lower risk of road traffic accidents [20]. On the other hand, burn injuries were significantly more common among females (70%). This aligns with other studies reporting higher burn-related risks and mortality among women [21–23]. This could also be attributed to gender roles, such as cooking, which is the most common activity associated with burn occurrence [16]. These findings show

the importance of understanding how cultural and domestic norms influence injury epidemiology to inform prevention strategies.

In this study, RTIs accounted for the majority (65.74%) of the injuries. These findings align with broader literature from SSA of high RTI rates and significant rates of mortalities and morbidities, with a pooled estimated rate of 65.2 deaths per 100,000 population [3]. Most RTIs resulted from motorcycle-related crashes, particularly motorcycle-to-motorcycle (27.97%) and motorcycle-to-pedestrian (21.84%) collisions. This aligns with studies conducted in other regions of Uganda [24, 25]. Furthermore, a study showed that motorcycle-related RTIs in Uganda increased steadily from 24.5% in 2009 to 33.9% in 2017 [26]. This could be due to the expansion of Boda-Boda transport, closely linked to job scarcity and inadequate public transportation systems. Boda-Boda driving has become a prevalent means for tens of thousands of civilians to make a living, from taking children to school and people to work to delivering groceries and patients to hospitals [27]. Despite their critical role in society, road safety remains challenging due to the overwhelming number of Boda-Bodas, exacerbated by reckless driving, poor road conditions, and noncompliance with traffic and road safety rules [28]. As traffic densities continue to increase, road traffic accidents pose an increasingly alarming threat to public health in settings with inadequate emergency response systems. Therefore, strict measures and interventions should be instituted to curb the imminent threat.

Interestingly, the most common mode of arrival at a health facility was by motorcycle (47.10%), whereas ambulances transported only 16.12% of participants. A major challenge in emergency systems in LMICs is transport; there are insufficient numbers of professional emergency transport vehicles, such as ambulances, and patients often lack the means to pay for transport [29]. When trauma incidents occur, before even receiving help at hospitals, people struggle to make it to healthcare facilities, and this problem is more extensive in rural areas. However, Boda-Boda riders can provide rapid and accessible transport during emergencies.

Regarding clinical characteristics of trauma patients, most injuries were moderate (61.96%), and only 11 (2.77%) were severe. Yet, nearly half of the patients sustained multiple serious injuries, suggesting clinical complexity even among these moderate cases. This is important because even moderate injuries can still require high-level care and long-term follow-up. Multiple injuries (polytrauma) have been linked with longer recovery times and increased utilization of hospital resources [30]. Forty-seven (11.84%) patients in this study required a blood transfusion. Transfusions replace lost blood from trauma or surgery, serious treatments, or supply patients with dangerously low levels of blood, reflecting the severity of trauma-induced haemorrhagic complications. Among preventable deaths, a major cause is uncontrolled haemorrhages within six hours of the incident [31]. To ensure rapid and adequate access to and delivery of blood during critical resuscitation, timely blood transfusions require efficient coordination and preparedness among the emergency department, the blood bank, and clinical staff [31]. Therefore, hospitals should be well-equipped with resources, including specialties and trained lower-cadre professionals who can recognise and handle severe cases of trauma to improve patient outcomes.

The lower extremities were the most frequently injured body region (45.34%), followed by the head or neck (44.33%). This distribution aligns with motorcycle-related trauma patterns; road traffic incidents put both riders and pedestrians at risk of limb fractures and head injuries [24, 25, 28]. However, in terms of clinical diagnoses, traumatic head injury (41.31%) was the most common diagnosis. This is similar to another study that reported head injuries were common in trauma patients [32]. This neurological involvement reveals the need for adequate cervical spine stabilisation during first response and preventive interventions such as improved helmet compliance. Studies have previously shown that wearing helmets could reduce the risk of head injuries for motorcyclists by 69% and reduce the risk of death by 42% [33]. Yet, in a Kampala roadside observation study, less than 1% of passengers and around 30.8% of Boda-Boda drivers wore helmets [34]. Given that drivers and passengers made up most of the victims of the RTIs in this study, strengthening legislation regarding safety measures like helmet legislation and public awareness campaigns could alleviate morbidity and mortality burdens.

Study Strength and Limitations

The study had several strengths. It was conducted at two major tertiary public referral facilities, enhancing the relevance of findings to trauma care in Eastern Uganda. The use of standardized and validated tools strengthened the reliability and comparability of clinical and severity assessments. In addition, data were collected by trained clinical personnel within emergency departments, minimizing misclassification and improving the accuracy of injury mechanisms and clinical characteristics. However, it also had several limitations. As a cross-sectional study, causal relationships between demographic or clinical factors and injury outcomes could not be established. The hospital-based design underrepresents prehospital deaths and minor injuries that did not present to public facilities, potentially limiting generalizability to the broader community. Selection bias may also have occurred, as patients with health insurance may have sought care in private facilities. Additionally, some information, particularly regarding injury circumstances, relied on patient or caregiver recall, which may be subject to recall bias. Despite these limitations, the study provides valuable context-specific evidence to inform trauma prevention and health system strengthening in Eastern Uganda.

Conclusion

Trauma in Eastern Uganda predominantly affects young males, with road traffic injuries, particularly from motorcycle-related crashes, accounting for the majority of cases. Most injuries occurred on roads and streets, were unintentional, and frequently involved head injuries, revealing persistent gaps in road safety and protective practices. Although most injuries were classified as moderate, the high prevalence of multiple injuries and the need for interventions such as blood transfusion show substantial clinical complexity and demand on health services from the trauma cases. These findings emphasize the need for targeted road safety interventions, strengthened enforcement of helmet use, and improved emergency transport and trauma care capacity.

Abbreviations

GCS Glasgow Coma Scale

IGH Iganga General Hospital

JRRH Jinja Regional Referral Hospital

KST Kampala Trauma Score

LMICs Low- and middle-income countries

RTIs Road traffic injuries

SSA Sub-Saharan Africa

Declarations

Ethics approval and consent to participate

The study received ethical approval from the Busitema University Faculty of Health Sciences Research Ethics Committee (BUFHS-REC), with approval number BUFHS-2025-89, and from the Uganda National Council of Science and Technology (UNCST), with approval number HS6754ES. Additional permission was obtained from the city and district health offices of Jinja City and Iganga District, and from the hospital directors of JRRH and IGH. All participants were enrolled in the study after obtaining informed consent. They were told that participation was voluntary and that they could withdraw at any time. The study was conducted in accordance with the Declaration of Helsinki.

Consent for publication

Not applicable

Availability of data and material

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

All authors made substantial contributions to the manuscript. JSP, SL, and AMK conceptualised and designed the study protocol. ESN, EM, YM, TM, MM, HN, and SK participated in the data collection. JSP and AMK analysed the data. JSP, SL, and AMK drafted the original manuscript. All authors reviewed and approved the final manuscript.

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References

1. Roth GA, Abate D, Abate KH, Abay SM, Abbafati C, Abbasi N, et al. Global, regional, and national age-sex-specific mortality for 282 causes of death in 195 countries and territories, 1980–2017: a systematic analysis for the Global Burden of Disease Study 2017. The Lancet. 2018;392: 1736–1788. doi:10.1016/S0140-6736(18)32203-7
2. World Health Organization. Injuries and Violence. 19 Jun 2024 [cited 15 Mar 2026]. Available: https://www.who.int/news-room/fact-sheets/detail/injuries-and-violence
3. Adeloye D, Thompson JY, Akanbi MA, Azuh D, Samuel V, Omoregbe N, et al. The burden of road traffic crashes, injuries and deaths in Africa: a systematic review and meta-analysis. Bull World Health Organ. 2016;94: 510-521A. doi:10.2471/BLT.15.163121
4. Ferrari AJ, Santomauro DF, Aali A, Abate YH, Abbafati C, Abbastabar H, et al. Global incidence, prevalence, years lived with disability (YLDs), disability-adjusted life-years (DALYs), and healthy life expectancy (HALE) for 371 diseases and injuries in 204 countries and territories and 811 subnational locations, 1990–2021: a systematic analysis for the Global Burden of Disease Study 2021. The Lancet. 2024;403: 2133–2161. doi:10.1016/S0140-6736(24)00757-8
5. Ministry of Health. Emergency Care Systems in Uganda: A Comprehensive Facility-Based Assessment for Emergency, Critical and Operative Care. Apr 2024 [cited 15 Mar 2026]. Available: https://seedglobalhealth.org/wp-content/uploads/2025/04/Final-Report-ASSESSMENT-OF-EMS_April.pdf?utm
6. Zheng DJ, Sur PJ, Ariokot MG, Juillard C, Ajiko MM, Dicker RA. Epidemiology of injured patients in rural Uganda: A prospective trauma registry's first 1000 days. PLoS One. 2021;16: e0245779. doi:10.1371/journal.pone.0245779
7. Stone Luggya T, Alenyo Ngabirano A, Sarah R, Mabweijano J, Osire J, Achieng L, et al. Trauma unit admissions at the Ugandan National Referral Hospital: a descriptive study. Afr Health Sci. 2022;22: 404–9. doi:10.4314/ahs.v22i1.49
8. Lin N, Nwanna-Nzewunwa O, Carvalho M, Wange A, Ajiko MM, Juillard C, et al. Geospatial Analysis of Trauma Burden and Surgical Care Capacity in Teso Sub-region of Eastern Uganda. World J Surg. 2019;43: 2666–2673. doi:10.1007/s00268-019-05095-8

9. Balikuddembe JK, Ardalan A, Khorasani-Zavareh D, Nejati A, Kasiima S. Factors affecting the exposure, vulnerability and emergency medical service capacity for victims of road traffic incidents in Kampala Metropolitan Area: a Delphi study. BMC Emerg Med. 2016;17: 1. doi:10.1186/s12873-016-0112-3
10. Balikuddembe JK, Ardalan A, Khorasani-Zavareh D, Nejati A, Raza O. Weaknesses and capacities affecting the Prehospital emergency care for victims of road traffic incidents in the greater Kampala metropolitan area: a cross-sectional study. BMC Emerg Med. 2017;17: 29. doi:10.1186/s12873-017-0137-2
11. Magoola J, Kobusingye O, Bachani AM, Tumwesigye NM, Kimuli D, Paichadze N. Estimating road traffic injuries in Jinja district, Uganda, using the capture-recapture method. Int J Inj Contr Saf Promot. 2018;25: 341–346. doi:10.1080/17457300.2018.1431934
12. Kobusingye OC, Lett RR. Hospital-Based Trauma Registries in Uganda. The Journal of Trauma: Injury, Infection, and Critical Care. 2000;48: 498–502. doi:10.1097/00005373-200003000-00022
13. Hansda U, Mishra TS, Topno N, Sahoo S, Mohan S, Chakola S. Prehospital care and interfacility transfer of trauma patients before reaching the emergency of a level-1 trauma care center. J Family Med Prim Care. 2024;13: 656–659. doi:10.4103/jfmpc.jfmpc_1271_23
14. MacLeod JBA, Kobusingye O, Frost C, Lett R, Kirya F, Shulman C. A Comparison of the Kampala Trauma Score (KTS) with the Revised Trauma Score (RTS), Injury Severity Score (ISS) and the TRISS Method in a Ugandan Trauma Registry. European Journal of Trauma. 2003;29: 392–398. doi:10.1007/s00068-003-1277-5
15. Uganda Bureau of Statistics (UBOS). Uganda National Household Survey Report 2023/2024. 1 May 2025 [cited 27 Feb 2026]. Available: https://www.jointdatacenter.org/wp-content/uploads/2025/08/Uganda-National-Household-Survey-Report-20232024.pdf
16. El-Menyar A, El-Hennawy H, Al-Thani H, Asim M, Abdelrahman H, Zarour A, et al. Traumatic injury among females: does gender matter? J Trauma Manag Outcomes. 2014;8: 8. doi:10.1186/1752-2897-8-8
17. Injury epidemiology in Iran: a systematic review. J Inj Violence Res. 2017;9. doi:10.5249/jivr.v9i1.852
18. Laupland KB, Kortbeek JB, Findlay C, Hameed SM. A population-based assessment of major trauma in a large Canadian region. The American Journal of Surgery. 2005;189: 571–576. doi:10.1016/j.amjsurg.2005.01.036
19. Mitchell R, Curtis K, Fisher M. Understanding Trauma as a Men's Health Issue. Journal of Trauma Nursing. 2012;19: 80–88. doi:10.1097/JTN.0b013e3182562955
20. Women Rising Africa. Empowering women in Uganda with "women on wheels. 29 Jan 2024 [cited 15 Mar 2026]. Available: https://womenrisingforafrica.org/empowering-women-in-uganda-with-women-on-wheels/
21. Sahu RK, Sahu S, Jena H, Aisureya JB, Sahu S, Barik U, et al. Burn injury and gender inequity: epidemiological insights and social determinants. Int J Community Med Public Health. 2025;12: 5866–5870. doi:10.18203/2394-6040.ijcmph20254073

22. Karimi K, Faraklas I, Lewis G, Ha D, Walker B, Zhai Y, et al. Increased mortality in women: sex differences in burn outcomes. Burns Trauma. 2017;5. doi:10.1186/s41038-017-0083-y
23. Moore EC, Pilcher D, Bailey M, Cleland H. Women are more than twice as likely to die from burns as men in Australia and New Zealand: An unexpected finding of the Burns Evaluation And Mortality (BEAM) Study. J Crit Care. 2014;29: 594–598. doi:10.1016/j.jcrc.2014.03.021
24. Naddumba EK. A Cross-Sectional Retrospective Study of Boda Boda Injuries At Mulago Hospital in Kampala-Uganda. East Cent Afr J Surg. 2007 [cited 15 Mar 2026]. Available: https://www.ecajs.org/article/119895-a-cross-sectional-retrospective-study-of-boda-boda-injuries-at-mulago-hospital-in-kampala-uganda.pdf
25. Kitara DL. Boda Boda Injuries in Gulu Regional Hospital, Northern Uganda. East Cent Afr J Surg. 2011 [cited 15 Mar 2026]. Available: https://www.ecajs.org/article/119547-boda-boda-injuries-in-gulu-regional-hospital-northern-uganda
26. Vaca SD, Feng AY, Ku S, Jin MC, Kakusa BW, Ho AL, et al. Boda Bodas and Road Traffic Injuries in Uganda: An Overview of Traffic Safety Trends from 2009 to 2017. Int J Environ Res Public Health. 2020;17. doi:10.3390/ijerph17062110
27. Rodney M. In Uganda's chaotic capital, boda-boda motorcycle taxis are a source of life and death. 20 Aug 2024 [cited 15 Mar 2026]. Available: https://www.ap.org/news-highlights/spotlights/2024/in-ugandas-chaotic-capital-boda-boda-motorcycle-taxis-are-a-source-of-life-and-death/
28. Galukande M, Jombwe J, Fualal J, Gakwaya A. Boda-boda injuries, a health problem and a burden of disease in Uganda: A tertiary hospital survey. East Cent Afr J Surg. 2009;14: 33. Available: http://www.bioline.org.br/
29. Bhattarai HK, Bhusal S, Barone-Adesi F, Hubloue I. Prehospital Emergency Care in Low- and Middle-Income Countries: A Systematic Review. Prehosp Disaster Med. 2023;38: 495–512. doi:10.1017/S1049023X23006088
30. Messelu MA, Ayenew T, Alamneh TS, Demile TA, Shibabaw AT, Belayneh AG. Prolonged time to recovery and its predictors among trauma patients admitted to the intensive care units in comprehensive specialized hospitals in Northwest Ethiopia: a multicenter retrospective follow-up study, 2022. Front Med (Lausanne). 2024;11. doi:10.3389/fmed.2024.1366403
31. Ramakrishnan VT, Cattamanchi S. Transfusion practices in trauma. Indian J Anaesth. 2014;58: 609–615. doi:10.4103/0019-5049.144668
32. Zia N, Mehmood A, Namaganda RH, Ssenyonjo H, Kobusingye O, Hyder AA. Causes and outcomes of traumatic brain injuries in Uganda: analysis from a pilot hospital registry. Trauma Surg Acute Care Open. 2019;4: e000259. doi:10.1136/tsaco-2018-000259
33. Liu BC, Ivers R, Norton R, Boufous S, Blows S, Lo SK. Helmets for preventing injury in motorcycle riders. Cochrane Database of Systematic Reviews. 2008. doi:10.1002/14651858.CD004333.pub3
34. Roehler DR, Naumann RB, Mutatina B, Nakitto M, Mwanje B, Brondum L, et al. Using baseline and formative evaluation data to inform the Uganda Helmet Vaccine Initiative. Glob Health Promot. 2013;20: 37–44. doi:10.1177/1757975913509657

Figures

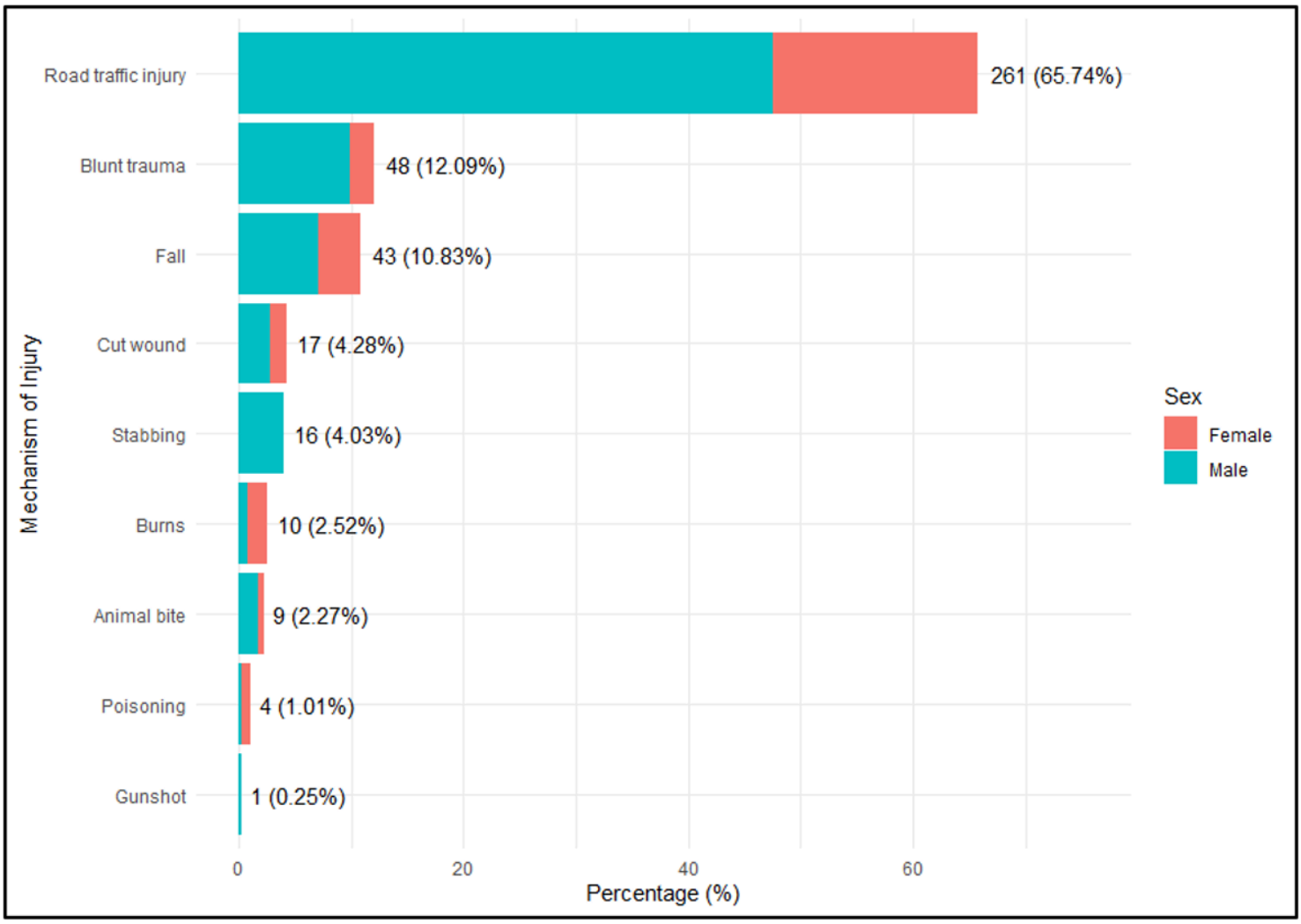


Figure 1

Mechanism of injury by sex of the trauma patients

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