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Review Paper

The changing health priorities of earthquake response and implications for preparedness: a scoping review

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ABSTRACT

Objectives: Earthquakes have substantial impacts on mortality in low- and middle-income countries (LMIC). The academic evidence base to support Disaster Risk Reduction activities in LMIC settings is, however, limited. We sought to address this gap by identifying the health and healthcare impacts of earthquakes in LMICs and to identify the implications of these findings for future earthquake preparedness.

Study design: Scoping review.

Methods: A scoping review was undertaken with systematic searches of indexed databases to identify relevant literature. Key study details, findings, recommendations or lessons learnt were extracted and analysed across individual earthquake events. Findings were categorised by time frame relative to earthquakes and linked to the disaster preparedness cycle, enabling a profile of health and healthcare impacts and implications for future preparedness to be established.

Results: Health services need to prepare for changing health priorities with a shift from initial treatment of earthquake-related injuries to more general health needs occurring within the first few weeks. Preparedness is required to address mental health and rehabilitation needs in the medium to longer term. Inequalities of the impact of earthquakes on health were noted in particular for women, children, the elderly, disabled and rural communities. The need to maintain access to essential services such as reproductive health and preventative health services were identified. Key preparedness actions include identification of appropriate leaders, planning and training of staff. Testing of plans was advocated within the literature with evidence that this is possible in LMIC settings.

Conclusions: Whilst there are a range of health and healthcare impacts of earthquakes, common themes emerged in different settings and from different earthquake events. Preparedness of healthcare systems is essential and possible, in order to mitigate the adverse health impacts of earthquakes in LMIC settings. Preparedness is needed at the community, organisational and system levels.

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Introduction

Earthquakes are estimated to account for 36% of all global annual losses from natural hazards, equivalent to US $113 billion.[1] Between 1980 and 2009, 61 million people were affected by earthquakes with approximately 373,000 killed and 995,000 injured.[2]

Impacts are particularly felt in low- and middle-income countries (LMICs). The consequences of earthquakes on resource-constrained countries with limited health services have been clearly demonstrated by the massive death tolls of recent earthquakes in Pakistan (2005),[3] Haiti (2010)[4] and Nepal (2015)[5] (87,000, 160,000 and 9000 deaths respectively). Indeed, between 1990 and 2013, 85% of all earthquake mortality occurred in LMICs.[1]

The Sendai Framework for Disaster Risk Reduction[6] emphasises the importance of understanding the 'disaster risk' or potential health and healthcare impacts of hazards in order to be better prepared and thus mitigate impacts of any disaster. Disaster preparedness is a key priority area for action within the framework. However, the evidence base to support this is often from a humanitarian perspective, of a generic nature encompassing all disasters or all settings, or narrowly focussed on very specific areas of health impact.

Thus far, reviews have been carried out identifying immediate postearthquake priorities in any country regardless of income status,[2] of public health interventions in a humanitarian crisis,[7] of operational humanitarian agencies in a postearthquake low income country,[8] of acute medical complications associated with earthquakes,[9] of medical rehabilitation after natural disasters[10] and of health effects associated with relocation after disasters.[11] Many are confined to a specific geographic area[12,13] whilst others have cited the lack of available good quality evidence,[10,11] a common problem encountered in disaster management research.[14–17]

Effective disaster preparedness and response are essential for mitigating the impacts of a disaster.[18] This relies on the availability of information and evidence to inform responders of the expected or actual impact. However, the consequences of disasters can vary significantly from country to country. This is in part likely to be influenced by the degree of resource constraints and type of disasters affecting a country. A better understanding of the anticipated health consequences of a disaster is essential to help inform disaster planning and response. To our knowledge there has been no comprehensive review of the health impacts of earthquakes in LMIC settings. Our scoping review seeks to address this issue and identify possible mitigating factors to guide future earthquake preparedness and response.

Methods

Scoping review

A scoping review was carried out using the framework developed by Arksey and O'Malley.[19] This uses a systematic search methodology whilst allowing for the review of a broader, less restrictive, range of evidence. We anticipated that most of the evidence was likely to be short reports.[14–17] Consequently, we intentionally adopted a more inclusive approach to include papers that might have been excluded in a more rigid systematic review format as we wanted to capture the full range of health impacts associated with this type of disaster. Inclusion criteria were developed and tested prior to screening. We included articles relating to earthquakes from countries within the World Bank criteria for low and lower middle-income countries;[20] published from 1st January 1990 onwards to coincide with the International Decade for Natural Disaster Reduction;[21] published in English; with a primary focus on earthquakes and health and/or health care. Search strings were developed as detailed in Fig. 1.

Exclusion criteria were developed following an initial review of the literature, prior to screening by title and abstract. Articles were excluded where earthquakes were not the main disaster type under consideration, where the primary concern was international personnel, or where they were reporting the viability or suitability of different patient procedures or medical trials.

Searches were undertaken between 22nd March and 5th April 2016. Indexed databases searched included: CINHAL; EMBASE; Medline; PsycINFO; Scopus; Web of Science (Core Collection); ProQuest (ASSIA; PILOTS; International Bibliography of Social Sciences; Dissertations and Theses UK & Ireland; Dissertations and Theses A & I; Health and Safety Science Abstracts; COS Conference Papers).

Search results were screened initially by title and abstract, by a single reviewer. Where no abstract was available the record was included for full text review. Full text review was undertaken independently by two reviewers. Consensus was reached through discussion where disagreements occurred. Records which had neither full text nor abstract available were discounted; those with just abstract or conference poster presentation were included.

From the included studies, data were extracted on the time period covered by the study, study type, key findings and key recommendations or lessons learnt. All data were recorded in an Excel database. We analysed the findings, key recommendations or lessons learnt from each earthquake event and descriptively coded. These codes were then organised by themes (physical health, mental health and health care) and categorised chronologically by: preparedness (predisaster), 0–2 weeks, 2 weeks–6 months and beyond 6 months postdisaster. We also used the internationally recognised four-stage disaster cycle (mitigation, preparedness, response and recovery) as the conceptual framework to help organise the codes. Summaries were then produced for each earthquake disaster, compared with each other and consolidated into this review. Extraction and coding were undertaken independently by two reviewers with findings collated and emergent themes identified through discussion. Discrepancies were resolved by discussion.

Findings

Study identification and selection

The literature search yielded 5831 unique records. After removing duplicates, 1595 were screened by title and abstract.