Prevalence of non-fatal injuries and associated factors in Mbarara Municipality, Western Uganda, December 2016-June 2017

Rebecca Nuwematsiko[1,&], Angela Nakanwagi Kisakye[1,2], David Musoke[1], Delia Bandoh[3], Lillian Bulage[4], Olufemi Olamide Ajumobi[5,6], Frederick Oporia[1], Fiston Muneza[1], Nino Paichadze[7], George Pariyo[8], Abdulgafoor Bachani[8], Olive Kobusingye[1], Kenneth Mugwanya[1], John Ssempebwa[1]

[1]Makerere University School of Public Health, College of Health Sciences, Kampala, Uganda, [2]African Field Epidemiology Network, Kampala Uganda, [3]Ghana Field Epidemiology and Laboratory Training program, Accra, Ghana, [4]Public Health Fellowship Program/African Field Epidemiology Network, Kampala, Uganda, [5]Nigeria Field Epidemiology and Laboratory Training Program, Abuja, Nigeria, [6]African Field Epidemiology Network Nigeria Country Office, Abuja, Nigeria, [7]Milken Institute School of Public Health, George Washington University, Washington, DC, USA, [8]Johns Hopkins International Injury Research Unit, Department of International Health, Johns Hopkins University Bloomberg School of Public Health, Baltimore MD, USA

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[&]CORRESPONDING AUTHOR
Rebecca Nuwematsiko, Makerere University School of Public Health, College of Health Sciences, New Mulago Hill Hospital Complex, P.O Box 7072, Kampala, Uganda, Email: beckyrich123@gmail.com

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ABSTRACT

Background: Injuries are a significant public health problem but poorly quantified especially in low and middle-income countries. In Uganda, the burden of injuries is poorly quantified with most of the data reported being facility and mortality based. Many non-fatal injuries, therefore, remain unreported in communities. We conducted a household survey in Mbarara Municipality to identify and describe all non-fatal injury events and the associated factors. **Methods:** We conducted a cross-sectional study of non-fatal injuries among 966 household members in Mbarara Municipality, from May to June 2017. The most recent non-fatal injury (within a six-month recall period; December 2016 to June 2017) resulting in loss of at least one day of usual daily operating activity was considered. We conducted a descriptive statistical analysis to estimate the counts and frequencies of non-fatal injuries. We identified factors associated with non-fatal injuries using a modified Poisson regression model. **Results:** The prevalence of non-fatal injuries was 18.2% (176/966) with 92% (162/176) of the non-fatal injuries being unintentional. Falls 27.3% (48/176) were the most common cause of injury followed by road traffic injuries (RTI), 26.7% (47/176), burns 16.5% (29/176) and the least being poisoning 2.8% (5/176). Occupation as casual laborer (Adjusted PR=2.1, 95% CI: 1.2 - 3.7), urban residency (Adjusted PR=1.5, 95% CI: 1.1 - 1.9) and being a non-native of the study area (Adjusted PR=1.7, 95% CI: 1.3 - 2.3) were independently associated with non-fatal injuries. **Conclusion:** Almost one out of five people had suffered a non-fatal injury in the past six months in Mbarara Municipality. Majority of the non-fatal injuries were unintentional, caused by falls and RTIs, and were amongst casual labourers and urban residents. These findings reveal a gap in injury prevention in Uganda that needs to be addressed to improve the quality of life.

Introduction

Injuries and the resulting disabilities are a significant but poorly quantified public health problem, especially in low- and middle-income countries [**1**]. An injury is a bodily lesion at the organic level, resulting from acute exposure to physical agents such as mechanical energy, heat, electricity, chemicals, and ionising radiation interacting with the body in amounts or at rates that exceed the threshold of human tolerance [**2**]. Injuries often result from road traffic crashes, falls, burns, poisoning, animal bites, cuts and violence [**3**].

Globally, 4.8 million deaths occur each year from injuries with 973 million more people sustaining non-fatal injuries [**1**]. In 2015, injuries contributed to 10% of all disability adjusted life years (DALYs) lost in Africa, with road traffic injuries (RTIs) contributing the greatest burden [**4**]. In Uganda, injuries are the 10th leading cause of DALYs with RTIs, burns, falls, drowning, and inter-personal violence being the most prevalent [**4**]. In 201**5**, injuries in Mbarara District contributed to 1% of the total injury burden in the country [**5**].

A study at Mbarara Regional Referral Hospital showed that, on average, three patients presented with an injury in a day [**6**]. However, most injury reports are facility-based, from hospitals and police records [**7**]. Facility-based reports do not capture injury events that are not reported and are limited in providing information on factors associated with non-fatal injuries [**8**]. Also, most of the reporting is mortality based, yet fatal injuries are only a small fraction of the total burden. Many non-fatal injuries therefore remain unreported in the communities thus underestimating the injury burden [**7**,**9**].

Studies show that non-fatal injuries have economic, social and psychological consequences and sometimes lead to disability [**1**,**7**,**10**,**11**]. The consequences of non-fatal injuries greatly impact an individual's life, family and society as a whole.

Most previous studies on injuries have focused on particular causes of injuries such as road traffic crashes (RTCs), burns, drowning but not on all other causes [**6**,**12**]. Focus on particular causes of injuries leads to increased attention to those specific types of injuries whose data is available while other types of injuries continue to increase unnoticed. Reducing the burden of non-fatal injuries requires implementing interventions informed by epidemiological data on all types of injuries [**13**]. We therefore conducted a household survey in Mbarara Municipality to identify and describe all non-fatal injury events that occurred from December 2016 to June 2017 and the associated factors.

Methods

Study site

We conducted the study in Mbarara Municipality, Mbarara District. Mbarara District is located in southwestern Uganda about 290 kilometres from Kampala. (**Figure 1**). Mbarara Municipality has a population of 195,013 people with six divisions, 22 wards and 170 villages as per the National Population and Housing Census 2014 [**14**]. Mbarara District is one of the fastest growing districts in Uganda. In 2017, Mbarara was ranked the 1stdistrict in the country with high numbers of death by mob action and the 2ndwith high numbers of homicide cases [**15**].

Study design and population

We conducted a cross-sectional study of non-fatal injuries in Mbarara Municipality between May and June 2017. It was a household survey employing quantitative methods of data collection. We included household members of all ages who had lived in Mbarara municipality for at least three months before the study period.

Sample size estimation

We arrived at the sample size of 212 households with 966 household members using the World Health Organisation (WHO) formula for calculating households in a community survey

$$(n = [4\ (r)\ (1\text{-}r)\ (f)\ (1.1)]\ /\ [(e2)\ (p)\ (nh)])$$

where n = number of households, 4 = the factor to achieve 95% level of confidence, r = estimated prevalence of injuries in the community, 55.6% [**12**], f = design effect, 2 [**16**] , 1.1 = 10% non-response rate, e = margin error to be tolerated, p = the proportion of the total population that the smallest subgroup comprises, 1 (whole population), nh = average household size,4 [**14**].

Sampling procedure

Our study was based on the sampling of households, and we used a multi-stage sampling technique from the division to the household level (**Figure 2**). We divided the six divisions of Mbarara Municipality into two strata - urban and rural, based on the population density and characteristics as per the National Population and Housing Census 2014 [**14**]. One division was randomly selected from each stratum. In each division, simple random sampling proportionate to size was used to select villages to participate in the study (Panel 1). Ten villages were conservatively added in the urban division to cater for the differences in injury patterns between urban and suburban areas as described by Kobusingye et al. [**7**]. In each sampled village, systematic sampling was used to identify the number of households visited (Panel 1).

In each village, the complete list of all households was obtained from the local village chairperson and the 'nth' interval was determined, n^{th}being the total number of households in the village/sample size of households needed in that village. To select a starting point, we stood at the centre of the village as identified by the help of the village chairperson. At that point, we rolled a pen to determine the direction of the start point, which was the direction facing the ballpoint of the pen. After listing and numbering the households in the chosen direction, we randomly selected the starting household using a table of numbers. Subsequent households were selected with every 'nth' house in that direction. In case we reached the other boundary of the village before completing the sample required, we took another direction after rolling the pen again.

At the household level, we interviewed only one person (most senior female representative of the household head) who gave information about all household members. In the absence of the female representative, we interviewed the spouse or the eldest person (≥ 18 years of age) who was present. When present, the female representative of the household head was the most preferred respondent because they are deemed more knowledgeable about events on their other household members. Sampled households with no occupants present at the time of the visit were revisited one more time, and if on the second time no one was present, the next household was considered as a replacement.

Study Variables

We collected self-reported information on demographics, non-fatal injury occurrence, injury event characteristics and cause of non-fatal injury. We used a structured questionnaire adapted from WHO Guidelines for conducting community surveys on injuries to obtain data on the study variables [**4**]. Interviews were carried out in the local language with a translated questionnaire. We defined non-fatal injury as any physical harm due to road traffic crashes, burns, cuts/stabs, blunt injury, poison, near-drowning, animal bites, falls, gunshots and other causes that did not lead to death but instead resulted in losing one or more days of usual daily operating activity. The most recent non-fatal injury (within a 6 month recall period; December 2016 to June 2017) which occurred in Mbarara Municipality resulting in loss of at least one day of usual daily operating activity was the non-fatal injury considered. We used a recall period of 6 months to reduce the possibility of recall bias. A household member was regarded as a usual resident of the household who lived and shared meals in the same dwelling. Cause of non-fatal injury was classified based on 'external cause of injury' such as road traffic crash, fall, burns, poisoning and others as per the International Classification of Diseases (ICD) -11 [**17**].

We assessed socioeconomic status by evaluating 11 household assets of the family. That is: television, radio, mobile phone, bicycle, motorcycle, motor vehicle, a piece of land, large farm animals like cattle, goats and sheep, small farm animals like poultry, manufactured beds and house wall made of brick [**18**]. This method has been used in the Uganda Demographic and Health survey to determine the wealth index of the population [**18**]. A study in Uganda on the prevalence of diabetes and pre-diabetes among persons aged 35 to 60 years in Eastern Uganda also used a similar approach [**19**].

Data analysis

We entered data in Epi Info Version 7 and later exported to Stata 14 (StataCorp, College Station, TX) for cleaning and analysis. We summarised participant demographics, injury occurrence and injury event characteristics using frequencies and proportions. We used Principle Component

Analysis (PCA) to analyse for socioeconomic status and outcomes coded into four parts of lowest quartile, second quartile, middle quartile and fourth quartile.

Each household item was weighted, and a total score for each household generated in Stata 14 (StataCorp, College Station, TX). Participants' total scores were then grouped into quartiles. Items that were more unequally distributed between households were given more weight [**20**]. Also, variables with low standard deviations carried a low weight; for example, an asset which all households owned or which no households owned exhibited no variation between households; hence was zero weighted [**21**]. Households were then categorized into quartiles comprising lowest quartile, second quartile, third quartile and fourth quartile.

We conducted bivariate analysis to generate unadjusted prevalence ratios and chi-squared values. We conducted multivariable analysis to identify potential factors independently associated with non-fatal injuries while controlling for potential confounding. Independent variables that were statistically significant at the bivariate analysis at $p<0.2$ and those known from the literature to be associated with injuries were considered for modelling in the multivariable analysis as recommended by In Lee [**22**]. Given the high prevalence of the outcome from our study (non-fatal injury prevalence, 18.2%), we used modified Poisson regression model via generalized linear models to estimate unadjusted and adjusted prevalence ratios (PRs) and corresponding 95% Confidence Intervals of factors associated with non-fatal injury prevalence [**8**]. Modified Poisson regression was preferred over logistic regression because when the proportion of the outcome is >10%, odds ratios give biased estimates of prevalence ratios [**9**, **10**].

Ethical approval

This study was approved by the Higher Degrees Research and Ethics Committee of Makerere University, School of Public Health. We obtained permission to conduct the study from Mbarara Municipal Council offices. We also obtained written informed consent from the study participants. The data obtained was also treated with strict confidentiality: stored in password-protected computers only accessed by the research supervisor and the Principal Investigator. We referred participants who complained of persistent pain and injuries to the nearest health facility for medical attention.

Results

Socio-demographic characteristics

Overall, we included 966 individuals from 212 households. The median age of participants was 20 years (Q1=0.3; Q3=68), 24.8% (240/966) were aged 16-25 years, and 53.5% (517/966) were females. Almost half, 48.9% (472/966) of the participants were in the middle wealth quartile, and 71.5% (691/966) had attained either or both primary or secondary education (**Table 1**).

Prevalence of non-fatal injuries

The prevalence of all non-fatal injuries was 18.2% (176/966) of which 92% (162/176) were unintentional non-fatal injuries. Participants aged ≥35 years had the highest prevalence of non-fatal injuries at 22.7% (40/176). Non-fatal injuries were common among males at 54.6% (96/176), and the urban division registered the highest number of non-fatal injuries at 60.2% (106/176) see **Table 2**.

Causes of non-fatal injuries

The reported highest cause of non-fatal injuries was falls 27.3% (48/176) followed by RTIs 26.7% (47/176) and burns 16.5% (29/176). Poisoning 2.8% (5/176) constituted the lowest (**Figure 3**). Burns were the common cause of non-fatal injuries at 32.3% (10/31) among participants aged 0-5 years. Falls 47.2% (17/36) and cuts 19.4% (7/36) were highest among participants aged 6-15 years and RTIs highest among those aged over 35 years at 45% (18/40).

Injury event characteristics

A small proportion 5.1% (9/176) of the injured people had consumed alcohol before the injury event. More than half 53.2% (25/47) of the RTIs victims were travelling on motorcycles at the time of injury, 53.2% (25/47) were speeding and 80% (20/25) of the motorcycle riders had never used a helmet while riding. Half of the fall victims 52.1%

(25/48) fell while walking, and hot liquids were the leading cause of burns at 72.4% (21/29). For violence 7.9% (14/176), strangers were the common perpetrators of violence at 42.8% (6/14) followed by intimate partners at 28.6% (4/14). An equal proportion, 40% (2/5) were poisoned by a cleaning agent and poisonous plant (**Table 3**).

Factors associated with non-fatal injuries

At bivariate analysis, non-fatal injury was associated with being male (unadjusted PR = 1.4, 95% CI: 1.1 - 1.8), a casual labourer (unadjusted PR = 2.0, 95% CI: 1.1 - 3.6), staying in an urban division (unadjusted PR = 1.6, 95% CI: 1.2 - 2.1), and being a non-native (unadjusted PR = 0.3, 95% CI: 0.2 - 0.3). After adjusting for confounders, factors that remained statistically significant regarding association with non-fatal injury were occupation as casual laborer (adjusted PR=2.1, 95% CI: 1.2 - 3.7), urban residency, Kakoba division (adjusted PR=1.5, 95% CI: 1.1 - 1.9), and being a non-native (adjusted PR=1.7, 95% CI: 1.3 - 2.3) see **Table 3 (Suite)**.

Discussion

In this community survey in Mbarara Municipality to identify and describe all non-fatal injury events that occurred from December 2016 to June 2017 and the associated factors, we found a non-fatal injury prevalence of 18.2%, 92% of them being unintentional. This prevalence was higher in comparison to the prevalence of 1.3% reported in a study conducted at Iganga-Mayuge Health and Demographic Surveillance Site (IM-HDSS), Uganda [**23**]. The higher prevalence in Mbarara Municipality could be related to its location, more urbanized, thus more exposed to many risk factors for injuries. A study carried out in multiple countries in sub-Saharan Africa also reported a lower prevalence of 6.6% [**15**]. The high prevalence of reported non-fatal injury in our study was expected as injury prevention in Uganda is not proactive. Measures such as sensitisation on prevention of injuries, preparedness of firefighting equipment, checking for drunk driving, speed limit, use of helmets are taken in the wake of increased injury burden and are poorly enforced [**26**]. A high prevalence of non-fatal injuries implies a reduced quality of life of people and consequently reducing their life expectancy and affecting the country's economic development.

Overall, falls were the leading cause of non-fatal injury in our study, and most of them occurred when walking. Among adults, falls were majorly due to slips when walking and in children most falls occurred during play. The high prevalence of falls may be due to unsafe neighbourhoods and poor parental supervision for children during play. Similarly, falls as the major causes of injury have been reported in rural community studies from Sudan, India and Abu Dhabi [**8**,**24**,**27**,**28**]. Falls were common among all age groups which reveals the need for interventions across the entire lifespan and not just for the children and elderly which had been the focus of interventions hitherto [**29**]. Falls have short and long-term effects that significantly impact one´s social and economic life most especially when they result in disability [**30**].

Motorcycles were the most significant contributor to RTIs perhaps because they are increasingly being used as a major means of transportation in Uganda yet they remain unregulated in most towns [**31**]. Studies from other districts within Uganda, namely Gulu in Northern Uganda and at Mulago referral hospital in Kampala, show similar results of motorcycles' contributing to RTIs [**32**–**34**]. Despite the overwhelming evidence that speeding increases the risk of a crash, most motorists often drive over the speed limit in Mbarara Municipality [**34**]. More so, a big proportion (80%) of motorcycle users had never used a helmet. Our finding is contrary to a study in Uganda which showed otherwise with more than 80% of motorcyclists having used a helmet at the time of the crash [**35**]. This may be due to the difference in enforcement of helmet use at the time the two studies were carried out. Bishai *et al.* (2008) found traffic enforcement to be a cost-effective intervention in reducing road traffic crashes [**36**] suggesting the need for vigilance in traffic law enforcement and rider sensitisation.

We found that non-natives were more likely to report injury compared to the natives. Majority of the non-natives come to Mbarara District as casual labourers and are thus more likely to be exposed to harsh working conditions and risky behaviour to earn a living. Similar, findings have been reported in other studies in Abu Dhabi and Kenya where non-natives were found to be more injured than the natives [**28**,**37**]. Casual labourers were also more prone to injuries possibly because of the unsafe working

conditions at their places of work. The unsafe conditions casual labourers are exposed to at work are as a result of the weak enforcement of the occupational health and safety law in Uganda [**38**,**39**]. Similar studies in Uganda, Ethiopia and Iran revealed similar findings with a high number of casual labourers being injured [**12**,**40**,**41**]. Increased injury prevalence among casual labourers may result in low productivity and loss of earnings.

To our knowledge, this was the first community survey on non-fatal injuries in Mbarara District focusing on all causes of injuries. The study, however, had some limitations such as recall bias since it involved remembering events in the past 6 months and was based on self-reporting. During the interviews, respondents were allowed sufficient time to adequately recall the events of the past to minimise the recall bias. Additionally, interviewing only one person on injury-related information for all members of the household may have resulted in information bias. However, this potential bias was mitigated by verifying responses with the family members who were available at the time of the interview. The study assessed non-fatal injuries for six months hence we were unable to show the extent of variation by season. However, the available information from this study is beneficial, as only RTIs tend to be seasonal.

Conclusion

The prevalence of injuries was high in Mbarara Municipality, the majority of them being unintentional and caused by falls and RTIs. These findings reveal a gap in injury prevention in Uganda that needs to be addressed to improve the quality of life and reduce the number of avoidable hospital visits that continue to burden the health system. Home improvement campaigns promoting safer homes should be implemented encouraging promotion of levelled grounds and supervision of children during play. Casual labourers and people in self-employment were more injured in our study calling for inspection of workplaces for safety measures and the strengthening of enforcement of occupational health and safety laws.

Consent for publication

We sought consent to publish our study from the Fogarty International Center of the U.S. National Institutes of Health (Chronic Consequences of Trauma, Injuries, Disability Across the Lifespan: Uganda) and Makerere University School of Public Health.

Availability of data and materials

Data and materials can be made available by the corresponding author based on reasonable request.

Competing interests

The authors declare no competing interests.

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Authors´ contributions

RN conceived the idea and designed the study; led data analysis and interpretation; developed the first draft of the manuscript and revised based on the co-authors comments and suggestions. ANK, DM, DB, LB, OA contributed to data interpretation, revised the manuscript critically for important intellectual content; ensured the requirements of submission of the manuscript are met. FO, FM contributed towards analysis and interpretation of the data to agree with results and conclusion; revised the manuscript and editing. NP, GP, AB, OK made contribution towards content review for expert opinion from study design and manuscript writing. KM, JS supervised the study from designing to writing of the manuscript. All authors read and agreed to the final version of the manuscript for publication.

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Annex

Annex 1: Panel 1: Sampling Strategy for Villages and Households

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Table 1: Socio-demographic characteristics of community members of Mbarara Municipality, December 2016 - May 2017

Characteristic	Frequency (N=966)	Percentage
Age (years)		
0-5	152	15.7
6-15	222	23
16 -25	240	24.8
26-35	165	17.1
> 35	187	19.4
Sex		
Male	449	46.5
Female	517	53.5
Native		
Yes	715	74
No	251	26
Marital status		
Single	571	59.1
Married	335	34.7
Separated / divorced	35	3.6
Widowed	25	2.6
Educational level		
None	108	11.2
Primary	406	42
Secondary	285	29.5
Tertiary	167	17.3
Occupation		
Formal employment	99	10.3
Self-employment	140	14.5
Unemployed	141	14.6
Student	402	41.6
Casual laborer	184	19.1
Wealth index		
Lowest quartile	72	7.5
Second quartile	180	18.6
Middle quartile	472	48.9
Fourth quartile	242	25.1
Division		
Urban	473	48.9
Rural	493	51
Length of stay (years)		
< 1	139	14.4
1 to 5	365	37.8
6 to 10	184	19.1
>10	278	28.8

Table 2: Distribution of non-fatal injuries among community members of Mbarara municipality, December 2016 - May 2017		
Characteristic	**Frequency (N=176)**	**Percentage**
Injury Intent		
Unintentional	162	92.1
Intentional	14	7.9
Age (years)		
0-5	31	17.6
6-15	36	20.5
16 -25	38	21.6
26-35	31	17.6
> 35	40	22.7
Sex		
Male	96	54.6
Female	80	45.4
Native		
Yes	108	61.4
No	68	38.6
Marital Status		
Single	94	53.4
Married	70	39.8
Separated / divorced	7	3.9
Widowed	5	2.8
Education level		
None	21	11.9
Primary	83	47.2
Secondary	45	25.6
Tertiary	27	15.3
Occupation		
Formal employment	12	6.8
Self-employment	30	17.1
Unemployed	21	11.9
Student	68	38.6
Casual laborer	45	25.6
Wealth index		
Lowest quartile	16	9.1
Second quartile	44	25
Middle quartile	80	45.5
Fourth quartile	36	20.5
Division		
Urban	106	60.2
Rural	70	39.8
Length of stay (years)		
< 1	23	13.1
1 to 5	85	48.3
6 to 10	24	13.6
>10	44	25

Table 3: Injury event characteristics of participants	
Characteristic	**Frequency (%)**
Alcohol use before injury	
Yes	5.1 (9/176)
No	94.9 (167/176)
Road Traffic	
Mode of travel	
Walking	10.6 (5/47)
Motorcycles	53.2 (25/47)
Bicycle	6.4 (3/47)
Car	29.8 (14/47)
Road user category	
Pedestrians	14.9 (7/47)
Driver	38.3 (18/47)
Passenger	46.8 (22/47)
Seat belt use	
All the time	28.6 (4/14)
Sometimes	64.3 (9/14)
Never	7.1 (1/14)
Helmet use	
All the time	8.0 (2/25)
Sometimes	12.0 (3/25)
Never	80.0 (20/25)
Over speeding at time of injury	
No	46.8 (22/47)
Yes	53.2 (25/47)
Falls	
Height of fall (meters)	
Same level	52.1 (25/48)
<2	27.1 (13/48)
≥2	20.8 (10/48)
Fall from	
Stairs	8.3 (4/48)
Ladders	8.3 (4/48)
Construction work	4.2 (2/48)
Tree	14.6 (7/48)
Balcony	6.3 (3/48)
Walking	52.1 (25/48)
Vehicle	6.3 (3/48)
Burns	
Cause	
Hot liquid	72.4(21/29)
Hot object	20.7 (6/29)
Flames/ fire	6.9 (2/29)
Violence	
Perpetrator	
Intimate partner	28.6 (4/14)
Stranger	42.8 (6/14)
Others	28.6 (4/14)
Poisoning	
Substance	
Cleaning agent	40.0 (2/5)
Poisonous plant	40.0 (2/5)
Expired food	20.0 (1/5)

Table 3(suite): Injury event characteristics of participants				
Variable	**Injured persons % (n/N)**	**Unadjusted PRs**[1]	**Adjusted PRs**	**P-value**
Age (years)				
0-5	20.4 (31/152)	1.0	1.0	
6-15	16.2 (36/222)	0.8 (0.5, 1.2)	0.7 (0.4, 1.11)	0.131
16-25	15.9 (38/240)	0.8 (0.5, 1.2)	0.6 (0.4, 1)	0.048
26-35	18.8(31/165)	0.9 (0.6, 1.44)	0.6 (0.3, 1.1)	0.093
>35	21.4 (40/187)	1.1 (0.7, 1.6)	0.8 (0.4, 1.4)	0.428
Sex				
Female	15.5 (80/517)	1.0	1.0	
Male	21.4 (96/449)	1.4 (1.1, 1.8)*	1.3 (1, 1.7)	0.051
Native				
Yes	15.1 (108/715)	1.0	1.0	
No	27.1 (68/251)	0.3 (0.2, 0.3)*	1.7 (1.3, 2.3)**	**0.000**
Marital status				
Single	16.5 (94/571)	1.0		
Married	20.9 (70/335)	1.3 (0.9, 1.7)		
Separated	20.0 (7/35)	1.2 (0.6, 2.4)		
Widowed	20.0 (5/25)	1.2 (0.5, 2.7)		
Educational level				
None	19.4 (21/108)	1.0		
Primary	20.4 (83/406)	1.1 (0.7, 1.6)		
Secondary	15.8 (45/285)	0.8 (0.5, 1.3)		
Tertiary	16.2 (27/167)	0.8 (0.5, 1.4)		
Occupation				
Formal employment	12.1 (12/99)	1.0	1.0	
Self-employment	21.4 (30/140)	1.8 (0.9, 3.3)	1.9 (1.1, 3.6)*	**0.026**
Unemployed	14.9 (21/141)	1.2 (0.6, 2.4)	1.1 (0.5, 2.2)	0.899
Student	16.9 (68/402)	1.4 (0.8, 2.5)	1.3 (0.7, 2.6)	0.395
Casual labourers	24.5 (45/184)	2.0 (1.1, 3.6)*	2.1 (1.2, 3.7)**	**0.015**
Wealth Index				
Lowest quartile	22.2 (16/72)	1.0	1.0	
Second quartile	24.4 (44/180)	1.1 (0.7, 1.8)	1.4 (0.9, 2.3)	0.155
Middle quartile	16.9 (80/472)	0.8 (0.5, 1.2)	1 (0.6, 1.6)	0.956
Fourth quartile	14.9 (36/242)	0.7 (0.4, 1.1)	0.9 (0.5, 1.5)	0.557
Division of stay				
Rural	14.2 (70/493)	1.0	1.0	
Urban	22.4 (106/ 473)	1.6 (1.2, 2.1)*	1.5 (1.1, 1.9)**	**0.006**
Length of stay (years)				
< 1	16.6 (23/139)	1.0		
1 to 5	23.3 (85/365)	1.4 (0.9, 2.1)		
6 to 10	13.0 (24/184)	0.8 (0.5, 1.3)		
> 10	15.8 (44/278)	0.9 (0.6, 1.5)		

Panel 1: Sampling Strategy for Villages and Households		
Level of sampling	**Urban**	**Rural**
Division	Total=3 1 selected	Total=3 1 selected
Villages (Sampling proportionate to size)	Total=21 (21/82)*100 = 26% (26/100)*21 = 5 villages 10 villages were conservatively added to cater for the differences in injury patterns between rural and urban areas (7) 15 villages selected	Total= 61 (61/82)*100 = 74%. (74/100)*61 = 45 villages 45 villages selected
Households (Sampling proportionate to size	(15/60)*100 =25% of the sampled households needed (25/100) *212 =53 households selected Approximately 4 households per village.	(45/60)*100 =75% of the sampled households needed (75/100)*212 =159 households selected Approximately 4 households per village.

Figure 1: The map of Uganda showing the location of Mbarara District

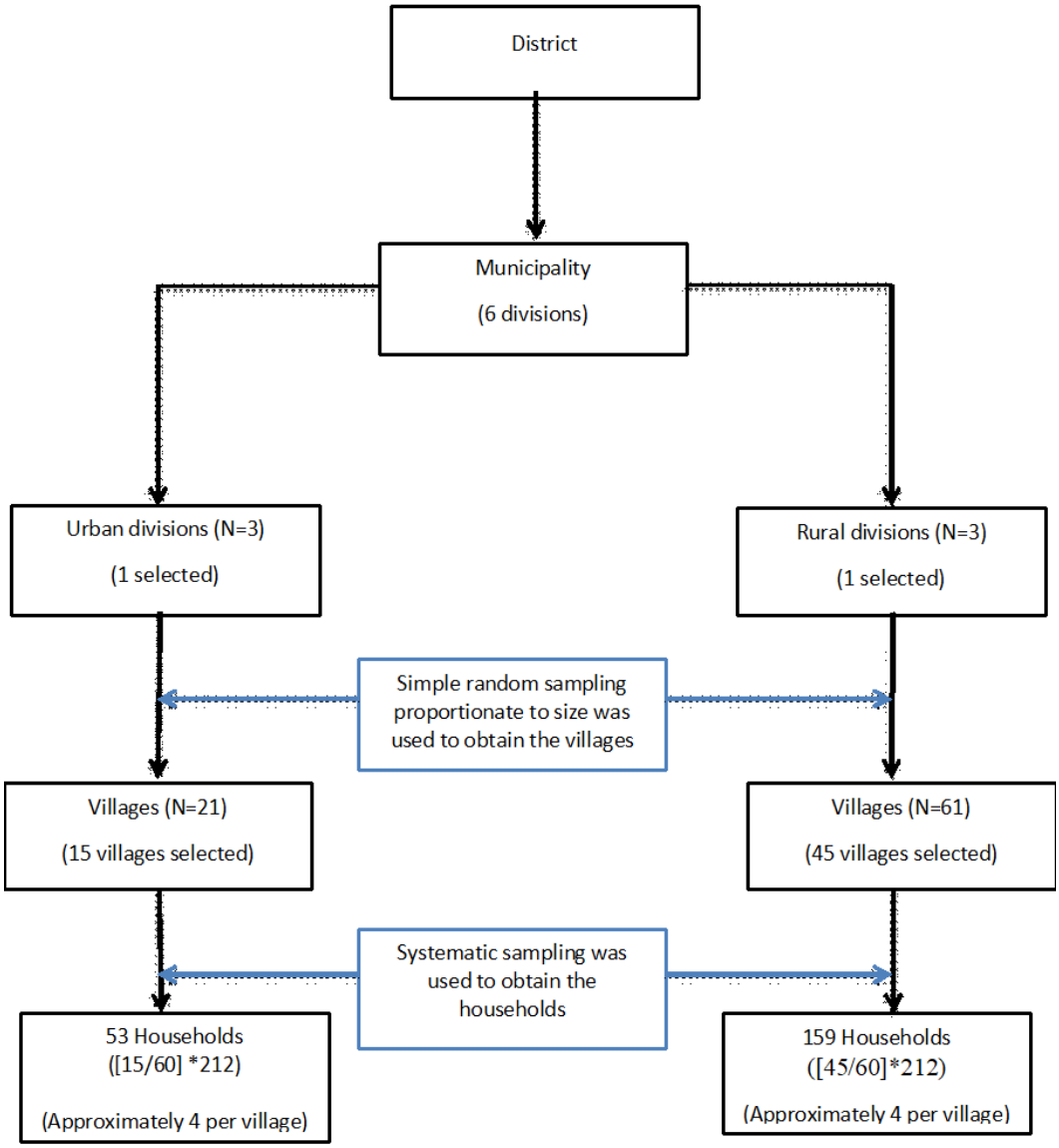

Figure 2: Sampling procedure for the community study on non-fatal injuries and factors associated in Mbarara Municipality from May to June 2017