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Assessment of Road Traffic Deaths and Serious Injuries in Major Referral Hospitals and Mortuaries in Kampala

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Retrospective Assessment of Road Traffic Deaths and Serious Injuries in Major Referral Hospitals and Mortuaries in Kampala, 2020-2021

Collaborating institutions

Mulago National Referral Hospital
Republic of Uganda

KCCA
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CITY MORTUARY, MULAGO

China-Uganda Friendship Hospital -Naguru
Republic of Uganda

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Table of contents

Acknowledgements

This report presents findings of a retrospective study on road traffic deaths and serious injuries conducted in major referral hospitals and mortuaries in Kampala. The study involved linkage of police and hospital data to get a reliable estimate of road traffic-related mortality.

The report was developed under the Kampala Capital City Authority (KCCA)-Bloomberg Philanthropies Initiative for Global Road Safety (BIGRS) partnership. Since 2020, KCCA has received technical support from BIGRS to implement evidence-based interventions to reduce injuries and deaths due to road crashes.

Hospital case records on road traffic deaths and serious injuries was supported by the Accident and Emergency department, Mulago National Referral Hospital; Kampala Capital City Authority (KCCA) mortuary; and the Accident and Emergency, and Mortuary departments, China-Uganda Friendship Hospital-Naguru. Data abstraction at the participating hospitals and mortuaries was completed by nurses and records department staff.

Police crash data for Kampala was accessed from the Directorate of Traffic and Road Safety, Uganda Police Force. Data abstraction at the police stations in the city was completed by trained field assistants.

Stellah Namatovu, the BIGRS Surveillance Coordinator in Kampala, coordinated data abstraction, analysis, and draft of the report. Dr Raphael Awuah and Dr Sara Whitehead – both from Vital Strategies – supervised data abstraction, analysis, and review and revision of the report. Dr Gideon Kurigamba, Emergency Physician Specialist at Mulago National Referral Hospital; Dr Nanteza Sumaya, Emergency Physician Specialist at China-Uganda Friendship Hospital-Naguru; and Dr Moses Byaruhanga, head of the KCCA mortuary, provided on-site supervision during data abstraction. Maria Nkalubo – Ministry of Health, BIGRS Initiative Coordinator, Jemima Nalumansi, and BIGRS Technical Lead, Eng. Jacob Byamukama also contributed to the report's development.

Thanks to the management of KCCA for the commitment to use a data-driven approach to save lives from road crashes in the city.

Executive summary

Road traffic crashes are among the leading causes of death in Uganda like in many low- and middle-income countries. The burden of road fatalities is often higher in cities such as Kampala. Reliable data are needed to implement effective policies and interventions to save lives from road crashes.

Data on road traffic deaths and injuries are often sourced from police records. However, there are limitations in relying solely on police data. Underreporting, particularly for vulnerable road users such as pedestrians, motorcyclists, and bicyclists, is common. To get a reliable count of road traffic deaths, the World Health Organization recommends complementing police data with other data sources – including data from the health sector.

Without a robust national vital registration system in Uganda, case records in hospitals and mortuaries are among few available sources to complement police crash records to generate better estimates of road traffic deaths. Road injury data from health facilities also help to describe the types and severity of injuries.

Retrospective road fatality and serious injury data were collected from major referral hospitals and mortuaries in Kampala. The goal was to link hospital and police data on road fatalities to provide a basis for re-estimating deaths. The study also sought to describe the profile of those killed and injured from road crashes in the city.

Data were accessed and abstracted from the Accident and Emergency department, Mulago National Referral Hospital; Kampala Capital City Authority mortuary; and the Accident and Emergency and Mortuary departments, China-Uganda Friendship Hospital-Naguru.

Records of patients who were admitted (for at least 24 hours) from injuries due to road crashes, and those who died prior to or while on admission from January 1, 2020 to December 31, 2021 were identified. Police crash data for the same period was also accessed. Hospital fatal cases which were documented to have occurred in Kampala were manually linked to police fatal crash records.

The findings show that there were 2,517 deaths from hospital records in the two-year study period. Of these, 662 (26%) were from crashes which were documented to have occurred in Kampala. Police recorded 655 road traffic deaths in Kampala for the same period.

Of the 662 deaths from hospital records, 146 were linked to police records, yielding a 22% match rate. Based on the linkage, the conservative estimate of the number of fatalities from crashes in Kampala for the two-year study period is 1,171. The estimated mortality count suggests that deaths were 1.8 times higher than police-reported deaths.

Of the fatal cases, more than half (64%) were head injuries. Among vulnerable road users – pedestrians, bicyclists, and motorcyclists – head injuries and injuries to the lower leg were common.

The study highlights the need to complement police data with other data sources to get a more accurate count of road traffic deaths. In addition, the findings can inform emergency response and post-crash care delivery.

Background

Road traffic deaths and injuries remain a public health concern globally. Estimates show that about two-thirds of fatalities impact individuals in the working-age bracket of 18 to 59 years, resulting in substantial health, social, and economic consequences for countries (World Health Organization [WHO], 2023).

Over 90% of road deaths occur in low- and middle-income countries. Notably, fatality rates are pronounced in low-income nations with 21 deaths per 100,000 population, whereas high-income countries have comparatively lower rates at 8 deaths per 100,000 population (WHO, 2023).

In Uganda, there has been a consistent increase in reported fatal and serious crashes since 2020. Reported fatal crashes (that is, a crash with at least one fatal victim) increased by 7% in 2023 – from 3,901 in 2022 to 4,179. Similarly, serious crashes increased by 16% in 2023 – from 10,776 in 2022 to 12,487 (Directorate of Traffic and Road Safety, Uganda Police Force, 2024).

In Kampala, the number of reported fatal victims has increased steadily since 2020. In 2020, reported road traffic deaths in the city was 236, it increased to 419 in 2021, and marginally increased to 425 in 2022. Consequently, the death rate increased from 7.2 deaths per 100,000 population in 2020 to 12.1 per 100,000 in 2021 and dropped to 11.6 per 100,000 in 2022 (Kampala Capital City Authority, 2023).

The burden of deaths and injuries at the national and city levels presents a significant health, social and economic concern, especially as a majority of those who die are young people in their most productive years (WHO, 2023). Without effective preventive measures, the number of deaths and injuries is likely to increase.

To achieve the United Nation's target of a 50% reduction in road traffic deaths and injuries by 2030 as part of the second Decade of Action for Road Safety (2021-2030),

it is important to use a data driven approach to understand the burden to develop or update road safety action plans and implement effective actions to save lives. A data-driven approach will also help to assess and measure the impact of implemented road safety activities.

While police crash records serve as the primary source for many national and city data systems on road traffic deaths and injuries, it is essential to acknowledge their limitations (Adeloye, 2016). Underreporting is common particularly for vulnerable road users (Constant, 2010). In addition, given that police are not medically trained, classification of injury severity and types is not feasible for them to undertake (WHO, 2010).

For a more precise assessment of road injuries and fatalities, the World Health Organization (WHO) and the Africa Regional Road Safety Observatory recommend utilizing a minimum of two official independent data sources, with at least one from the health sector (WHO, 2010). In the absence of a robust national vital registration system in Uganda, hospital and mortuary case records are among the few reliable sources.

Data from health facilities are important for re-estimating road traffic fatalities and injuries and providing a good description of injury types and severity (Chang, 2020). This information can guide planning for hospital staffing, health professional training, and resource allocation for healthcare services and rehabilitation for victims of road traffic crashes.

A study to assess retrospective data on road traffic fatalities and serious injuries from two major tertiary care hospitals and mortuaries in Kampala was conducted in 2023. The study sought to link hospital and mortuary fatal case records to police fatal crash records to generate a reliable count of road deaths in Kampala. In addition, the study sought to describe the profile of those killed or injured from road traffic crashes.

Materials and Methods

Study design

The study used a descriptive cross-sectional design approach to abstract retrospective routine hospital data. All cases of road injury which required hospital admission and those who died on admission or directly at the scene of the crash were identified from existing records. Fatal case records were linked to police fatal crash cases to generate a reliable estimate of road traffic fatalities in Kampala.

Study sites

The study was conducted at the Accident and Emergency (A & E) department, Mulago National Referral Hospital; Kampala Capital City Authority mortuary; and the Accident and Emergency and Mortuary departments, China-Uganda Friendship Hospital-Naguru. A feasibility assessment was conducted in major referral health facilities in Kampala prior to the commencement of the study. Findings from the assessment showed that a significant majority of seriously injured road crash victims and those who die prior to admission are sent to the selected hospitals and mortuaries.

Study procedures

The study accessed records of road crash victims who were admitted or who died before admission from January 1, 2020 to December 31, 2021. In each participating facility, staff performed case identification and data abstraction on site. Initial identification of eligible cases was done using emergency department and mortuary registers that identified road crash injury as the reason for attendance. Post-mortem records were requested where applicable.

Staff of the participating facilities who supported data collection used a standardized abstraction form with variables including demographics, road user characteristics, injury diagnoses, and disposition. Personal identifying variables (such as name and age) and crash location details were collected to facilitate linkage to police fatal crash records for the same period.

Exclusion criteria

Records of road crash victims who were not admitted (that is, cases with minor injuries) were excluded from this study. Records of individuals reporting for post-crash care support after the first hospital visit were also excluded.

Police crash data

Previously collected police crash data for the same period (January 1, 2020 to December 31, 2021) were used to link hospital fatal records documented to have occurred in Kampala.

Data management and handling

Upon completion of data abstraction, original records remained at the respective hospitals and mortuaries. Copies of the completed data forms were safely stored with KCCA-BIGRS Surveillance Coordinator, one of the study co-investigators.

Only trained personnel directly involved with the study, with signed confidentiality agreements, entered the data. Electronic records were stored on a password-protected encrypted disk drive accessible only to the study investigators. Personal identifiers were removed after linkage and analyses were completed.

Data analysis

Hospital fatal case records were manually linked with police fatal crash records. Linkage variables included name (allowing for spelling variation), date of crash/date of presentation to hospital, age, sex, and road user type. Hospital deaths from crashes which occurred outside Kampala and ones where the location was not documented were excluded from the linkage process.

A conservative approach was used to estimate the number of road traffic fatalities within the city of Kampala given the inconsistent documentation of key variables, such as location of the crash, in hospital records. The conservative estimate was determined by adding the number of deaths in police and hospital records, minus the number of linked cases.

An interpolated or central estimate was also generated by applying a proportion of hospital fatal cases in known locations (that is, those which occurred in Kampala and those outside the city) to hospital fatal cases where the location of the crash was not documented (unknown locations), and the number of linked cases. The proportion of deaths in known locations (within and outside Kampala) was derived by dividing the number of hospital fatal cases which occurred in Kampala by the sum of fatal cases which occurred both within and outside the city, multiplied by 100.

In addition, we applied the capture-recapture approach to generate overall stratified estimates of road deaths in the city. Capture-recapture is a method of estimating a total population based on cases captured in more than one discrete sample or data sources (Morrison, 2000). The technique has been applied to a wide range of epidemiologic studies, including road traffic mortality and morbidity (Abegaz 2014, Magoola, 2018). However, the underlying assumptions for this statistical method were not necessarily met to be applied to the overall estimate of deaths in the present study. The capture-recapture approach in this study adapted the Chapman estimator (Chapman, 1951) given by the following equation:

$$\tilde{N} = \frac{(S1+1) * (S2+1)}{(n+1)} - 1$$

Where Ñ is the estimated number of fatal cases, S1 is the number of events recorded in the first data source (police records), S2 is the number of events recorded in the second data source (hospital records), and n is the number of events reported in both data sources (matched cases). The standard errors (SE) and 95% confidence intervals (95%CI) of the estimates were computed using the following formulas:

$$SE(\tilde{N}) = \sqrt{\frac{(\tilde{N}-S1)\ (\tilde{N}-S2)}{n}} \quad \text{and} \quad 95\%\ CI = \tilde{N} \pm 1.96SE$$

Stratified capture-recapture analysis was conducted by sex (male or female), age (0–19, 20–39, 40–59, or ≥ 60) and road user type (pedestrian, motorcyclist, vehicle occupant, or other/unknown). In addition, descriptive analysis was conducted to assess the characteristics of those who were killed or seriously injured.

Ethics approval

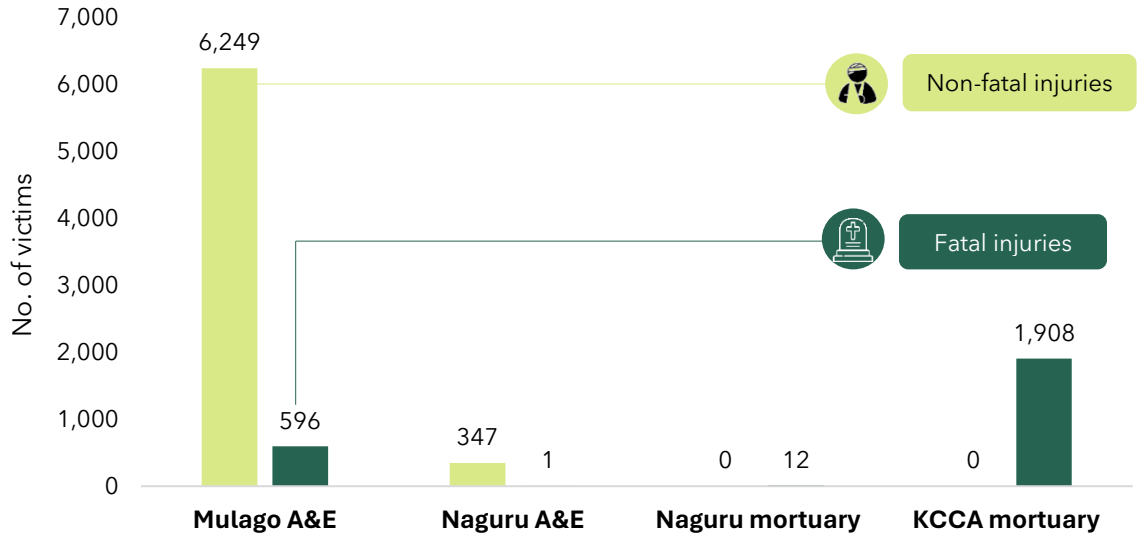
Approval for the study was provided by Mulago Hospital Research Ethics Committee, China-Uganda Friendship Hospital Naguru Research Ethics Committee, Uganda National Council for Science and Technology and BRANY SBER Institutional Review Board on behalf of Vital Strategies who provided technical assistance for the study.

Results

Hospital fatal and non-fatal injuries

In total, there were 9,113 casualties of road crashes from 2020 to 2021 captured in the records of the facilities selected for the study. Of the cases admitted to the two A & E departments selected for the study, 6,596 (92%) were discharged while 597 (8%) died. In addition, there were 1,920 cases who died prior to admission and captured in the records of the two mortuaries (Figure 1).

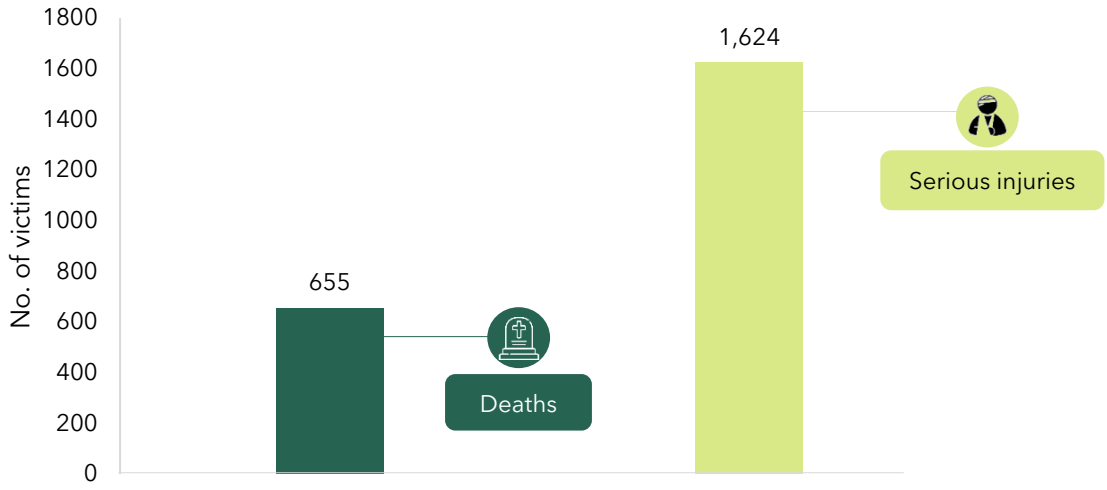
Figure 1. Fatal and non-fatal injuries in the selected hospitals and mortuaries, 2020-2021



Police reported deaths and serious injuries in Kampala

Police reported 655 road traffic deaths and 1,624 serious injuries in Kampala from 2020 to 2021 (Figure 2). It is worth noting that in 2020, the number of police reported fatalities in the city decreased by 25% compared to the previous year (from 315 reported deaths in 2019 to 236); but increased sharply by 78% in 2021 over the previous year (from 236 in 2020 to 419). The decline in 2020 could partially be attributed to mobility restrictions due to the COVID-19 pandemic.

Figure 2. Police recorded deaths and serious injuries in Kampala, 2020-2021

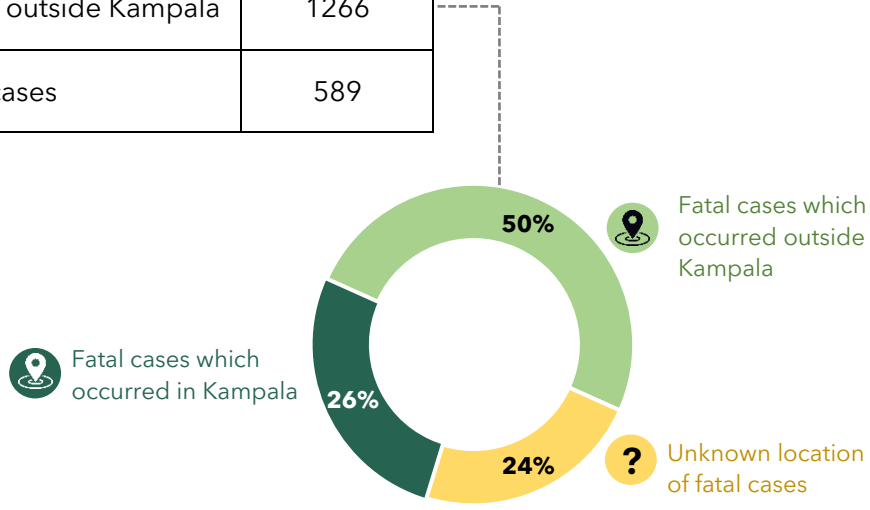


Fatal crash locations

There were 2,517 deaths from road crashes in A & E (n=597) and mortuary (n=1920) records (Figure 1). Of these, the location of 662 cases (26%) were documented to have occurred in Kampala, 1,266 (50%) outside the city's boundary, and 589 (24%) in undocumented locations (labelled as 'unknown location') (Table 1).

Tabel 1. Distribution of hospital fatal records by crash location, 2020-2021

Place of crash	Number
Fatal cases which occurred in Kampala	662
Fatal cases which occurred outside Kampala	1266
Unknown location of fatal cases	589



Estimates of road fatalities in Kampala

Conservative estimate

Of the 662 deaths in hospital records from crashes which occurred in Kampala, 146 were linked to police records, yielding a 22% match rate. Based on a conservative approach, the estimated number of road traffic deaths in Kampala for the two-year study period was 1,171 (Table 2).

Table 2. Conservative estimate of road traffic deaths in Kampala, 2020-2021

Conservative estimate				
Police-reported deaths in Kampala	Hospital-reported deaths in Kampala	Linked cases	Estimated number of deaths	Police records as a % of estimate
655	662	146	1,171	56%

Interpolated estimate

When crashes with unknown locations were allocated in the same proportion as those with known locations (i.e., in and outside Kampala), the estimated number of deaths in the city was 1,321 (Table 3).

Table 3. Interpolated estimate of road traffic deaths in Kampala, 2020-2021

Interpolated estimate				
Police-reported deaths in Kampala	Hospital-reported deaths in Kampala*	Linked cases*	Estimated number of deaths	Police records as a % of estimate
655	862	196	1,321	50%

*The number of hospital fatal cases in Kampala was divided by the sum of hospital fatal cases which occurred in and outside Kampala (i.e. 662/662+1,266*100=34%) and applied as a proportion to hospital fatal cases in unknown locations (i.e. 34% of 589) and linked cases (34% of 146) to derive 862 hospital-reported deaths and 196 linked cases.

Capture-recapture estimate

A capture-recapture approach was used to generate overall and stratified estimates of road fatalities. Applying the capture-recapture technique yielded a maximum estimate of 2,959 road traffic deaths in Kampala in the study period. Tables 4 and 5 show the maximum estimate of road fatalities and the stratified capture-recapture estimates. Notably, hospital cases reflected a higher proportion of pedestrian deaths compared to motorcyclists, in contrast to police-reported cases.

Table 4. Maximum estimate of road traffic deaths in Kampala, 2020-2021

Maximum estimate				
Police-reported deaths	Hospital-reported deaths in Kampala	Linked cases	Estimated number of deaths	Police records as a % of estimate
655	662	146	2,959	22%

Table 5. Stratified capture-recapture estimates of road traffic deaths in Kampala, 2020-2021

Characteristic	Police-reported deaths in Kampala n (%)	Hospital-reported deaths in Kampala n (%)	Linked cases n (%)	Estimated deaths (95% Confidence Interval)
Sex				
Male	525 (80)	581 (88)	127 (87)	2,392 (2,073 – 2,711)
Female	99 (15)	81 (12)	19 (13)	410 (267 – 553)
Age group				
0-19	54 (8)	29 (4)	5 (3)	275 (71 – 479)
20-39	211 (32)	208 (31)	46 (32)	943 (731 – 1,155)
40-59	57 (9)	65 (10)	15 (10)	239 (149 – 329)
60+	17 (3)	10 (2)	3 (2)	49 (10 – 88)
Missing	316 (48)	350 (53)	77 (53)	1,427 (1,182 – 1,672)
Road user type				
Motorcyclist	321 (49)	166 (25)	34 (25)	1,415 (1,039 – 1,791)
Pedestrian	265 (40)	356 (54)	81 (56)	1,158 (974 – 1,342)
Vehicle occupant	37 (6)	6 (1)	4 (3)	53 (26 – 80)
Other/Unknown	32 (5)	134 (20)	24 (16)	178 (147 – 209)

Injury types in hospital records

Injury types documented in A & E and mortuary records (irrespective of the location of the crash) were classified by using Chapter 19 codes of the International Classification of Diseases 10 (ICD 10) manual. These codes classify injuries by body region.

Head injuries constituted the highest proportion (65%) of fatal injuries for the two-year study period. Similarly, about a third (35%) of non-fatal cases were head injuries followed by injuries to multiple body regions (23%) (Table 6).

Table 6. Percent distribution of injury types, 2020-2021

ICD code	Description	All injuries	Non-fatal injuries	Fatal injuries
S00 – S09	Head	43%	35%	65%
S10 – S19	Neck	1%	1%	0%
S20 – S29	Thorax	1%	2%	1%
S30 – S39	Abdomen, lower back and pelvis	3%	3%	2%
S40 – S49	Shoulder and upper arm	2%	2%	0%
S50 – S59	Forearm	1%	1%	0%
S60 – S69	Wrist and hand	0%	0%	0%
S70 – S79	Hip and thigh	8%	11%	1%
S80 – S89	Lower leg	11%	15%	1%
S90 – S99	Ankle and foot	3%	4%	0%
T00 – T07	Multiple body regions	19%	23%	8%
T08 – T14	Injuries to unspecified part of trunk, limb of body region	8%	3%	22%
Total		**100%**	**100%**	**100%**

The distribution of all injury types (non-fatal and fatal) by road user type is presented in Table 2. Head injuries were common among vulnerable road users – pedestrians (43%), motorcyclists (42%) and bicyclists (49%). Similarly, about a third (32%) of vehicle occupants had head injuries (Table 7).

Table 7. Percent distribution of all injuries (non-fatal and fatal) by road user type, 2020-2021

Injury type	Pedestrians	Motorcyclists	Bicyclists	Vehicle occupants	Unknown
Head	43%	42%	49%	32%	50%
Neck	0%	0%	0%	2%	0%
Thorax	1%	1%	2%	3%	3%
Abdomen, lower back and pelvis	3%	3%	3%	7%	3%
Shoulder and upper arm	1%	2%	3%	4%	2%
Forearm	1%	1%	3%	2%	1%
Wrist and hand	0%	0%	0%	1%	1%
Hip and thigh	8%	9%	7%	8%	6%
Lower leg	12%	11%	8%	9%	9%
Ankle and foot	3%	3%	4%	2%	3%
Multiple body regions	18%	21%	16%	23%	15%
Injuries to unspecified part of trunk, limb of body region	10%	7%	4%	8%	8%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Hospital-recorded deaths and injuries by sex and age

Of the total number of cases captured in A & E and mortuary records, 88% of fatal and 81% of non-fatal injuries were among males (Figure 3). Additionally, those aged 20 to 49 years accounted for 44% of fatal and 71% of non-fatal injuries (Figure 4). It is worth highlighting that 41% and 4% of fatal and non-fatal records respectively did not have the age of the victim documented.

Figure 3. Hospital road traffic deaths and injuries by sex, 2020–2021

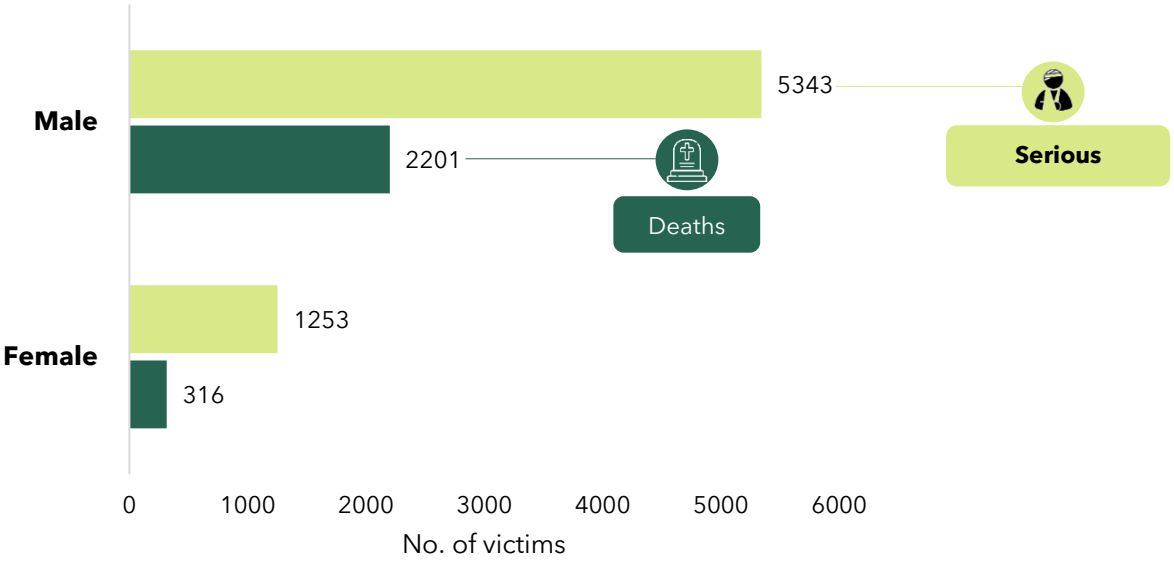
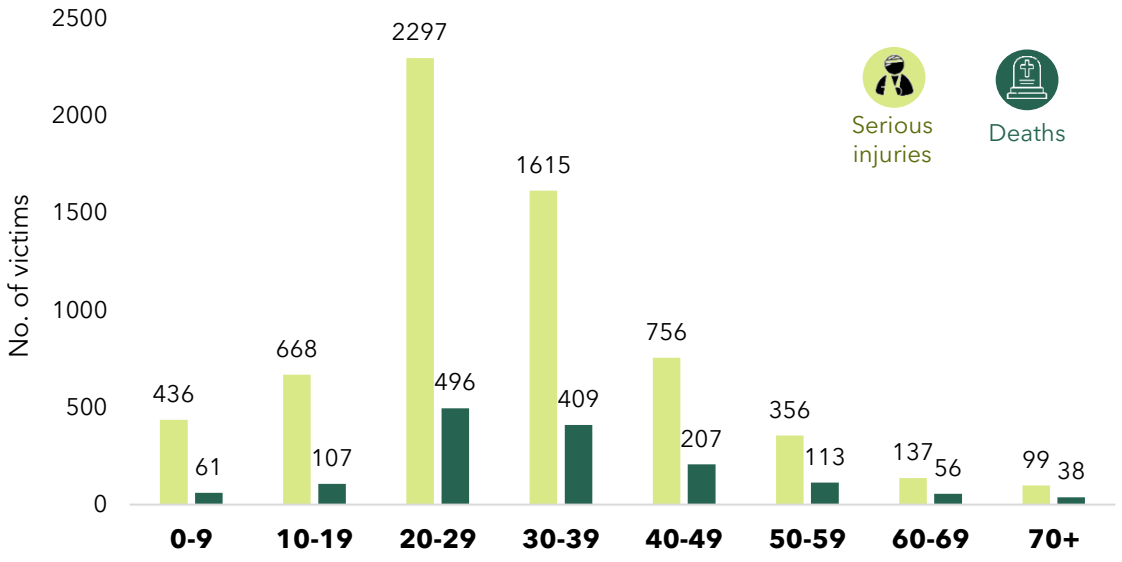


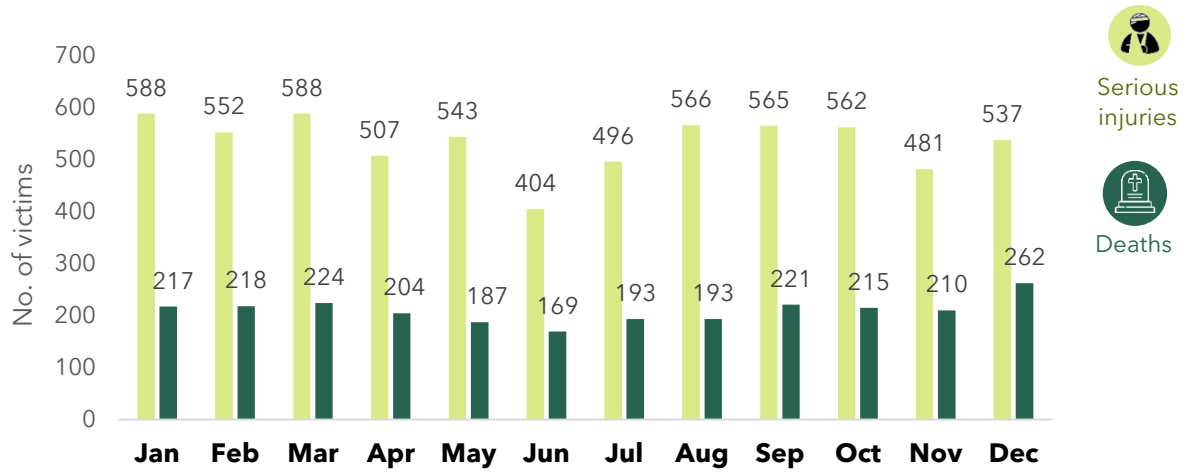
Figure 4. Deaths and injuries by age, 2020–2021



Hospital-recorded deaths and injuries by month

The number of deaths and injuries in A & E and mortuary records fluctuated by month with no observed seasonal pattern (Figure 5). However, the highest number of deaths were recorded in December (similar to what was observed in police records).

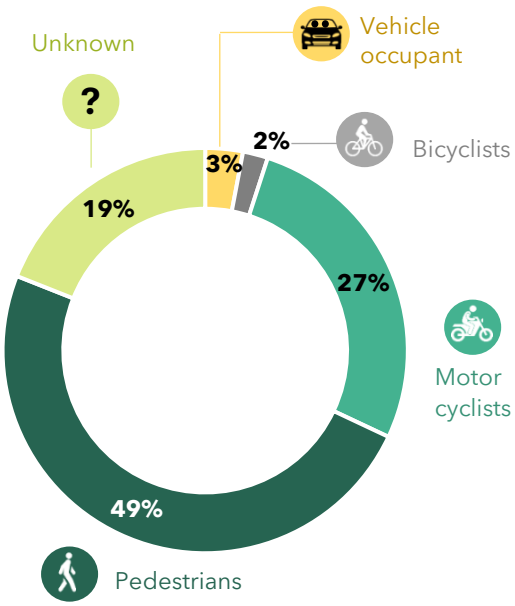
Figure 5. Deaths and injuries by month, 2020-2021



Hospital-recorded deaths by road user type

Hospital-reported deaths by road user type showed a slightly different pattern to police records. In hospital records, pedestrians accounted for the highest proportion of deaths (Figure 6) while in police records, motorcyclists accounted for the highest (a similar patten was observed for injuries). Notwithstanding, deaths among vulnerable road users (pedestrians, motorcyclists, and cyclists) were significantly higher (compared to vehicle occupants) in both hospital and police records. This highlights the need to prioritize the safety of vulnerable road users.

Figure 6. Hospital deaths by road user type



Mode of arrival

Figures 7 to 8 show the mode of arrival at Mulago National Referral Hospital and Naguru Hospital respectively for severely injured road crash victims. The mode of arrival of most of the victims at Mulago National Referral Hospital (53%) and China-Uganda Friendship Hospital-Naguru (97%) was not documented. However, about a third (36%) of victims sent to the A & E department at Mulago National Referral Hospital were brought in by an ambulance. It is important to highlight that it was not possible to determine from hospital records whether the ambulances were emergency response vehicles or hospital owned. These ambulances are therefore likely to be transfers from other hospitals rather than ones from the crash site especially as the two selected hospitals for the study are major referral centers.

Figure 7. Mode of arrival – Mulago National Referral Hospital

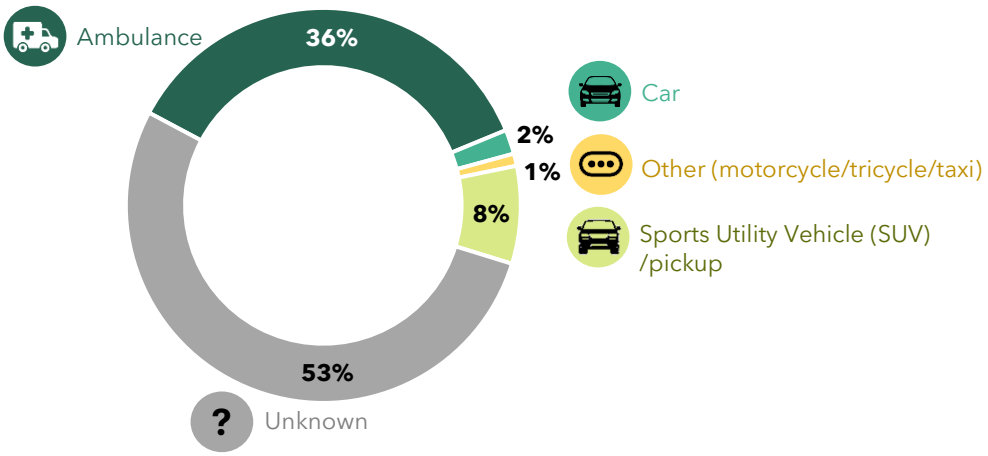
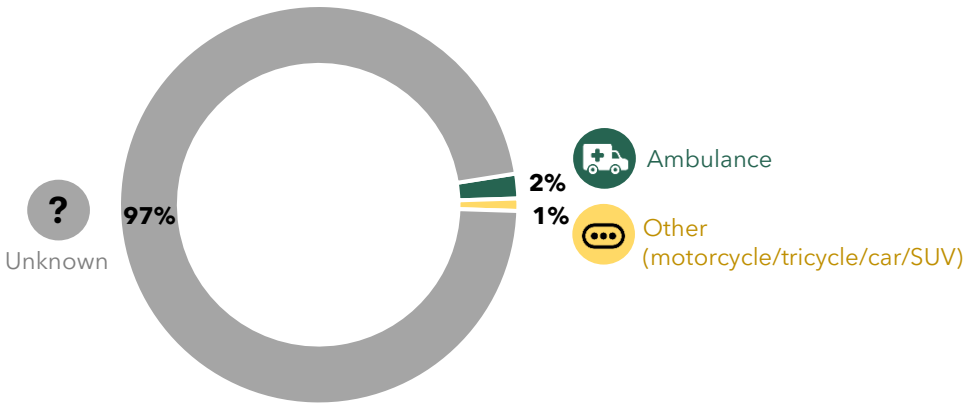


Figure 8. Mode of arrival – China-Uganda Friendship Hospital-Naguru



Discussion

Findings of this record linkage study suggest an inconsistent reporting of road traffic deaths in Kampala. Using the conservative approach, fatalities in Kampala are estimated to be at least 1.8 times higher than police-reported deaths. This finding is consistent with a previous nationwide study in Uganda, which suggested there were 2.1 times more road traffic deaths than official police reports (Muni, 2021). In addition, the WHO Global Status Report on Road Safety estimates 1.8 times more deaths in Uganda than officially reported (WHO, 2023).

The study's findings show evidence of inconsistent reporting of road traffic deaths in Kampala when relying on police records alone. This may be due (but not limited) to the lack of systematic follow-up by police to determine potentially fatal outcomes of victims admitted in hospitals, the fact that some road crashes are not reported to the police – which means there is no record of the crash, inability of police to attend all crashes due to human and other resource limitations, and poor quality documentation of crashes mainly as a result of the non-use of a standardized tool.

The distribution of deaths by sex and age in hospital and police records were the same with males and young adults aged 20 to 39 years accounting for the highest number of deaths. Other studies have found that males are three times more likely to die from road traffic cashes compared to females (Babalola et al., 2015; Mohammadi, 2013). In addition, a similar age distribution has been observed in road deaths and hospitalizations in some low- and middle-income countries (Alam & Mahal, 2016).

However, it important to highlight that hospital records showed a higher proportion of pedestrian deaths while police records showed a higher proportion of motorcyclist deaths. These findings are consistent with findings from similar studies in African cities (Lagarde, 2007 and Mabunda, 2008). Often in urban areas, high pedestrian volumes, increased use of motorcycles, and inadequate safe road

infrastructure significantly increase the risk of death and injuries to pedestrians and motorcyclists, and in many studies these pedestrian deaths are not consistently reported by police (Dandona et al., 2008; 16. Samuel et al., 2021; Watson et al., 2015). The finding highlights the need to prioritize the safety of vulnerable road users in Kampala, including more complete documentation of their risk of road trauma.

Overall, the findings in this study reinforce the need of linking data from different sources to generate more precise estimates of road traffic deaths. This can better inform actions and interventions in healthcare, transport, and law enforcement to save lives.

Additionally, these findings emphasize the importance of high-quality data originating from both police and healthcare facilities. Achieving this can be facilitated by building capacity on improving data quality and completeness for both sectors.

Limitations

This study covered a limited geographical area, so caution should be taken when extrapolating these findings to other cities in Uganda. Documentation in hospital case records was limited, as shown by the high proportion of missing age, road user, and crash location information. This missing information may have reduced the quality of record linkage and thus resulted in an inflated estimate using the capture-recapture method. Given this and the fact that the two selected hospitals account for almost all severe trauma referrals in the city, we chose the more conservative approach of a combined total police and hospital records to estimate total deaths. The capture-recapture estimate is considered an upper limit estimation.

Recommendations

The inconsistent reporting of road traffic fatalities in police records highlights the significance of leveraging additional data sources to enhance the accuracy of death estimates. This approach is essential for achieving improved outcomes.

In addition, the high proportion of fatalities among pedestrians and motorcyclists in both data sources highlight the need to prioritize actions to improve their safety in Kampala and potentially other cities in Uganda.

The following recommendations aim to improve data collection systems and data linkage processes and ensure that quality data is used to drive road safety interventions.

- Efforts should be made to enhance data collection systems in major referral hospitals in Kampala. This improvement is essential to enable the consistent and standardized documentation of data which can inform planning, and effective decision-making.
- Both police and hospital staff should consider the inclusion of a unique identifier, such as the national identification number, whenever it is available for victims or patients. This practice could enhance data linkage and integration.
- Periodic linkage of hospital and police data is essential for evaluating the extent of inconsistent reporting in official crash records and obtaining a more accurate estimate of the number of individuals killed in road crashes. This is particularly crucial due to the social and economic consequences of road crashes at the individual, household, and institutional level.
- Efforts to enhance road safety through road infrastructure improvements, enforcement, education, and other essential interventions should prioritize those most vulnerable to fatalities or injuries in road crashes. Achieving this requires a comprehensive approach that draws on data from multiple sources.

Conclusions

Linkage of hospital and police records on fatal road crash victims in Kampala for 2020 and 2021 suggests that deaths are inconsistently reported. The inconsistent reporting confirms the rationale for using complementary data to enhance official records on crash outcomes. Police and hospital data integration should be introduced to enhance the reliability of crash data (WHO & EuroMed Transport Support Project, 2019). Key variables like road name and crash location should be consistently documented in hospital records to improve data linkage and analysis. Additionally, the quality of the data captured and means of archiving in both databases need to be improved to ease the process of data extraction and analysis (Kamaluddin, 2019).

Improving the existing nationwide civil registration and vital statistics (CRVS) system could in turn improve the quality of cause of death documentation which could be used a complementary data source for assessing the burden of road traffic deaths.

Also, promoting the use of a standardized data collection tool that systematically captures key information about crash victims and incorporating it in the Health Information Management System (HIMS) by the Ministry of Health (MoH) will improve data quality and completeness and facilitate data linkage.

In addition, the introduction of a national road crash data management system is expected to create a digital platform for the collection and management of police crash data, which could also facilitate linkage purposes.

While there are ongoing efforts to establish a strong national crash reporting system and improve hospital management information systems, periodic record linkage exercises, such as the one described in this report, can help to better assess the burden of road traffic deaths and injuries.

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Notes

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