



Global trauma registry mapping: A scoping review

Gerard M O'Reilly^{a,b,*}, Peter A Cameron^{a,b}, Manjul Joshipura^c

^a Emergency and Trauma Centre, The Alfred, Commercial Rd, Melbourne, Victoria 3004, Australia

^b Victorian State Trauma Registry, Department of Epidemiology and Preventive Medicine, School of Public Health and Preventive Medicine, Monash University, Commercial Rd, Melbourne 3004, Australia

^c Department of Violence & Injury Prevention & Disability (VIP), World Health Organization, 20 Avenue Appia, Geneva 27 CH-1211, Switzerland

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ABSTRACT

Background: The burden of injury is very high in developing countries. Trauma systems reduce mortality; the trauma registry is a key driver of improvements in trauma care. Developing countries have begun to develop trauma systems but the level of local trauma registry activity is unclear. The aim of this study was to determine a global estimate of trauma registry activity.

Methods: A structured review of the literature was performed. All abstracts referring to a trauma registry over a two-year period were included. For the trauma registry described in each abstract, the source country was recorded. An additional search of web pages posted over a one year period was conducted. Those linked to an active trauma registry website were included and the country of the trauma registry was recorded. A selection of trauma registries from countries of different levels of development were identified and compared.

Results: 571 abstracts were included in the review. Most articles utilised “general” trauma registries (436(76%)) and were based at a single hospital (279(49%)). Other registries were limited to military or paediatric populations (36(6%) and 35(6%) articles respectively). Most articles sourced registries from the US (288(50%)), followed by Australia (45(8%)), Germany (32(6%)), Canada (27(5%)), UK (13(2%)), China (13(2%)) and Israel (12(2%)). The Americas produced most trauma registry articles and South East Asia the least. The majority of trauma registry articles originated from very highly developed countries 467(82%). Least developed countries had the fewest (5(1%)). The additional search yielded 37 web pages linked to 27 different trauma registry websites. Most of these were based in the US (16(59%)). The basic features of trauma registries, such as inclusion criteria, number and type of variables and injury severity scoring, varied widely depending on the country's level of development.

Conclusion: This review, using a combination of the number of trauma registry articles and web pages to locate active trauma registries, demonstrated the disparity in trauma registry activity between the most and least developed countries. The absence of trauma care information systems remains a challenge to trauma system development globally.

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Introduction

Injury is a major global public health problem.^{1–5} Each year, 5.8 million people die from injury, and many more are disabled. It is the leading cause of death of men and women under the age of 45, and is responsible for more productive years of life lost than heart disease and cancer combined. The burden is especially high in low- and middle-income countries (LMICs) where more than 90% of the world's deaths from injuries occur.^{1–5}

In 2004, the World Health Organization (WHO) published Guidelines for Essential Trauma Care, seeking to “reduce disparities in injury outcome between LMICs and high-income countries (HICs) by establishing achievable and affordable standards for injury care worldwide”.² Many HICs have significantly lowered trauma mortality rates by improving the organisation of, and planning for, trauma care through the implementation of trauma systems that address all aspects of care – from the prehospital setting, to initial resuscitation in the hospital, to longer term definitive care.^{6–14} In Australia, for example, Cameron et al. demonstrated that the introduction of a statewide trauma system was associated with a significant reduction in risk-adjusted mortality.⁶ Comparing countries with and without trauma systems, Mock et al. showed that people with life-threatening but potentially treatable injuries are up to six times more likely to die in a country with no organised trauma system than in one with

* Corresponding author at: Emergency and Trauma Centre, The Alfred, Commercial Rd, Melbourne, Victoria 3004, Australia. Tel.: +61 0438 338 414.

E-mail addresses: oreillygerard@hotmail.com, gerard.oreilly@monash.edu (G.M. O'Reilly).

an organised, resourced trauma system.⁷ Such inclusive systems of trauma care should be regarded as a minimum standard for health jurisdictions. But trauma system development remains basic in many LMICs.

In 2009, to further strengthen the quality of trauma care globally, the WHO published Guidelines for Trauma Quality Improvement Programmes.¹ The efficiency of Trauma Quality Improvement (TQI) activities is optimal where there is access to a trauma registry collecting trauma-specific data.¹ A trauma registry is broadly defined as a dedicated data repository for trauma patients.¹ In one of the few reviews conducted on the topic, Moore and Clark further defined trauma registries as “databases that document acute care delivered to patients hospitalised with injuries...designed to provide information that can be used to improve the efficiency and quality of trauma care”.¹⁵ Specifically, trauma registries are used to describe injury epidemiology, track quality indicators, benchmark trauma care and advocate injury prevention policy; they are integral to trauma quality improvement programmes (TQIPs).^{1,15,16}

Trauma registries have been in existence for more than three decades in HICs allowing local, national and international benchmarking and performance improvement.^{15,17–19} They are now considered to be an essential component of mature trauma systems.^{15,17–19} Whilst many LMICs have recognised the need for trauma system development, including the establishment of trauma registries to monitor these systems, their existence in LMICs remains sporadic at best, and to date, there has been no published account of where trauma registries exist.^{1,2,15}

The primary objective of this review was to determine the current distribution of active trauma registries, globally, using published literature and publicly available resources. A secondary objective was to identify a selection of established trauma registries and provide a preliminary comparison of registry methodology between developed and developing trauma systems.

Materials and methods

A structured literature review was performed. Relevant abstracts were identified by searching the following databases on 25 January, 2011: Medline, EMBASE and CINAHL. Searches were restricted to the two year period from 1 January 2009 to 31 December 2010. The period of two years was chosen to represent current registry activity through publication in the medical literature. There were no language restrictions. Key words 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 in Medline using “Wounds and Injuries” AND “Registries”, in EMBASE using “Disease Registry” AND “Injury”, and in CINAHL using “Registries, Trauma”.

From the results of the abstract search, the authors selected those abstracts which contained one of the key words, which in turn were consistent with the broad definition of a trauma registry used by Moore. That is, for the purposes of abstract selection, a trauma registry was defined as a dedicated database collecting information regarding the care provided to injured patients at a health facility. Abstracts referring to a trauma registry providing care for a sub-type of injury (e.g. neuro-trauma, orthopaedic trauma, burns, paediatric trauma) were also included.

The following questions were applied to the selected articles:

1. Where was the trauma registry located (one or more countries)?
2. At what health service level (hospital, city, region, national, international) was the trauma registry's jurisdiction?

The countries listed in the answer to the first question were subsequently categorised by:

1. Geography, using the WHO Classification of Regions,²⁰ and
2. Level of development, using the United Nations Development Index (UNDI).²¹

There are a number of methods to compare the development level of the country. The UNDI was chosen as the tool for this review because it provides an holistic measure of “human development” including national income per capita, life expectancy and educational standards.²¹

An additional search of pages posted on the internet was conducted on 10 February 2011, using the Advanced Search capability of <http://www.google.com>. The search period was restricted to the previous one year. There were no language restrictions. Search terms employed, to be found in the title of the webpage, were: “trauma registry”, “trauma database” and “trauma databank”. The search was conducted with the “any region” option. From the results of the web page search, the authors selected those web page postings which were linked to the website of a trauma registry, consistent with the broad definition used by Moore.¹⁵ The question applied to the trauma registry website search results was: “Where was the trauma registry located (country)?”

Finally, to identify, describe and compare trauma registries, the results of the literature review were examined in more detail. Established trauma registries, with the greatest number of publications, were identified and data collected on specific location, contact options and web-based sources for more information. In the relative absence of established websites, details of trauma registries based in developing countries were necessarily derived from a different source. Articles about a developing country trauma registry were firstly identified. Of these articles, a sample was chosen based on the level of detail regarding trauma registry methodology. The key described features of these trauma registries were compared with the features of a sample of well-established counterparts.

Results

The literature search identified 640 abstracts of which 571 referred to a trauma registry (see [Supplementary File 1](#)).

The sub-type of trauma registry was identifiable in 552 articles and is described in [Table 1](#). Most of the articles (436(76%)) described trauma registries which were inclusive of “general” trauma patients regardless of mechanism, type of injury or age. After these, the registries most frequently described in publications were limited to military (36(6%)) or paediatric (35(6%)) populations. The most commonly referenced military trauma registry was the Joint Theatre Trauma Registry, a US combat registry of Iraq and Afghanistan.

Table 1
Number of trauma registry publications by trauma registry sub-type.

Injury-subtype	Publications (%)
Trauma	436(76)
Military	36(6)
Paediatric	35(6)
Spine	9(2)
Orthopaedic	7(1)
Brain	7(1)
Other	22(4)
Review	17(3)
Missing	2(0)
Total	571

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