



Socioeconomic correlates of trauma: An analysis of emergency ward patients in Yaoundé, Cameroon



Seema Kacker^{a,b}, David Bishai^{b,c}, Georges Alain Etoundi Mballa^d, M.E. Monono^e,
Eric B. Schneider^{a,f}, Marquise Kouo Ngamby^d, Adnan A. Hyder^b, Catherine J. Juillard^{g,*}

^a Johns Hopkins University School of Medicine, Baltimore, MD, USA

^b Department of International Health, Johns Hopkins University Bloomberg School of Public Health, Baltimore, MD, USA

^c Department of Population, Family, and Reproductive Health, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, MD, USA

^d Cameroon Ministry of Health, PO Box 4282, Yaoundé, Cameroon

^e World Health Organization, Africa Regional Office, Brazzaville, Congo

^f Center for Surgery and Public Health, Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA

^g Center for Global Surgical Studies, Department of Surgery, University of California, San Francisco, CA, USA

ARTICLE INFO

Article history:

Accepted 8 December 2015

Keywords:

Socioeconomic status
Trauma
Global health
Cameroon
Epidemiology

ABSTRACT

Introduction: Injury is a significant and increasingly common cause of morbidity and mortality in sub-Saharan Africa; however, the social and economic factors underlying these trends are not well understood. We evaluated the relationship between socioeconomic status (SES) and trauma outcomes using a prospective registry of patients presenting to the largest trauma hospital in Yaoundé, Cameroon. **Methods:** Trauma patients ($n = 2855$) presenting to the emergency ward at Central Hospital, Yaoundé between April 15 and October 15, 2009 were surveyed regarding demographic and socioeconomic background, nature and severity of injuries, treatment, and disposition. A wealth score was estimated for each patient, corresponding to an SES index constructed using principle components analysis of the urban Cameroonian Demographic and Health Survey. Logistic regression was used to evaluate the effects of SES on care-seeking behaviour, injury severity, and treatment outcome. **Main outcome measures:** : SES wealth score, care-seeking prior to visiting hospital, injury severity, treatment outcome.

Results: Patients aged 1–89 presented with road traffic injuries (59.83%), falls (7.76%), and penetrating trauma (6.16%), and had higher SES than the broader urban Cameroonian population. Within the Yaoundé sample, being in the lowest SES quintile was associated with an increased likelihood of having sought care elsewhere before presenting to the hospital (aOR = 3.28, $p < 0.001$), after controlling for background and injury characteristics. Patients in the lowest SES quintile were also more likely to present with moderate/severe injuries (aOR = 4.93, $p < 0.001$), and were more likely to be transferred to the operating room.

Conclusions: Patients presenting to this trauma centre were wealthier than the broader community, suggesting the possibility of barriers to accessing care. Poorer patients were more likely to have severe injuries and more likely to need surgery, but were less likely to seek care from a major trauma centre immediately. Substantial differences in SES between the sample visiting the hospital and the broader community suggest a need for community-based sampling approaches in future trauma research.

© 2015 Elsevier Ltd. All rights reserved.

Introduction

Injuries account for approximately 5.8 million deaths worldwide each year, with greater than 90% of these deaths occurring in

* Corresponding author at: Department of Surgery, University of California San Francisco, 1001 Portrero Ave, SFGH 5, San Francisco, CA 94143, USA.
Tel.: +1 415 206 4626.

E-mail addresses: Catherine.Juillard@ucsf.edu, c.juillard@gmail.com (C.J. Juillard).

low- and middle-income countries (LMICs) [1]. These deaths represent only a small fraction of all injuries; 10–50 times as many people are estimated to be living with permanent disabilities as a result of injury [2]. The three leading causes of death from injuries – road traffic injuries (RTIs), homicide, and suicide – are all expected to rise in rank; by 2030, RTIs are likely to become the 5th leading cause of global mortality. This trend is expected to be especially pervasive in LMICs, as motorization and economic growth increase without commensurate development of healthcare systems [1–3]. The

economic burden of injuries in these settings, including both direct and indirect costs, is significant [4,5].

Within countries, injuries disproportionately affect youth, men, and lower-income individuals and communities [1,6]. Previous studies have demonstrated an inverse relationship between socioeconomic status (SES) and injury risk, as well as between SES and mortality associated with injury [7]. Although the nature of these relationships is likely multifactorial, prior research has suggested that low SES communities are more likely to expose individuals to risks that lead to injury, including poor housing, traffic, crime, and certain types of high-risk work [8]. Additionally, these communities may be less likely to have ready access to transportation to healthcare facilities in emergencies, and may have more limited access to information about injury or behaviours to limit risks [8]. The precise mechanisms underlying these patterns, particularly in LMICs, remain unclear. Few comprehensive injury surveillance systems in these settings are available, and the data sources that do exist are often either limited in scope or unreliable [9,10].

This study aimed to assess the relationship between SES and injury among patients presenting to the largest trauma centre in Yaoundé, Cameroon. A prospective trauma registry was developed to capture data on patient background, injury characteristics, treatment, and outcomes of all trauma patients presenting to the emergency ward [11]. The comprehensive nature of this data source allowed us to investigate associations between SES and patient care-seeking behaviour, injury severity, and patient disposition in an effort to better understand how SES relates to trauma in LMICs.

Methods

We assessed socioeconomic status using data from a prospective study among 2855 patients visiting the largest trauma centre in Yaoundé, Cameroon; data collection methodology has been previously described [11]. In brief, trauma patients presenting to the emergency ward of the Central Hospital of Yaoundé (CHY) between April 15 and October 15, 2009 were interviewed using a structured questionnaire, following patient stabilisation. CHY is a 500-bed tertiary care centre in Yaoundé, the capital of Cameroon, and is estimated by the Ministry of Public Health to handle over 75% of the trauma cases in the city. The survey instrument was based on the WHO Guidelines for Injury Surveillance, prior instruments used in Uganda, and our previous work done in LMICs, and was administered by trained research assistants (Supplemental File) [12–15]. Information on demographics, injury context and mechanism, disposition outcomes, and SES indicators, as defined by the 2004 Demographic and Health Survey (DHS) in Cameroon, was collected [16]. SES indicators included source of drinking water, toilet facility, assets, fuel type, number of rooms in house, flooring material, and possession of mosquito nets.

Injury severity was captured through the Kampala Trauma Score (KTS) [14] and an estimated Injury Severity Score (eISS) [17,18]. Both severity scores were determined by trained research assistants, in conjunction with the hospital physicians on staff. The KTS was a physiologically-based composite measure incorporating age, systolic blood pressure, respiratory rate on admission, neurological status, and the number of serious injuries (see survey form in supplement). The eISS measure was based on clinician-assessed severity of the three anatomic regions that were most severely injured; radiographic studies and operative reports to determine the extent of injury were inconsistently available at CHY.

Using the urban Cameroonian DHS as a reference sample, principal components analysis (PCA) was conducted to transform SES indicators into linearly uncorrelated components explaining as much variation as possible [19]. Factor weights assigned to each

variable were extracted from the first component generated from the PCA, and these weights were applied to the same variables in the Yaoundé dataset. This allowed us to construct an SES score for each patient in the Yaoundé sample reflecting SES relative to the broader urban Cameroonian community (88.2% of patients in our sample lived within Yaoundé).

This SES score was then used as a covariate in a series of univariate and multivariate logistic regressions assessing the relationship of SES and care-seeking behaviour, injury severity, and patient outcomes. All analysis was conducted using STATA version 12.1.

Initially, no imputation was conducted to adjust for missing data in the DHS sample ($n = 4655$, 92.5%); however, in a secondary analysis, multiple imputation by chained equations (STATA 12 command “mi impute”) was used to impute values for the two variables accounting for more than 90% of the missing data (time required to obtain water and if the toilet is shared with other households), and PCA was performed again ($n = 4758$, 94.6%). Imputation did not markedly change the distribution of SES scores. The factor weight estimates were generally consistent with the natural order of categorical variables (water from taps was associated with a higher SES score than water from wells, for example) and the first component accounted for 12.2% of total variation.

SES scores among the CHY patient sample were calculated, first ignoring any missing values ($n = 2183$, 76.5%), and then after using multiple imputation to adjust for missing data ($n = 2303$, 86.2%). Imputing missing values appeared to slightly broaden the spread of SES scores, but did not alter the overall distribution (Supplemental Fig. 1). Threshold SES scores defining DHS sample quintiles were then applied to the Yaoundé patient sample. We used the urban Cameroonian DHS sample to define the principal components because the DHS sample was nationally representative, but patients visiting CHY may not reflect the entire Cameroonian wealth spectrum. By definition, 20% of the DHS sample fell into each of five quintiles, with quintile 1 reflecting the poorest patients and quintile 5 reflecting the wealthiest patients.

Patient characteristics, injury context, injury severity, care-seeking behaviour, treatment, and disposition were summarised and stratified by SES quintile; differences between quintiles were assessed using T-tests and chi-squared tests. Univariate and multivariate logistic regression adjusted for age, sex, and mechanism were then used to further examine the relationship between SES and three specific injury characteristics: care-seeking behaviour, injury severity (as defined by $KTS < 14$), and undergoing surgery.

The study was conducted in collaboration with the Ministry of Public Health in Cameroon and approved by the National Ethics Review Committee in Cameroon, CHY leadership, the Ministry of Public Health, and the Institutional Review Board of Johns Hopkins Bloomberg School of Public Health in the USA.

Results

Relative SES among Yaoundé patients

The variables with the greatest absolute factor weights included having piped water into a dwelling, having a flush toilet, using natural gas, having a dirt/earth floor, and having electricity, a television, a refrigerator, a stove, a car, and a mobile phone (Supplemental Table 1). There were statistically significant differences in patterns of living standards and asset ownership between the injured Yaoundé patient sample and the average urban Cameroonian DHS sample (Table 1). Injured individuals showed superior living status indicators in the domains of water source ($\chi^2 = 843.5$, $p < 0.001$), toilet facilities ($\chi^2 = 311.5$,

Download English Version:

<https://daneshyari.com/en/article/3238695>

Download Persian Version:

<https://daneshyari.com/article/3238695>

[Daneshyari.com](https://daneshyari.com)