

Methods A data collection form was developed using the WHO/Monash Fatal Injury Surveillance in Mortuaries and Hospitals Manual and was implemented in 4 mortuaries (3 urban, 1 rural). Training for project staff, ongoing technical support and monitoring was provided by WHO. The project was led by Forensic Pathologists. Data collection started in 2010, with initial piloting (2010–2011) and implementation after the publication of the manual (2013–present). In 2015, an evaluation was conducted comparing data from the mortuary with data from traffic police, hospital mortality records and with national VR registry.

Results In the initial pilot phase (2010–2011) a total of 112 cases were recorded in the 4 mortuaries. Based on the result of the piloting, the system was revised. Formal implementation started in 2013. By June 2015, a total of 2666 cases were recorded. About two-thirds were from unintentional causes, majority being due to road traffic injuries (RTI). Of the remaining, 6% were due to suicide, 15% from assault. Most of the RTI victims were passengers, motorcyclists and pedestrians. Males were over represented in all causes. Most of the deceased were 18–29 years old. Suffocation/hanging was the main mechanism of injury for suicide cases. While guns and blunt objects were the weapons involved for majority of the homicide deaths. There is a high under reporting of RTI deaths in police and VR systems. With recognition of its limitations, the FIS data from the mortuary is being used to support local injury prevention efforts.

Conclusions Compared to other sources, such as police and VR systems, mortuaries are a better surveillance data source for injury deaths, particularly for RTI deaths. In low-mid income countries, it is feasible to implement a standardised fatal injury data collection process at both rural and urban mortuaries. Local ownership of the system is key for sustainability.

163 VALIDATING WISQARS ESTIMATES OF THE INCIDENCE AND COST OF US INJURIES: A TALE OF TWO DATASETS

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Background Both the US Centres for Disease Control and Prevention's WISQARS system and the Healthcare Cost and Utilisation Program (HCUP) provide sample-based national estimates of injury survivors treated in hospital emergency departments and released (ED cases) or admitted. The WISQARS sample is much smaller but also more quickly available and more fully cause-coded than the HCUP data. For admissions, HCUP weights are quite accurate, computed from a near-census. We compared estimated medical and work loss costs from the two systems.

Methods We applied an updated version of essentially the same published injury cost model to both datasets. The HCUP model combined HCUP data on hospital payments per case with estimates by International Classification of Diseases, 9th Edition-Clinical Modification diagnosis of associated professional fees and lifetime medical costs post-discharge. Work loss costs were estimated from length of stay if admitted and data by diagnosis group on mean days of work loss and the probability of permanent work-related disability. We used 2010 HCUP incidence data to collapse the HCUP costs into WISQARS diagnosis codes.

Results Both data sets estimated 27 million ED cases annually in 2012/13, with annual costs estimated at \$165 billion using HCUP data and \$167 billion using WISQARS data. For admitted injuries, WISQARS estimates of 3 million cases costing \$290

billion exceeded HCUP "gold standard" estimates of 2.7 million (11.5% fewer) and \$245 billion (19% less). WISQARS reported admitted injury trends by cause that HCUP suggested were spurious.

Conclusions WISQARS provides adequate injury incidence and cost estimates for surveillance. Its sample is too thin to support trend analyses by cause or for admissions and its admissions estimates should be replaced or reweighted with HCUP data as they become available. For admitted injuries, the sample of 66 hospitals underlying the WISQARS estimates warrants expansion.

164 ASSESSING VIOLENCE AND INJURY SURVEILLANCE IN THE CARIBBEAN

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Background The Caribbean Region experiences high levels of violence and injury. Limited research is available on the status of existing violence and injury prevention (VIP) efforts and surveillance systems.

Methods The Caribbean Public Health Agency undertook a survey to gather evidence of VIP in 24 member countries. The questionnaire on VIP was developed using available literature on injury surveillance systems. The survey was administered to national epidemiologists and non-communicable disease focal points in October 2015 using an online tool, "Survey Monkey". Questions were asked about the availability in each country of VIP representative surveys, policies, action plans, laws, victim support services, and surveillance systems.

Results Nineteen (79%) countries completed the VIP survey. Only three (16%) countries confirmed having undertaken a nationally representative survey. Twelve (63%) had not developed a national policy and 14 (74%) had not implemented an action plan on VIP. Each country reported the existence of VIP laws and offered victim support services, though average enforcement ranged from 40–79%. Nine (47%) countries indicated using an injury registry and 15 (79%) reported collecting injury data with in-patient records, mainly from public hospitals. All 19 countries confirmed that records of reported violent incidents were maintained by the police. Unique identifiers were generally lacking in registries and police systems. Only four (44%) countries with registries, ten (67%) countries with in-patient injury data, and 12 (63%) countries with police records indicated sharing data with other organisations.

Conclusions Each country reported some level of injury surveillance system; however, such systems should be harmonised to produce more complete baseline data. The use of unique identifiers is required to reduce duplication and effectively link surveillance systems.

165 THE SWEDISH NATIONAL INFORMATION SYSTEM FOR TRAFFIC ACCIDENTS AND INJURIES; EXPERIENCES FROM THE IMPLEMENTATION PROCESS

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Background The process towards a new Swedish information system was launched in 1993 when the Swedish Road

Administration was commissioned by the Swedish government to investigate and propose a development for the Swedish traffic accident data.

The investigation was conducted and as a result the Swedish government commissioned the Swedish Road Administration in 1996 to initiate a new information system covering injuries and accidents in the entire road traffic system.¹

Methods The first data collection in the new common information system – Strada (Swedish Traffic Accident Data Acquisition) – started in four geographic areas in 1999.

Since 2003 the official statistics of road traffic injuries are based on data extracted from the police reports in Strada.

From 2009 onwards the Swedish Transport Agency is the authority responsible for Strada.

In 2015, all but one county report to Strada on a complete basis. One remaining hospital is yet to join.

Results Data from two sources – the police and the hospitals – provides more detailed information, thus increasing the knowledge of road traffic injuries and accidents.

By accessing Strada's web-based system for extraction of information without intermediaries or by requesting information from the Swedish Transport Agency, municipalities, researchers etc. can make use of the information. In practice, Strada is capable of providing a basis for national, regional and local traffic safety efforts.

Conclusions Strada was created in close collaboration with all parties concerned. The efforts to maintain as well as develop the information system continue and from the last 15–20 years there are lessons to be learned. Lessons concerning collaboration between agencies, financing, legislative issues, software development and more.

When hospital data is included there is a decrease in the number of unrecorded cases, since the police have limited knowledge about some road traffic accidents (mainly involving unprotected road users: pedestrians, cyclists and moped drivers). In addition, the hospitals' reporting of diagnoses broadens the knowledge of the injuries and their degree of seriousness.

NOTE

1 The governmental commission was accomplished in co-operation with the Swedish Police, the Swedish National Board of Health and Welfare, the Swedish Institute for Transport and Communications Analysis, Statistics Sweden and the Swedish Association of Local Authorities and Regions.

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EPIDEMIOLOGY OF BURNS IN RURAL BANGLADESH: AN UPDATE

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Background Burns account for approximately 265,000 deaths each year with predominance in low and middle-income countries. Since most existing estimates of burn mortality and morbidity in Bangladesh have been derived from hospital records or small-scale surveys, the aim of this study was to get prevalence measures for burns and risk factors at a population level in rural Bangladesh.

Methods Census household data collected from seven rural sub-districts in Bangladesh was used to assess injury outcomes, including burns, in 2013–2014. Descriptive statistics, and univariate and multivariate analyses were conducted to determine the epidemiological characteristics and risk factors for burn injuries.

Results The overall burn mortality and morbidity rates were 2.14 deaths and 528 burn injuries per 100,000 populations. Females had a 63% (95% confidence intervals, CI: 15%–75%) higher chance of burn injuries than men across all age groups, with majority of injuries occurring inside the home. Approximately 50% of burn injuries occurred in the 25–64 year old age group. Deaths occurred mainly by flame burns (88%) where as non-fatal injuries were largely due to contact with hot liquids (56.53%), like cooking oil (21.4%). Deaths were also observed mostly in the winter season. Furthermore, children 1–4 years of age were 4.36 (95% CI: 3.37–5.63) times likelier to suffer from burn injuries than infants keeping all other factors constant. Higher level of education was seen to be associated with lower risk of burn injuries.

Conclusions Burns in rural Bangladesh are mainly seen across two extremes of ages in men and women, the propensity being higher in females. Crammed housing spaces, young age and poor educational background were found to be risk factors for burn injuries.

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SOCIOECONOMIC STATUS AND NON-FATAL INJURIES: A POPULATION-BASED MULTILEVEL ANALYSIS IN OSLO, NORWAY

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Background Research has consistently shown an inverse relationship between socioeconomic status (SES) and both fatal and non-fatal injuries (e.g., Laflamme *et al.*, 2009). Many studies using multilevel analysis assume independence between geographical areas, thus ignoring any spatial dependencies of injury rates. Likewise, studies using spatial modelling of rates will not capture the degree to which the observed rates are explained by individual (composition) and neighbourhood (context). This study aimed to examine SES by using both a multilevel and a spatial modelling approach. We examined the rates of all-cause non-fatal unintentional injuries among the adult population in 94 neighbourhoods in Oslo, Norway, adjusting for individual demographic and socioeconomic indicators.

Methods Multilevel Poisson regression models were used to analyse the relationship between neighbourhood SES and individual SES for 150 000 non-fatal injuries from hospital data from the Norwegian Patient Registry for residents in Oslo in the period 2009–2011. Additional registry information on each individual was linked using a unique personal identification number. Area-level information was linked from Statistics Norway. In addition we used geographically weighted regression (GWR) to capture the spatial heterogeneity in associations between injury and the explanatory variables.

Results Our analyses of hospital data showed strong evidence of socioeconomic differences at both individual and neighbourhood levels. However, the magnitude and direction of these differences was not uniform, but varied as a function of gender, age, activity and location at time of injury, diagnosis and severity of injury.

Conclusions These findings highlight that both contextual and compositional effects of socioeconomic status should be considered in allocating resources for injury prevention. Given the population-based nature of this study, these findings are likely to generalise to other settings.