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Mortuary based injury surveillance for low-mid income countries: process evaluation of pilot studies

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ABSTRACT

Objective: Globally, injury is the fourth major cause of death and the third leading contributor to Disability Adjusted Life Years lost due to health conditions, with the greatest burden borne by low-middle income countries (LMICs) where injury data is scarce. In the absence of effective vital registration systems, mortuaries have been shown to provide an alternative source of cause of death information for practitioners and policy makers to establish strategic injury prevention policies and programs.

This evaluation sought to assess the feasibility of implementing a standardised fatal injury data collection process to systematically collect relevant fatal injury data from mortuaries. The process evaluation is described.

Methods: A manual including a one page data collection form, coding guide, data dictionary, data entry and analysis program was developed through World Health Organization and Monash University Australia collaboration, with technical advice from an International Advisory Group. The data collection component was piloted in multiple mortuaries, in five LMICs (Egypt, India, Sri-Lanka, Tanzania and Zambia). Process evaluation was based on a questionnaire completed by each country's Principal Investigator.

Results: Questionnaires were completed for data collections in urban and rural mortuaries between September 2010 and February 2011. Of the 1795 reported fatal injury cases registered in the participating mortuaries, road traffic injury accounted for the highest proportion of cases, ranging from 22% to 87%. Other causes included burns, poisoning, drowning and falls. Positive system attributes were feasibility, acceptability, usefulness, timeliness, and simplicity and data field completeness. Some limitations included short duration of the pilot studies, limited injury data collector training and apparent underreporting of cases to the medico-legal system or mortuaries.

Conclusion: The mortuary has been shown to be a potential data source for identifying injury deaths and their circumstances and monitoring injury trends and risk factors in LMICs. However, further piloting is needed, including in rural areas and training of forensic pathologists and data-recorders to overcome some of the difficulties experienced in the pilot countries. The key to attracting ongoing funding and support from governments and donors in LMICs for fatal injury surveillance lies in further demonstrating the usefulness of collected data.

Background

Globally, injury is the fourth major cause of death and the third leading contributor to total Disability Adjusted Life Years (DALYs) lost due to health conditions. The World Health Organization (WHO) projects that in 2015, 5.2 million people will die from injury related causes, an increase from five million in 2011. Ninety percent of fatal injuries occur in Low-Mid Income Countries (LMICs) [1]. In 2012, approximately 888,013 people died as a result of injuries in Africa, which accounted for 9.6% of all deaths in the region [2].

Injury is a multifaceted issue. One major contributing factor to developing nations' inefficiency in addressing particular causes of death and injury through policy and legislative responses has been the inability to collect useful, reliable and timely data to inform prevention strategies. In most high income nations (such

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as Australia), and some middle-income countries, vital registration, using death certificates, is the usual source of injury mortality data. Only a few high income countries utilise the mortuary to provide additional detailed information to complement this information.

In response to this data gap and to address the growing burden of injury and violence related deaths in LMICs, the WHO and Monash University (Australia) collaborated to develop a practical tool for fatal injury and violence surveillance [3].

Development of the fatal-injury surveillance Manual resulted from an expressed need and interest from many countries. The Manual is tailored for those settings with limited resources but can be applied to all countries. Details of the development process are described in Grills et al. [4].

The Manual that included data collection instruments and guidelines was planned and developed through the international collaboration and an International Advisory Group [5]. It includes a one page data collection form, coding guide, data dictionary and data entry and analysis program [4]. Before its publication in 2012, the data collection process was pre-tested at the Victorian Institute of Forensic Medicine in Melbourne and piloted in mortuaries of WHO member states (Sri-Lanka, India, Tanzania, Zambia and Egypt) and a process evaluation was undertaken.

Evaluation framework

The pilot country process evaluation aimed to assess the feasibility of implementing a standardised fatal injury data collection process to systematically collect cause of death and other circumstantial and contextual information on injury-related deaths presenting to mortuaries. It was also used to assess the utility of the developed manual in: providing detailed information; identifying injury deaths, their circumstance or mechanism; and monitoring injury trends and risk factors. The premise was that by using the manual, an in-country fatal injury surveillance system would be designed in LMICs that would contribute information for use by practitioners and policy makers to establish strategic injury prevention policies and programs.

The evaluation was conducted between September 2010 and February 2011 with the objectives to:

1. Assess the feasibility of collecting relevant fatal injury data using a standard injury surveillance process in mortuaries in LMICs.
2. Identify the strengths and weaknesses of the data collection instruments and the guidance provided in the Manual developed by the collaborating group.
3. Examine the operational attributes of implementing a mortuary based injury surveillance system.
4. Enhance the data collection component of the fatal injury surveillance manual based on the findings.

Methods

Participating sites

Participating countries met inclusion criteria for the pilot and associated evaluation:

- The mortuaries admitted more than 200 injury cases annually and collected data for at least one month during the study.
- A full range of injury deaths were admitted to the mortuaries (not just legal cases such as homicides as in some countries).
- The mortuary (or mortuaries) had known catchment populations.
- The mortuaries had potential to continue the data collection following the pilot period.

Description of data collection instruments

The data instruments used in the pilot study included a data collection form (Appendix A) with an accompanying data dictionary, coding manual and a data entry and analysis program—henceforth referred to as 'instruments'. The data collection form was limited to one page for ease of completion and data entry. Importantly it was designed with cause of death fields that conformed to the International Classification of Diseases version 10 (ICD-10) also allowing for comparability across countries. The data dictionary consisted of three categories, corresponding with the form.

The first section covered the demographic characteristic of the deceased and was to be completed by the staff receiving the body in the mortuary. In three countries, the second section detailed the location, time and scene of the injury and was completed by the person bringing the body to the mortuary. Given the nature of the pilots in the other two countries, forensic pathologists, examining officers and principal investigators completed the second section of the data collection form. The last section consisted of questions to identify the cause, circumstance of death and with the possibility to identify any other factors that may have contributed to the fatal injury, completed by the forensic pathologists or the examining medical officers in all the countries.

Training and resources for pilot operation

Training for the data collection staff was undertaken by the in-country Principal Investigator (PI), a participating mortuary staff member, in each country. All PIs had some experience in injury prevention. The trainees included medical officers, nursing and allied health staff, health information officers, data clerks, analysts and researchers. The format and content of the training varied across the countries (Table 2). Each PI oversaw the operation of the pilot study and provided technical support to the data collection staff. Each pilot country hired at least two personnel who contributed to the data collection process. All five countries required a computer and printer with paper provided to the participating mortuaries. Financial support and other technical support were provided by the WHO.

Data collection and management

The evaluation was conducted in three steps. First, to set the scene for the evaluation, a web-based literature search of evaluation frameworks was conducted on Medline, Web of Knowledge and Cochrane databases with the keyword search terms' injury, fatal, mortality, mortuary, surveillance', and Mesh terms. Non-academic literature for fatal injury surveillance was also searched.

A questionnaire was developed by the evaluator and this was completed by each PI following the data collection period. The questionnaire was designed to assist in assessing the feasibility of collecting relevant fatal injury data, and specific attributes of the system, as well as the strengths and weaknesses of the data collection instruments and the mode of conduct of the study. The aggregated data was examined for its integrity as a further component of the process evaluation.

Finally, in order to elucidate the processes and the operational aspects of the pilot studies, informal discussions were held with WHO Department of Violence and Injury Prevention (VIP) staff who coordinated the pilot testing with the participating WHO member states. Additional information on: the coverage of the systems; training processes; and resources required to establish the systems was also obtained from VIP staff and the PIs in each participating country.