RESEARCH Open Access

Prevalence and predictors of injuries in Kenya: findings from the national STEPs survey

Gladwell Koku Gathecha[1*], Christine Ngaruiya[2], Wilfred Mwai[1], Ann Kendagor[1], Scholastica Owondo[1], Loise Nyanjau[1], Duncan Kibogong[3], Wilson Odero[4] and Joseph Kibachio[1,5]

Abstract

Background: Injuries are becoming an increasingly important public health challenge globally, and are responsible for 9% of deaths. Beyond their impact on health and well-being, fatal and non-fatal injuries also affect social and economic development for individuals concerned. Kenya has limited data on the magnitude and factors associated with injuries. This study sought to determine the magnitude and risk factors for injuries in Kenya and to identify where the largest burden lies.

Methods: A national population-based household survey was conducted from April–June 2015 among adults age 18–p

Background

Injuries are becoming an increasingly important public health challenge globally, responsible for 9% of deaths [1]. The mortality from injuries is nearly twice that from HIV, malaria and tuberculosis yet the global efforts have not responded adequately to reduce this burden [1]. The Global Non Communicable Diseases (NCD) Action Plan [2] does not include injuries in its scope unlike the Brazzaville declaration on NCDs and the Kenya National Strategy for NCDs and Injuries [3]. Injuries were intentionally included after realizing the significant burden they produce in the region and the slow progress experienced in reducing this burden despite the availability of proven evidence-based strategies [4, 5]. This is a commendable step towards prioritizing efforts towards injury prevention and control in the African region which bears the largest brunt of deaths due to injuries [1]. It should also be noted that projection for injuries are estimated to be worse for low and middle income countries [6

blood pressure. The third step involves the collecting of biochemical measurement such as fasting blood glucose and is usually done the following day after step one and two have been done. Data collection was done using a Personal Digital Assistance (PDA) which was loaded with the eSTEPs questionnaire. STEPs was a nationally representative cross-sectional household survey that used the National Sample Survey and Evaluation Programme V (NASSEP V) household sampling frame for sampling determined by the Kenya National Bureau of Statistics. A three-stage cluster sample design was used to select clusters, households and eligible individuals. One individual was selected in the households. Details of its methods have been described elsewhere [24].

An injured person was described as one who had either been injured seriously in a road traffic crash (road traffic injury), had other serious unintentional/accidental injury (accidental injury), or had been seriously injured in a violent incident (violent incident) within the preceding 12 months. Unintentional/accidental injuries included injuries such as a fall, a cut or other injury such as poisoning, near drowning, electrocution. Violent incidents included intentional use of physical force resulting to injury. A serious injury was

Discussion

This population-based survey provides the first national estimates on non-fatal injuries in Kenya. Our study additionally identified factors associated with injuries that include social, demographic, behavioral and biological. This is important as it helps to identify targeted interventions that could have a greater impact in reducing the burden of injuries. Fifteen percent of the respondents reported that they had been seriously injured in the past 12 months and required medical attention. This proportion is quite high and needs to be addressed as injuries have far reaching effects on individuals, societies and the health care systems [1, 8]. This is higher than what has been reported in developed countries such as Germany with 10.7% [25]. and developing countries such as Sierra Leone with 12.4% [26]

3.87; 95% CI = 2.24–6.68), being of younger age: 18–29 age group (OR = 2.96; 95% CI = 1.48–5.90), and 40–49 age group (OR = 2.77; 95% CI = 1.38–5.55) having the highest odds. Current smokers were also more likely to have been involved in a RTI (OR = 2.08; 95% CI = 1.31–3.32). Furthermore, students (OR = 2.00; 95% CI = 1.24–3.22) and individuals who were underweight (OR = 1.57; 95% CI = 1.18–2.09) were more likely to be involved in other accidental injuries. Being in the richest quintile (OR = 0.32; 95% CI = 0.20–0.50) and the fourth quintile (OR = 0.43; 95% CI = 0.29–0.63) were protective against encountering other accidental injuries. Violent incidents were experienced more among respondents age 30–39 years (OR = 1.76; 95% CI = 1.04–2.99), binge drinkers (OR = 2.34; 95% CI = 1.57–3.49) and current smokers (OR = 1.73; 95% CI = 1.14–2.63). Respondents who were obese were less likely to be involved in a violent incident (OR = 1.73; 95% CI = 1.14–2.63).

between 7 and 22% in potential per capita gross domestic growth over a 24-year period [36]. In our study, this pattern was true for only other accidental injuries where respondents from the two richest quintiles had less likelihood of getting other unintentional injuries. Individuals from poorer backgrounds tend to live, work and travel in less safe conditions [1].

The strongest association between injuries and heavy episodic drinking (binge) was found among respondents who had been involved in a violent incident. Similar findings have been found elsewhere [18

It has been advanced that the association between smoking and injury is as a result of direct toxicity, distractibility, smoking-associated medical conditions and confounding factors, including personality or behavioral characteristics [41]. There is need to heighten public health awareness to healthcare workers and the public on this additional harmful association of smoking.

Road traffic injuries have been a long standing public health concern in Kenya [14, 43]. Nearly 4 % of the respondents had been involved in a road traffic crash and sustained injuries that required medical attention. Surprisingly there were a higher proportion of respondents injured in the rural areas than urban areas where the level of motorization is higher. It is possible that the a high influx of motorcycles and bicycles in the rural areas could be responsible for this [44]. The consistent use of seat belt and helmets was reported by 13% and 6% of the respondents respectively. A study conducted in two towns in Kenya, Thika and Naivasha, found the prevalence of helmet use among riders to be 25.7% and 37.2% respectively [45]. These levels remain worryingly low despite the numerous heightened mass media campaigns conducted by various road safety agencies. To bring meaningful change in this area, enforcement efforts have to

Table 5 Factors associated with injuries

Predictor	Road traffic injuries		Accidental injury		Violent incident	
	OR (95% CI)	P > z	OR (95% CI)	P > z	OR (95% CI)	P > z
Sex						
Female	1.00		1.00		1.00	
Male	3.87 (2.24, 6.68)	0.000	1.24 (0.96, 1.61)	0.096	1.17 (0.76, 1.79)	0.485
Residence						
Rural	1.00		1.00		1.00	
Urban	1.20 (0.77, 1.86)	0.425	0.89 (0.67, 1.17)	0.392	1.14 (0.75, 1.74)	0.551
Age group						
50–69	1.00		1.00		1.00	
18–29	2.96 (1.48, 5.90)	0.002	0.82 (0.59, 1.13)	0.228	1.03 (0.59, 1.81)	0.919
30–39	1.65 (0.80, 3.41)	0.174	0.89 (0.65, 1.23)	0.482	1.76 (1.04, 2.99)	0.035
40–49	2.77 (1.38, 5.55)	0.004	0.96 (0.68, 1.35)	0.806	1.32 (0.73, 2.37)	0.361
BMI						
Normal	1.00		1.00		1.00	
Underweight	0.82 (0.45, 1.52)	0.536	1.57 (1.18, 2.09)	0.002	1.45 (0.94, 2.23)	0.090
Overweight	0.93 (0.55, 1.60)	0.804	1.18 (0.89, 1.56)	0.260	0.78 (0.47, 1.31)	0.354
Obese	1.78 (0.95, 3.34)	0.073	1.03 (0.68, 1.55)	0.905	0.28 (0.09, 0.89)	0.031
Episodic alcohol drinking						
No alcohol	1.00		1.00		1.00	
Binge	1.15 (0.73, 1.80)	0.547	1.27 (0.95, 1.70)	0.105	2.34 (1.57, 3.49)	0.000
Non-heavy	0.55 (0.22, 1.39)	0.208	0.70 (0.42, 1.17)	0.172	0.88 (0.41, 1.88)	0.736
Education level						
No formal education	1.00		1.00		1.00	
Primary education	2.29 (0.83, 6.32)	0.110	2.52 (1.69, 3.77)	0.000	1.13 (0.65, 1.97)	0.662
Secondary and above	1.78 (0.62, 5.10)	0.285	2.57 (1.65, 4.01)	0.000	0.53 (0.27, 1.03)	0.063
Occupation						
Unemployed	1.00		1.00		1.00	
Employed	1.18 (0.64, 2.18)	0.597	1.08 (0.78, 1.49)	0.641	1.05 (0.65, 1.70)	0.833
Student	0.63 (0.19, 2.12)	0.456	2.00 (1.24, 3.22)	0.005	1.51 (0.67, 3.43)	0.319
Homemaker	1.52 (0.68, 3.38)	0.306	0.92 (0.62, 1.36)	0.671	0.70 (0.37, 1.32)	0.273
Wealth Quintile						
Poorest	1.00		1.00		1.00	
Second	0.88 (0.41, 1.91)	0.753	0.68 (0.5, 0.92)	0.014	1.37 (0.84, 2.22)	0.205
Middle	2.76 (1.40, 5.45)	0.003	0.82 (0.60, 1.13)	0.228	1.01 (0.58, 1.74)	0.977
Fourth	1.68 (0.80, 3.53)	0.170	0.43 (0.29, 0.63)	0.000	1.00 (0.55, 1.83)	0.999
Richest	1.04 (0.44, 2.44)	0.930	0.32 (0.20, 0.50)	0.000	0.55 (0.26, 1.15)	0.114
Marital status						
Not married	1.00		1.00		1.00	
Married	2.09 (1.18, 3.69)	0.011	1.13 (0.82, 1.55)	0.459	0.8 (0.51, 1.27)	0.350
Formerly married	2.68 (1.29, 5.57)	0.008	1.62 (1.08, 2.44)	0.020	0.93 (0.51, 1.69)	0.811
Smoke						
No	1.00		1.00		1.00	
Yes	2.08 (1.31, 3.32)	0.002	1.17 (0.84, 1.61)	0.348	1.73 (1.14, 2.63)	0.011

15. Njihia BN, Saidi HOJ. Preliminary data from a de novo trauma registry. Ann African Surg. 2016;13:7–11.
16. Ghaffar A, Hyder AA, Masud TI. The burden of road traffic injuries in developing countries: the 1st national injury survey of Pakistan. Public Health. 2004;118:211–7.
17. Azetsop J. Social justice approach to road safety in Kenya: addressing the uneven distribution of road traffic injuries and deaths across population groups. Public Health Ethics. 2010;3:115–27.
18. Schuurman N, Cinnamon J, Walker BB, et al. Intentional injury and violence in Cape Town, South Africa: an epidemiological analysis of trauma admissions data. Glob Health Action. 2015;8:1–9.
19. Liu BC, Ivers R, Norton R, et al. Helmets for preventing injury in motorcycle riders. In: Liu BC (ed) Cochrane Database Syst Rev Chichester: John Wiley & Sons, Ltd. Epub ahead of print 23 January 2008. DOI: https://doi.org/10.1002/14651858.CD004333.pub3.
20. Cummings P. Association of seat belt use with death: a comparison of estimates based on data from police and estimates based on data from trained crash investigators. Inj Prev. 2002;8:338–41.
21. Abbas AK, Hefny AF, Abu-Zidan FM. Seatbelts and road traffic collision injuries. World J Emerg Surg. 2011;6:18.
22. Forjuoh SN. Traffic-related injury prevention interventions for low-income countries. Inj Control Saf Promot. 2003;10:109–18.
23. Ministry of Health. Kenya National Violence and Injury Prevention and Control Action Plan 2018–2022.
24. Ministry of Health, Kenyan National Bureau of statistics WHO. Kenya STEPwise Survey for Non Communicable Diseases Risk Factors 2015 Report 2015; 5.
25. Sass A-C, Stang A. Population-based incidences of non-fatal injuries - results of the German-wide telephone survey 2004. BMC Public Health. 2013;13:376.
26. Stewart K-A, Groen RS, Kamara TB, et al. T. Traumatic injuries in developing countries: report from a Nationwide cross-sectional survey of Sierra Leone. Biophys Chem. 2005;257:2432–7.
27. Lett RR, Kobusingye OC, Ekwaru P. Burden of injury during the complex political emergency in northern Uganda. Can J Surg. 2006;49:51–7.
28. El Tayeb S, Abdalla S, Mørkve O, et al. Injuries in Khartoum state, the Sudan: a household survey of incidence and risk factors. Int J Inj Control Saf Promot. 2013;7300:37–41.
29. Moshiro C, Heuch I, Åstrøm AN, et al. Injury morbidity in an urban and a rural area in Tanzania: an epidemiological survey. BMC Public Health. 2005;5:11.
30. Sorenson SB. Gender disparities in injury mortality: consistent, persistent, and larger than you'd think. Am J Public Health. 2011;101:353–8.
31. Granié M-A. Effects of gender, sex-stereotype conformity, age and internalization on risk-taking among adolescent pedestrians. Saf Sci. 2009;47:1277–83.
32. Levant RF PW. A new psychology of men. New York, 2003.
33. Moshiro C, Heuch I, Åstrøm AN, et al. Effect of recall on estimation of non-fatal