



Trauma registry methodology: A survey of trauma registry custodians to determine current approaches



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ABSTRACT

Introduction: The global burden of injury is enormous, especially in developing countries. Trauma systems in high-income countries have reduced mortality and disability. An important component of trauma quality improvement programmes is the trauma registry which monitors the epidemiology, processes and outcomes of trauma care. There is a severe deficit of trauma registries in developing countries and there are few resources to support the development of trauma registries. Specifically, publicly available information of trauma registry methodology in developed trauma registries is sparse. The aim of this study was to describe and compare trauma registries globally.

Methods: A survey of trauma registry custodians was conducted. Purposive sampling was used to select trauma registries following a structured review of the literature. Registries for which there were at least two included abstracts over the five-year period were defined as active and selected. Following piloting and revision, a detailed survey covering physical and human resources, administration and methodology was distributed. The survey responses were analysed; single hospital and multi-hospital registries were compared.

Results: Eighty-four registries were emailed the survey. Sixty-five trauma registries participated, giving a response rate of 77%. Of the 65 participating registries, 40 were single hospital registries and 25 were multi-hospital registries. Fifteen countries were represented; more than half of the participating registries were based in the USA. There was considerable variation in resourcing and methodology between registries. A trauma registry most commonly had at least three staff, reported to both the hospital and government, included more than 1000 cases annually, listed admission, death and transfer amongst inclusion criteria, mandated collection of more than 100 data elements, used AIS Version 2005 (2008 update) and used age, the Glasgow Coma Scale and the Injury Severity Score for injury severity adjustment.

Conclusion: Whilst some characteristics were common across many trauma registries, the resourcing and methodology varied markedly. The common features identified may serve as a guide to those looking to establish a trauma registry. However much remains to be done for trauma registries to determine the best standardised approach.

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Introduction

The global burden of injury is enormous [1]. The introduction of systems of trauma care in high-income countries has led to a

reduction in mortality and disability [2–4]. However, in low- and middle-income countries (LMICs), which suffer the greatest burden of injury, access to quality trauma care is severely limited [5,6]. To reduce this disparity, the World Health Organization (WHO) first published guidelines for implementing “essential trauma care” and subsequently published a manual specifically focusing upon trauma care quality improvement [5,6]. One of the five pillars of the United Nations’ “Global Plan” for the current “Decade of Action for Road Safety 2011–2020” is “Post crash

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response”, for which Activity 2 was “Develop hospital trauma care systems and evaluate the quality of care through the implementation of good practices on trauma care systems and quality assurance” and Activity 7 was “Encourage research and development into improving post crash response” [7]. An essential platform to enable quality improvement in trauma care systems is the trauma registry.

A trauma registry is a database which documents the epidemiology, processes and outcomes of trauma care. Trauma registries, measuring the impact of injury and quality of care, have been a key component of developed trauma systems for decades. They have been critical for driving quality improvement and demonstrating the benefits, including mortality and disability reduction, of these systems of care [2–4,8,9]. Like systems of trauma care, there is a great disparity in the number of trauma registries between developed and developing countries. Most trauma registries are based in the USA, Australia, Canada, Germany and the UK; there are far fewer trauma registries across Asia, South America and Africa [10,11].

To redress this imbalance and facilitate trauma registry development globally, there are few resources beyond the WHO guidelines [10,11]. There is no single resource available that provides comprehensive insight into the experience across trauma registries, regardless of the level of the source country's development. Although using the considerable experience of the well-established trauma registries in developed countries would be a valuable exercise for those looking to establish trauma registries in developing countries, there are currently several challenges to achieving this. Even amongst mature trauma registries, there is no clear consensus or standardisation of best methods [10,11]. Furthermore, the published details of trauma registry methodology in developed trauma registries remain incomplete. There has, to date, been little comparison and summary of trauma registry methodology from well-established trauma registries. One relatively recent study relied primarily on web-based resources with an inconsistent input from trauma registry custodians; the key foci of attention in the study were the inclusion criteria and patient-level outcomes in regional trauma registries [12]. More detailed information on registry resources, governance and data methodology, including variable selection, injury severity adjustment, missing data methods and analyses performed, would facilitate the application of optimal and standardised approaches amongst developed trauma registries and, most importantly, provide a resource for developing trauma systems to best inform trauma registry development and methodology. Such detailed information on trauma registries is not currently available.

Aim

The aim of this study was to describe and compare trauma registries globally.

Methods

Design

This was a cross-sectional observational study, using a survey of trauma registry custodians.

Population and sampling

Purposive sampling was used to select trauma registries. A structured review of the literature was performed. Relevant abstracts for the five-year period 2008–2012 were identified by searching MEDLINE database on 5 May 2013. There were no language restrictions placed on the search. Keywords employed in

the search were: “trauma registry”, “trauma registries”, “trauma database*”, “trauma databank*”, “injury registry”, “injury registries”, “injury database*”, and “injury databank*”. An additional subject heading search was performed using “Wounds and Injuries” AND “Registries”. From the results of the search, the authors included those abstracts which met all of the following criteria:

1. The trauma registry described was consistent with the broad definition of a dedicated database, prospectively collecting information regarding injured patients at a health facility;
2. The trauma registry was not limited in design to a sub-type of injury (e.g. neurotrauma, orthopaedic trauma, vascular injury or burns); and
3. The trauma registry served at least one hospital.

The source of the trauma registry described was abstracted and collated. For the purposive sampling, the registries for which there were at least two included abstracts over the five-year period were defined as *active* and selected.

Data collection

The previously described Trauma Registry Assessment Tool was used to frame the content of the survey (Supplementary File 1) [11]. Specifically, the data elements collected and analysed were:

- a. physical resources (space and equipment)
- b. human resources (staff and training)
- c. processes (administration and trauma registry methodology)

To ensure face and content validity, and inform improvements to the ease of completion, the survey was piloted electronically (Survey Monkey®) in August 2013 through its completion by the custodians of six trauma registries, representing single hospital and regional, adult and paediatric registries. The content and format of the survey was revised accordingly.

Ethics approval

Ethics approval was obtained and then in February 2014 the survey, with consent form, was distributed using an electronic format (Survey Monkey®). Following the provision of consent, participants proceeded to complete the survey. Three reminder distributions were conducted prior to completion of the survey period in April 2014. Email follow-up occurred where necessary to clarify responses to specific questions.

Analysis

Survey responses were collected and the data analysed according to the afore-mentioned taxonomy (Trauma Registry Assessment Tool) [11]. For selected domains, registry features were compared across their own level of jurisdiction (single hospital or multi-hospital registry). Consistencies and differences were summarised in the text.

Results

The search strategy returned 1220 articles. Application of the pre-defined inclusion criteria led to the identification of 867 abstracts from 305 trauma registries. 106 registries had two or more publications in the targeted five-year period and were selected for consideration for the study sample of *active* trauma registries, pending confirmation of contact details. Contact details were confirmed for 84 of the *active* trauma registries, all of whom

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