



This is a repository copy of *The changing health priorities of earthquake response and implications for preparedness: a scoping review.*

White Rose Research Online URL for this paper:
<http://eprints.whiterose.ac.uk/119314/>

Version: Accepted Version

Article:

Cartwright, C., Hall, M. and Lee, A.C.K. orcid.org/0000-0002-9795-3793 (2017) The changing health priorities of earthquake response and implications for preparedness: a scoping review. *Public Health*, 150. pp. 60-70. ISSN 0033-3506

<https://doi.org/10.1016/j.puhe.2017.04.024>

Article available under the terms of the CC-BY-NC-ND licence
(<https://creativecommons.org/licenses/by-nc-nd/4.0/>).

Reuse

This article is distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs (CC BY-NC-ND) licence. This licence only allows you to download this work and share it with others as long as you credit the authors, but you can't change the article in any way or use it commercially. More information and the full terms of the licence here: <https://creativecommons.org/licenses/>

Takedown

If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing eprints@whiterose.ac.uk including the URL of the record and the reason for the withdrawal request.



eprints@whiterose.ac.uk
<https://eprints.whiterose.ac.uk/>

The Changing Health Priorities of Earthquake Response and Implications for Preparedness: A Scoping Review

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 learned were extracted and analysed across individual earthquake events. Findings were categorised by timeframe 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 including identification of appropriate leaders, planning, training of staff. Testing of plans were 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.

Key words: Earthquake, Disaster, Resilience, Preparedness, Health

Introduction

Earthquakes are estimated to account for 36% of all global annual losses from natural hazards, equivalent to US \$113 billion¹. Between 1980-2009 61 million people were affected by earthquakes with approximately 373,000 killed and 995,000 injured².

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 (87000, 160000 and 9000 deaths respectively). Indeed, between 1990 and 2013, 85% of all earthquake mortality occurred in LMICs¹.

The Sendai Framework for Disaster Risk Reduction⁶ 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 post-earthquake priorities in any country regardless of income status², of public health interventions in a humanitarian crisis⁷, of operational humanitarian agencies in a post-earthquake low income country⁸, of acute medical complications associated with earthquakes⁹, of medical rehabilitation after natural disasters¹⁰, and of health effects associated with relocation after disasters¹¹. 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 research¹⁴⁻¹⁷.

Effective disaster preparedness and response are essential for mitigating the impacts of a disaster¹⁸. 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 reports¹⁴⁻¹⁷. 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 countries²⁰; published from 1st January 1990 onwards to coincide with the International Decade for Natural Disaster Reduction²¹; published in English; with a primary focus on earthquakes and health and/or healthcare. Search strings were developed as detailed in Figure 1.

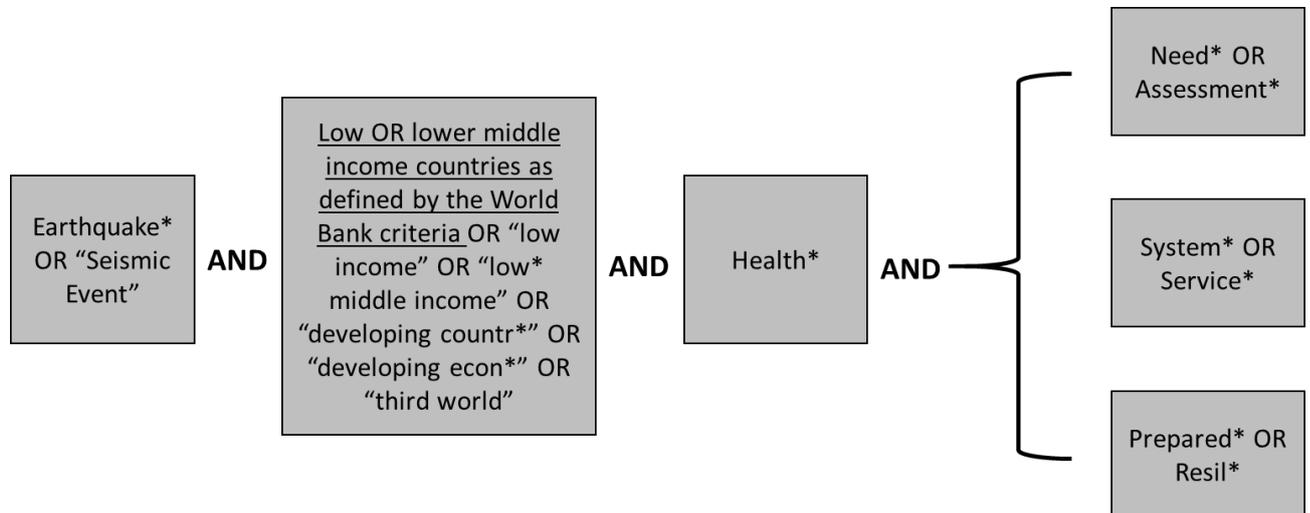


Figure 1 – Search Strings

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 & Eire; 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 was extracted on the time period covered by the study, study type, key findings, and key recommendations or lessons learned. All data was recorded in an Excel database. We analysed the findings, key recommendations or lessons learned from each earthquake event and descriptively coded. These codes were then organised by themes (physical health, mental health and healthcare) and categorised chronologically: preparedness (pre-disaster), 0-2 weeks, 2weeks - 6 months, and beyond 6 months post disaster. We also used the internationally-recognized 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. Of these, 476 were selected for full text review for relevance. 152 were included in the final review as illustrated in Figure 2.

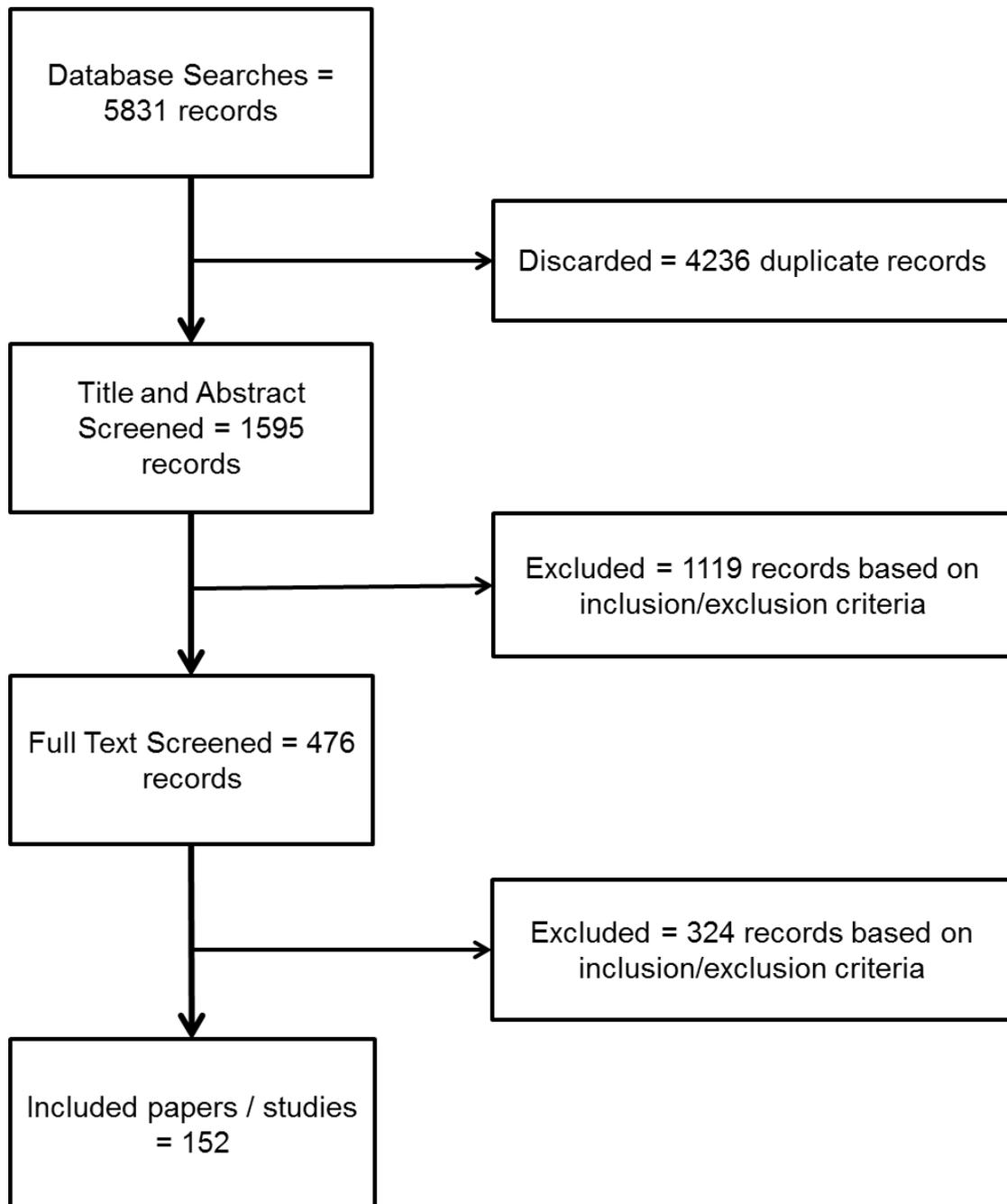


Figure 2: Papers included

Study Characteristics

Table 1 details the distribution of studies by study design. 73% of all the studies were classed as “other”. They largely consisted of personal accounts and reports from the field. Cross-sectional studies accounted for 17% of total studies.

Table 1: Breakdown of study characteristics

Study Design	Number of Studies
Cross Sectional	26
Cohort	1
Ecological	4
Mixed Methods	6
Qualitative	2
Case Control	2
Other	111
TOTAL	152

The Haiti earthquake accounted for 51% of all reports, whilst the Kashmir earthquake (India and Pakistan) accounted for 27%. 63% of all studies covered the initial post-disaster period up to six months. Of the 135 studies reporting health issues (Table 2), over 63% (n=85) reported findings predominantly concerning physical health, 24% (n=32) on mental health and 13% (n=18) on healthcare issues.

Thematic analysis

In the first two weeks there is a predominance of earthquake related injuries and consequent healthcare service demand. After these first few weeks a shift occurs to more routine population health needs emerging alongside ongoing care for those with earthquake related injuries. In the longer term, the health needs centred around rehabilitation, mental health and chronic health conditions (Figure 3).

Table 2: Distribution of studies by time frame and major health theme

Event	Total Number of Papers	Distribution of studies across time from earthquake occurrence					Distribution of studies across major themes#		
		Not defined	Pre-event	0 to 2 weeks	2 weeks to 6 months	6 months onwards	Physical Health	Mental Health	Health care
Armenia 1988*	10	-	-	2	2	9	3	7	1
Columbia 1999	1	-	-	1	1	-	1	1	1
El Salvador 2001	3	-	-	-	-	3	1	1	-
Haiti 2010	78	12	7	42	40	18	40	8	20
India (no date)~	1	-	1	-	-	-	-	-	1
India 1993	2	1	-	-	1	-	-	1	1
India 2001*	5	1	-	4	3	2	5	-	1
India 2005 (Kashmir)	4	-	-	1	2	1	3	1	1
Indonesia 2005	1	-	-	1	1	-	-	-	1
Indonesia 2006	4	1	1	1	1	3	1	2	1
Indonesia 2009	5	-	2	1	3	3	4	-	1
Nepal (no date)~	1	-	-	1	1	-	1	-	-
Nepal 1988	1	-	-	1	1	-	1	-	-
Nepal 2015*	4	1	1	1	2	-	1	2	1
Pakistan (Kashmir) 2005	38	7		17	18	12	24	9	8
TOTAL	154	23	12	73	76	51	85	32	18

Note: * 1 paper covered events in Armenia 1988, India 2001 and Nepal 2015 and is therefore counted three times; ~ refers to preparedness papers therefore not attributed to a specific earthquake event; # the total across major themes is lower than the total number of papers as some papers were general commentary or opinion pieces containing insufficient information to be categorised.

Earthquake related injury

Trauma injuries, particularly to extremities such as arms and legs²²⁻²⁹, dominated reports in the first two weeks following an earthquake. Wound debridement^{22, 24, 30-32} comprised a large proportion of procedures undertaken, with general wound infections^{30, 33-35}, some specifically related to tetanus^{36, 37}, requiring management and ongoing care for up to 8 months²⁶. Late presentations of earthquake related injuries were often for complications associated with infections due to the lack of treatment^{33, 38}.

Relative to total injuries and presentations, the numbers of spinal cord injuries^{24, 39, 40} and amputations^{22, 27, 37, 41, 42} reported were low. The medical capacity and expertise to manage such cases was however, often limited and positive outcomes were not assured³ with one study reporting mortality as the most likely outcome for quadraplegics⁴³. Countries had to develop rehabilitation services^{39, 44-47} to deliver rehabilitation over the long term^{3, 43, 47}.

Issues associated with the quality of care in the initial response were frequently reported. There were infection prevention and control^{29, 48, 49} concerns raised as the environment in which healthcare was delivered was often compromised. There was also often a lack of appropriate separation of adult and paediatric patients³⁵. The absence of agreed triage protocols led to inconsistent approaches and ethical dilemmas for staff⁵⁰ regarding who to treat and when. In some instances prioritisation was by patient need^{37, 51, 52}, yet in others through a combination of patient need and the need to make the best use of available resources^{40, 50}.

The lack of appropriately trained and skilled staff created problems^{29, 40, 44, 53} particularly for certain injury types. Inappropriate pre-hospital⁴⁷ and hospital care of spinal cord injury patients led to the development of pressure sores^{39, 54} and urinary tract infections^{44, 54} whilst the use of interventions inappropriate to the resource setting by some newly arriving international specialist staff led to unnecessary post-operative complications^{26, 29}. International staff tended to depart after the initial response leading to difficulties in providing ongoing post-operative care for patients they had treated^{26, 55}.

Changing health priorities

After the initial post-earthquake period, health needs changed from earthquake-related ailments to more routine presentations^{35, 41, 56-59}. More infections were seen, in part attributed to living conditions, including respiratory infections^{33, 56, 59-61}, gastrointestinal illnesses^{56, 59, 62-65}, skin conditions^{56, 59, 61, 64}, ocular infections⁵⁹ and urinary tract infections^{56, 59}. The need for continued delivery of primary healthcare to meet these health needs was repeatedly emphasised^{56, 65, 66}. The importance of surveillance systems to identify infectious disease threats were identified⁶⁷⁻⁶⁹ as was the requirement to ensure safe water supplies in order to prevent further infections^{4, 70}. Increases in mortality and morbidity from non-communicable chronic diseases were initially reported amongst earthquake survivors⁷¹. The need for appropriate management of these chronic diseases^{63, 65}, including the ongoing provision of antiretroviral therapy^{72, 73}, was highlighted.

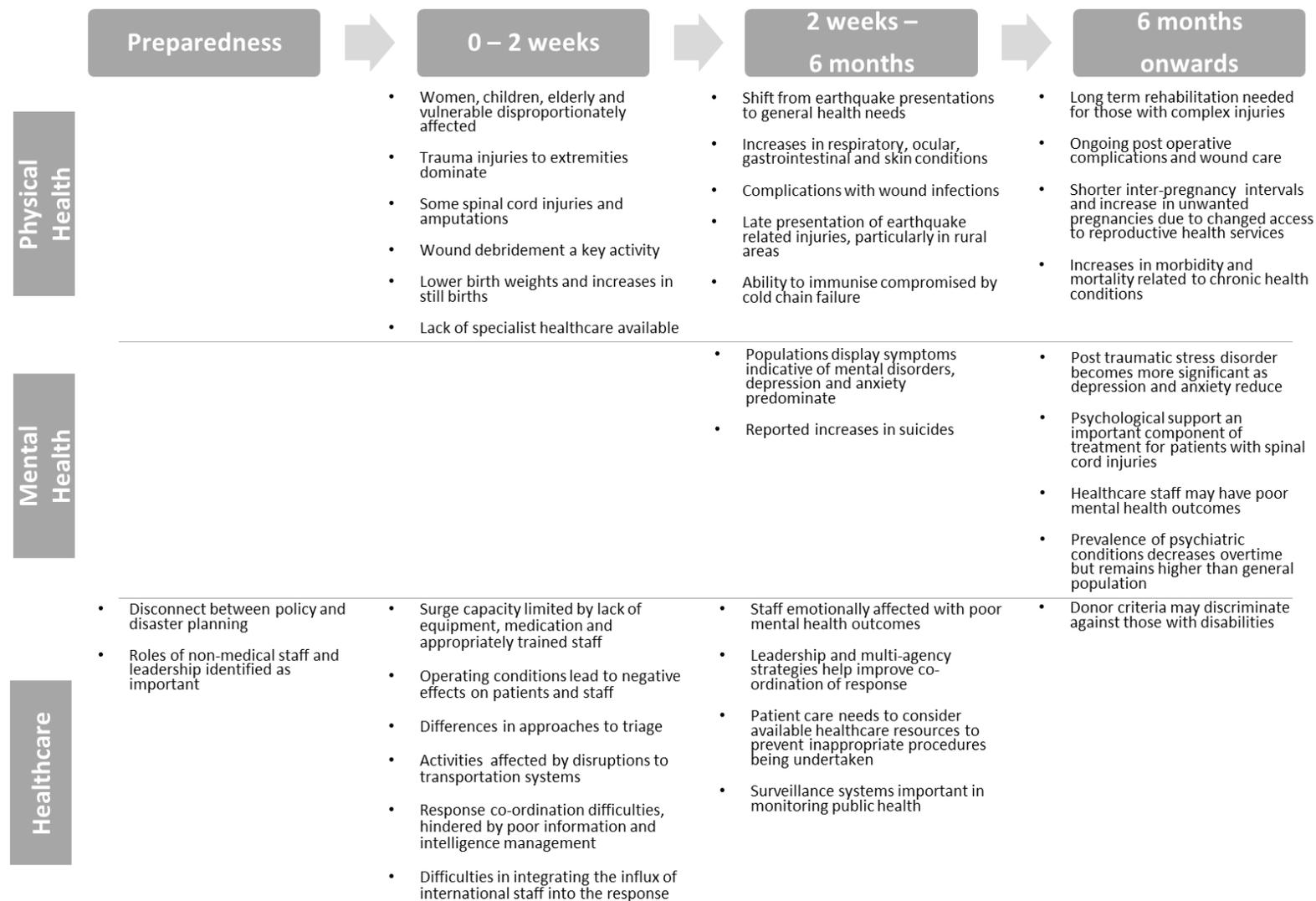


Figure 3 – Summary of Key Findings

Mental health

Mental health issues increased in prominence following the immediate post-earthquake period⁷⁴⁻⁷⁷. Initially, depression and anxiety were predominant⁷⁸⁻⁸⁰. However, over time these declined but post-traumatic stress disorder became an increasing issue after the first six months^{80, 81}. One study from Nepal reported a 43% increase in recorded suicides in the three months following the earthquake⁸². Longer term studies from Armenia, up to 23 years later, demonstrated a higher prevalence of psychiatric conditions in those exposed to the earthquake compared to those not exposed⁸³ with conditions such as psychosis and obsessive compulsive disorder being more prevalent⁸⁴. The importance of other services that impact on mental health were also recognised including the value of early re-establishment of education⁶² and social networks^{81, 85}. The importance of education is highlighted particularly for women and children, with both vulnerable groups often overlooked in the disaster response⁸⁶⁻⁸⁸.

Reproductive health

The immediate impacts reported on reproductive health included lower birth weights^{89, 90} and higher proportions of still births⁹⁰. In the medium term, reproductive outcomes continued to be affected with shorter inter-pregnancy intervals⁸⁹, increases in unplanned pregnancies^{89, 91} and an overall increase in births⁹². Also reported were reductions in access to reproductive health services as a consequence of the earthquake^{91, 93-95}.

Inequality of impact

Earthquake impacts were not equal. Women, children⁹⁶ and the elderly were identified as being more likely to have died at the time of the earthquake⁹⁷. Women^{27, 38, 39, 47, 59, 67, 98-102}, children³⁸, elderly³⁸ and those with disabilities¹⁰³ were also reported as being disproportionately affected both with regard to earthquake-related injuries as well as other more routine health presentations. This occasionally extended to access to donor support with one study reporting that people with certain disabilities were unable to access some services due to external donor criteria restrictions¹⁰³. Women^{85, 104-106}, the elderly⁸¹ and those with a history of exposure to violent events⁸⁰ were also reported to be at increased risk of adverse mental health outcomes.

The needs of those outside of official response arrangements, such as those in unofficial displaced persons camps, were also higher due to a lack of comparable health services^{63, 107}. More broadly, inequalities between urban and rural populations were also observed with timely care often lacking for the most vulnerable in rural areas^{108, 109}.

Coordination response and logistics

Co-ordination difficulties in the response phase were frequently reported both within and between healthcare services^{41, 43, 55, 103, 107, 110}. These difficulties were exacerbated by poor information and intelligence management^{35, 51, 103}. As the initial response developed, co-ordination improved^{99, 111} with the development of single healthcare response arrangements^{35, 51, 64} with master health facilities lists¹¹¹ being identified as useful co-ordination tools. Logistical difficulties due to travel disruption hindered the ability to deliver care^{25, 46, 108, 112} and transport patients^{29, 47}. Patients travelled to functioning healthcare facilities on the periphery of areas most impacted by earthquakes, increasing demands on these services^{42, 113}, with some patients travelling great distances to access treatment^{61, 113}. The ability to respond immediately following an earthquake, through the provision of surge capacity, was often limited by the availability of physical resources^{25, 35, 40, 51, 100, 108} including access to both medications^{25, 48, 114, 115} and medical equipment^{25, 44, 48, 49, 114}.

Healthcare systems and staff

Policies requiring the development of health service disaster planning were often not implemented at a local level leading to a preparedness gap¹¹⁶. Consequently, in some of the earthquake disasters, health systems experienced multiple disruptions such as cold chain failure that compromised preventative healthcare including tetanus immunisations⁴⁰. Donations of medication and medical equipment were often inappropriate^{64, 117, 118}, despite international guidelines being in place to avoid such situations.

As reported earlier, the lack of appropriately trained and skilled staff in the initial response^{40, 44, 53, 118} had negative effects on the quality of care. Specialist staff required included specialist paediatric staff^{62, 119}, trained non-medical support and administrative staff⁹⁰, physical and occupational therapists^{40, 46, 118, 120}, multi-disciplinary teams^{51, 99}, medicines management staff and logistics specialists^{118, 120}. Rehabilitation staff were also considered to play an important role in facilitating patient discharge⁵. The means to care and support staff were also highlighted as important with reports of staff being negatively affected through both the earthquake and their work in responding to it^{53, 75, 76, 115, 121, 122}.

The importance of the role of non-medical staff and non-clinical leadership in co-ordinating and facilitating the disaster response was also highlighted¹²³. In addition it was also reported that staff may themselves be emotionally affected by their own personal earthquake experiences^{75, 115} and feel ill prepared to respond to patient needs⁵³. Indeed, some healthcare staff were reported to have poor mental health outcomes afterwards^{76, 122}, particularly those working in public sector healthcare settings¹²¹.

Discussion

Implications for Preparedness

This review highlights the common health impacts that occur following an earthquake in a LMIC¹⁶. The findings have important implications for earthquake preparedness at the community, organisational and national levels. Indeed, a large proportion of the reviewed literature recognised the need for pre-planning, preparedness, training and exercising prior to an earthquake. Our chronological thematic analysis naturally aligns to the Disaster Preparedness Cycle (Figure 4) and it is useful to discuss these findings and their implications on preparedness in relation to this cycle. Where applicable these have been linked to existing components of the World Health Organisation toolkit for assessing health system capacity for disasters¹²⁴.

Systems approach to preparedness

The preparedness cycle applies to all levels of response from community to international. However, in LMICs a disconnect between policy and practice often exists¹²⁵ and may manifest through the lack of co-ordinated response planning, organising, exercising and reviewing of disaster response by the different levels of the system. Whether a lack of anticipation of common injury types, the shift from immediate to routine health needs or the need for long term, ongoing mental health support, a system wide, multi-level approach as advocated by WHO¹²⁴, would go some way to enhancing preparedness and thus response to earthquakes.

In addition, disaster preparedness requires effective leadership and management. Leadership does not always mean medical leadership: several studies identified by our review specifically highlight

the need for leadership not to be solely centred within the medical response¹²³. Leadership and governance have been highlighted as one of the six key functions by the WHO¹²⁴ and identifying suitable situational leadership *at all levels* forms a central part of a systematic approach to disaster preparedness.

Need for systematic planning

Meticulous planning forms the bedrock of the disaster cycle. If planning is poor, unsystematic or only at a single level, then it is likely that all other aspects of the cycle will also fail. Our review has identified a number of common themes that are important to consider at the planning stage of disaster preparedness. These include identifying the population's pre-existing health needs, the availability and distribution of staff (including specialist, international, and non-health staff), surge planning and changing health priorities. Systematic planning allows for the multi-level systematic identification of areas of need and gaps in service provision or potential vulnerabilities that require particular input or preparation⁸⁶. We would advocate the use of our summary of key themes (Figure 3) alongside the WHO healthcare assessment toolkit¹²⁴ to support this planning process. Other issues, such as that of inappropriate medicine donations are also covered by existing WHO guidelines¹²⁶ and are important considerations of the planning process.

Importance of developing system capacity and capabilities

As observed, one common vulnerability identified was the lack of disaster management training for staff^{34, 47, 53, 66, 78, 115}. Our review also highlighted a lack of disaster exercise or testing of plans. All elements of preparedness need validating through emergency exercises^{34, 47, 49, 64, 123, 127} which can in turn help inform and refine the development of future response arrangements. Experience from Nepal¹²³ demonstrates that it is possible to conduct such exercises in low resource settings and additionally illustrates the value of identifying previously unanticipated issues.

Disaster preparedness at the Community, Agency and System Levels

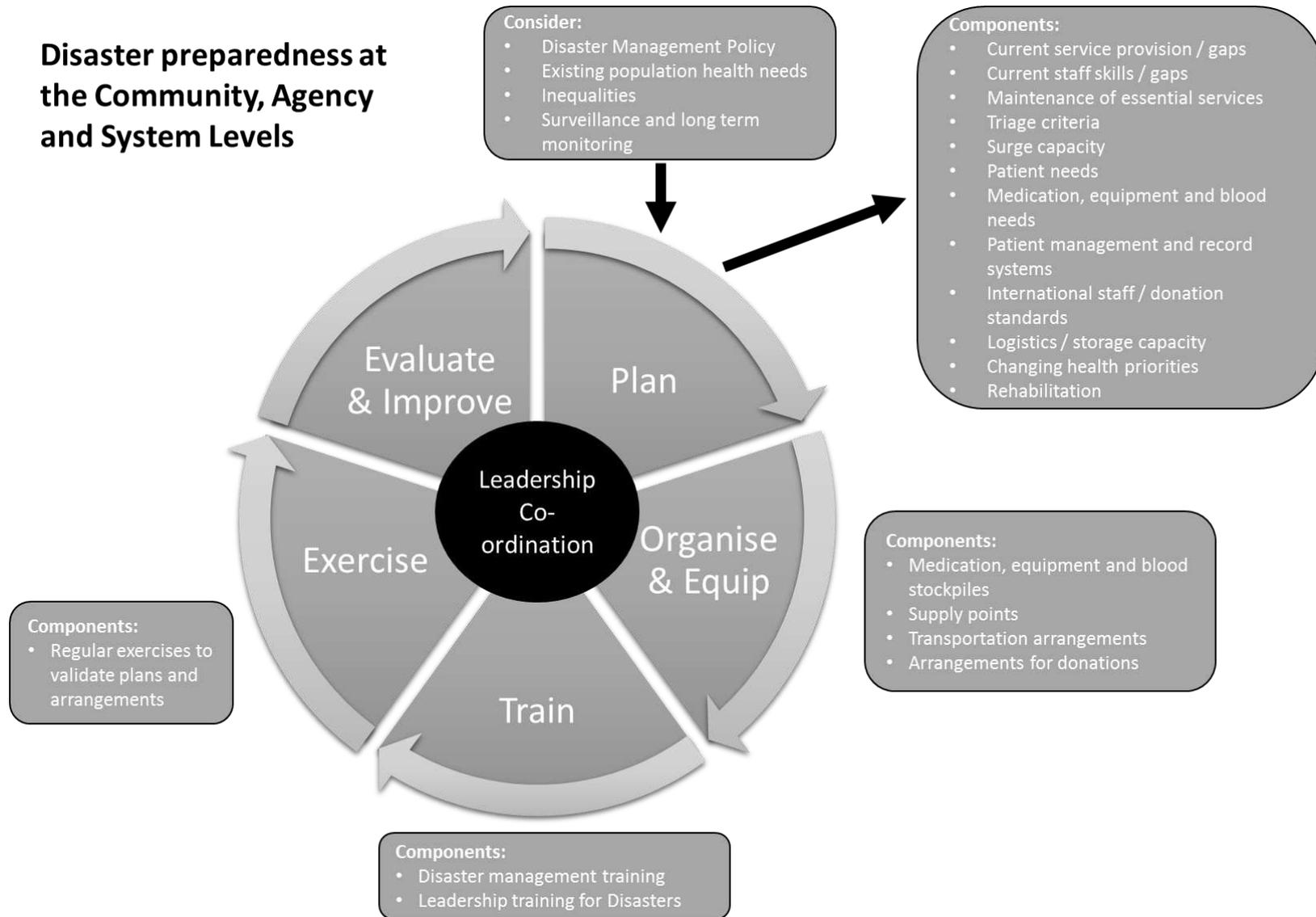


Figure 4 – Implications for Preparedness

Implications for research

While international declarations, frameworks and policies to strengthen disaster preparedness in health systems have been in place for a number of years¹²⁴ it is clear from the evidence considered in this review and wider assessments⁸⁷ that there remains much to do. The lower quality of studies within this field have previously been reported¹⁶ and our review has identified similar issues. While standards for reporting have been suggested¹⁴ there are no universally agreed quality frameworks to assess such literature. The development of such frameworks would allow a more considered review of the evidence base in the future.

Limitations

One acknowledged limitation of this review is that we only searched for papers in English or that had English translations accompanying them as was the case of several papers from Pakistan. In doing so it is possible some relevant publications may have been excluded. However, the review did use a broad inclusive approach to sampling and through the large number of papers identified it is likely that most if not all emergent insights will have been captured. By virtue of the large volume of literature considered and the consistency of themes identified across different countries and earthquake events suggest that our findings are fairly robust. That said, given that each earthquake event is unique, the value of in-depth analysis of one specific event may be less useful in informing broader, general planning for future events elsewhere and contextualisation of our findings will be required.

Conclusion

Our review has shown that there are a wide range of health and healthcare impacts following earthquakes in LMICs with different manifestations and priority over time. Whilst the settings may differ, there are many common themes emerging from different earthquake events. It is clear, whilst there are significant negative impacts of earthquakes, preparedness is vital to mitigate the impacts of earthquakes.

Ethical Approval

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Competing Interests

Author AL is an associate editor of the journal.

References

1. UNISDR. Making Development Sustainable: The Future of Disaster Risk Management. Global Assessment Report on Disaster Risk Reduction. Geneva, Switzerland: United Nations Office for Disaster Risk Reduction (UNISDR); 2015 [cited 2016 26th August]; Available from: http://www.preventionweb.net/english/hyogo/gar/2015/en/gar-pdf/GAR2015_EN.pdf.
2. Doocy S, Daniels A, Packer C, Dick A, Kirsch TD. The human impact of earthquakes: a historical review of events 1980-2009 and systematic literature review. *PLoS Curr.* 2013; 5.
3. Rathore FAz. Revisiting the 2005 Earthquake Paraplegics: What Has Changed in a Decade? *Journal of Ayub Medical College, Abbottabad : JAMC.* 2015;513-4.
4. Morris S. Haiti earthquake: perspectives from the ground and lessons from afar. *Disaster medicine and public health preparedness.* 2010; 4:113-5.
5. Sheppard PS, Landry MD. Lessons from the 2015 earthquake(s) in Nepal: implication for rehabilitation. *Disability & Rehabilitation.* 2016; 38:910-3 4p.
6. UNISDR. Sendai Framework for Disaster Risk Reduction. 2016 [cited 2016 26th August]; Available from: <http://www.unisdr.org/we/coordinate/sendai-framework>.
7. London School of Hygiene and Tropical Medicine HSoPH, Overseas Development Institute. An evidence review of research on health interventions in humanitarian crises. 2015 [cited 2016 8th September]; Available from: <http://www.elrha.org/wp-content/uploads/2015/01/Evidence-Review-22.10.15.pdf>.
8. ALNAP. Nepal Earthquake Response: Lessons for Responding Agencies. 2015 [cited 2015 8th September]; Available from: <http://www.alnap.org/resource/20140>.
9. Bartels SA, VanRooyen MJ. Medical complications associated with earthquakes. *The Lancet.* 2012; 379:748-57.
10. Khan F, Amatya B, Gosney J, Rathore FA, Burkle Jr FM. Medical Rehabilitation in Natural Disasters: A Review. *Archives of Physical Medicine and Rehabilitation.* 2015; 96:1709-27.
11. Uscher-Pines L. Health effects of relocation following disaster: a systematic review of the literature. *Disasters.* 2009; 33:1-22.
12. Chan EYY, Gao Y, Griffiths SM. Literature review of health impact post-earthquakes in China 1906–2007. *Journal of Public Health.* 2010; 32:52-61.
13. Kokai M, Fujii S, Shinfuku N, Edwards G. Natural disaster and mental health in Asia. *Psychiatry and Clinical Neurosciences.* 2004; 58:110-6.
14. Bradt DA, Aitken P. Disaster medicine reporting: the need for new guidelines and the CONFIDE statement. *Emerg Med Australas.* 2010; 22:483-7.
15. Challen K, Lee ACK, Booth A, Gardois P, Woods HB, Goodacre SW. Where is the evidence for emergency planning: a scoping review. *BMC Public Health.* 2012; 12:542.
16. Lee AC, Booth A, Challen K, Gardois P, Goodacre S. Disaster management in low- and middle-income countries: scoping review of the evidence base. *Emerg Med J.* 2014; 31:e78-83.
17. Lettieri E, Masella C, Radaelli G. Disaster management: findings from a systematic review. *Disaster Prevention and Management: An International Journal.* 2009; 18:117-36.
18. Evidence Aid Priority Setting Group EA. Prioritization of themes and research questions for health outcomes in natural disasters, humanitarian crises or other major healthcare emergencies. *PLoS Curr.* 2013; 5.
19. Arksey H, O'Malley L. Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology.* 2005; 8:19-32.
20. World Bank. World Bank Country and Lending Groups. 2016 [cited 2016 22nd March]; Available from: <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>.
21. UNISDR. History. Undated [cited 2016 8th September]; Available from: <http://www.unisdr.org/who-we-are/history>.

22. Awais SM, Dar UZ, Saeed A. Amputations of limbs during the 2005 earthquake in Pakistan: a firsthand experience of the author. *International orthopaedics*. 2012; 36:2323-6.
23. Benner P, Stephan J, Renard A, Petitjean F, Larger D, Pons D, et al. Role of the French rescue teams in Diquini Hospital: Port-au-Prince, January 2010. *Prehospital and disaster medicine*. 2012; 27:615-9.
24. Phalkey R, Reinhardt JD, Marx M. Injury epidemiology after the 2001 Gujarat earthquake in India: a retrospective analysis of injuries treated at a rural hospital in the Kutch district immediately after the disaster. *Global health action*. 2011; 4:7196-.
25. Roshchin GG, Mazurenko OV. Ukrainian's disaster medicine team mission to India following the earthquake of 2001. *Prehospital and Disaster Medicine*. 2002; 17:163-6.
26. Roy N, Shah H, Patel V, Bagalkote H. Surgical and psychosocial outcomes in the rural injured--a follow-up study of the 2001 earthquake victims. *Injury*. 2005; 36:927-34.
27. Teicher CL, Alberti K, Porten K, Elder G, Baron E, Herard P. Medecins Sans frontieres experience in orthopedic surgery in postearthquake Haiti in 2010. *PREHOSPITAL AND DISASTER MEDICINE*. 2014; 29:21-6.
28. Walk RM, Donahue TF, Stockinger Z, Knudson MM, Cubano M, Sharpe RP, et al. Haitian earthquake relief: disaster response aboard the USNS comfort. *Disaster medicine and public health preparedness*. 2012; 6:370-7.
29. Coughlin RR, Roy N, Patel V. Wrong place, wrong time: Coincidental involvement in the Gujarat earthquake, India (2001). *Journal of Orthopaedic Trauma*. 2015; 29:S11-S3.
30. Ahmad MA, Naqui SZ, Shah N, Khan A, Alexander-Williams JM, Jaffery A. The Pakistan earthquake: a British trainee's experience. *Injury*. 2006; 37:567-9.
31. Jaffer AK, Campo RE, Gaski G, Reyes M, Gebhard R, Ginzburg E, et al. An academic center's delivery of care after the Haitian earthquake. 2010. p. 262-5.
32. Sarani B, Mehta S, Ashburn M, Gupta R, Dombroski D, Raymonville M, et al. Evolution of operative interventions by two university-based surgical teams in Haiti during the first month following the earthquake. *Prehospital and disaster medicine*. 2011; 26:206-11.
33. Bayard D. Haiti earthquake relief, phase two--long-term needs and local resources. *The New England journal of medicine*. 2010; 362:1858-61.
34. Bhatti SH, Ahmed I, Qureshi NA, Akram M, Khan J. Head trauma due to earthquake October, 2005 - experience of 300 cases at the Combined Military Hospital Rawalpindi. *Journal of the College of Physicians and Surgeons--Pakistan : JCPSP*. 2008; 18:22-6.
35. Burnweit C, Stylianos S. Disaster response in a pediatric field hospital: lessons learned in Haiti. *Journal of pediatric surgery*. 2011; 46:1131-9.
36. Pape JW, Rouzier V, Ford H, Joseph P, Johnson WD, Fitzgerald DW. The GHESKIO field hospital and clinics after the earthquake in Haiti--dispatch 3 from Port-au-Prince. *The New England journal of medicine*. 2010; 362:e34.
37. Yasin MA, Malik SA, Nasreen G, Safdar CA. Experience with mass casualties in a subcontinent earthquake. *Ulusal Travma ve Acil Cerrahi Dergisi*. 2009; 15:487-92.
38. Sami F, Ali F, Zaidi SHH, Rehman H, Ahmad T, Siddiqui MI. The October 2005 earthquake in Northern Pakistan: patterns of injuries in victims brought to the Emergency Relief Hospital, Doraha, Mansehra. *Prehospital and Disaster Medicine*. 2009; 24:535-9.
39. Mallick M, Aurakzai JK, Bile KM, Ahmed N. Large-scale physical disabilities and their management in the aftermath of the 2005 earthquake in Pakistan. *Eastern Mediterranean Health Journal*. 2010; 16:S98-105.
40. Smith RM, Dyer GSM, Antonangeli K, Arredondo N, Bedlion H, Dalal A, et al. Disaster triage after the Haitian earthquake. *Injury*. 2012; 43:1811-5.
41. McDowell D, Barnes D. The haitian earthquake crisis: The first responders' perspective. *West Indian Medical Journal*. 2011; 60:360-6.

42. McIntyre T, Hughes CD, Pauyo T, Sullivan SR, Rogers Jr SO, Raymonville M, et al. Emergency surgical care delivery in post-earthquake Haiti: Partners in Health and Zanmi Lasante experience. *World journal of surgery*. 2011; 35:745-50.
43. Rathore MFA, Farooq F, Butt AW, Gill ZA. An update on spinal cord injuries in October 2005 earthquake in Pakistan. *Spinal cord*. 2008; 46:461-2.
44. Landry M. Spinal cord injury in post-earthquake Haiti: Perspectives on the emerging role of physical therapists in emergency humanitarian responses. *Physiotherapy (United Kingdom)*. 2011; 97:eS1533-eS4.
45. Landry MD, O'Connell C, Tardif G, Burns A. Post-earthquake Haiti: the critical role for rehabilitation services following a humanitarian crisis. *Disability and rehabilitation*. 2010; 32:1616-8.
46. Malik TK, Arshad M, Khalid R, Piracha A. Collaboration of global healthcare systems in earthquake relief in Pakistan: Role of APPNA and US healthcare in the year 2005/6. *JOURNAL OF GENERAL INTERNAL MEDICINE*. 2006; 21:191-2.
47. Rathore FA, Farooq F, Muzammil S, New PW, Ahmad N, Haig AJ. Spinal cord injury management and rehabilitation: highlights and shortcomings from the 2005 earthquake in Pakistan. *Archives of physical medicine and rehabilitation*. 2008; 89:579-85.
48. Missair A, Gebhard R, Pierre E, Cooper L, Lubarsky D, Frohock J, et al. Surgery under extreme conditions in the aftermath of the 2010 haiti earthquake: The importance of regional anesthesia. *Prehospital and Disaster Medicine*. 2010; 25:487-93.
49. Rajbhandari AK, Dhital R, Pradhan PMS, Subhani H, Shrestha SM. Aftershocks of a Mega Earthquake on Occupational Health in Nepal. *Annals of Global Health*. 2015; 81:482-6.
50. Merin O, Miskin IN, Lin G, Wiser I, Kreiss Y. Triage in mass-casualty events: the Haitian experience. *Prehospital and disaster medicine*. 2011; 26:386-90.
51. Peranteau WH, Havens JM, Harrington S, Gates JD. Re-establishing surgical care at Port-au-Prince General Hospital, Haiti. *Journal of the American College of Surgeons*. 2010; 211:126-30.
52. Steinman M, Lottenberg C, Pavao OF, Kanamura A, Aranha LFC, Cenderoglo M, et al. Emergency response to the Haitian earthquake--as bad as it gets. *Injury*. 2012; 43:386-7.
53. Sabri AA, Qayyum MA. Why medical students should be trained in disaster management: our experience of the Kashmir earthquake. *PLoS medicine*. 2006; 3:1452-3.
54. Ripp JA, Bork J, Koncicki H, Asgary R. The response of academic medical centers to the 2010 Haiti earthquake: the Mount Sinai School of Medicine experience. *The American journal of tropical medicine and hygiene*. 2012; 86:32-5.
55. Chu K, Stokes C, Trelles M, Ford N. Improving effective surgical delivery in humanitarian disasters: lessons from Haiti. *PLoS medicine*. 2011; 8:1-4.
56. Broach JP, McNamara M, Harrison K. Ambulatory care by disaster responders in the tent camps of Port-au-Prince, Haiti, January 2010. *DISASTER MEDICINE AND PUBLIC HEALTH PREPAREDNESS*. 2010; 4:116-21.
57. Centers for Disease Control. Post-earthquake injuries treated at a field hospital --- Haiti, 2010. *MMWR Morbidity and mortality weekly report*. 2011; 59:1673-7.
58. Kreiss Y, Merin O, Peleg K, Levy G, Vinker S, Sagi R, et al. Early disaster response in Haiti: The Israeli field hospital experience. 2010. p. 45-8.
59. van Berlaer G, Staes T, Danschutter D, Ackermans R, Zannini S, Rossi G, et al. Disaster preparedness and response improvement: comparison of the 2010 Haiti earthquake-related diagnoses with baseline medical data. *European journal of emergency medicine : official journal of the European Society for Emergency Medicine*. 2016:1-7.
60. Krcmery V. Early versus late onset infections during Haiti earthquake 2010. *International Journal of Antimicrobial Agents*. 2013; 42:S26-S.
61. Tessera RA. Acute Respiratory Infection, Main Cause For Morbidity For Children 0-5 Years Of Age, In Postearthquake, Haiti, 2010. *AMERICAN JOURNAL OF TROPICAL MEDICINE AND HYGIENE*. 2010; 83:338-.

62. Anand KJS, Eubanks JW, Kelly DM, Meier JW, Saltzman JA, Crisler SC, et al. Pediatric Patients Seen in Port-au-Prince, Haiti. *Clinical Pediatrics*. 2010; 49:1147-52 6p.
63. Chan EYY, Kim JJ. Characteristics and health outcomes of internally displaced population in unofficial rural self-settled camps after the 2005 Kashmir, Pakistan earthquake. *European journal of emergency medicine : official journal of the European Society for Emergency Medicine*. 2010; 17:136-41.
64. Restrepo HE. Earthquake in Colombia: The tragedy of the coffee growing region. Health impact and lessons for the health sector. *Journal of Epidemiology and Community Health*. 2000; 54:761-5.
65. Tan CM, Lee VJ, Chang GH, Ang HX, Seet B. Medical response to the 2009 Sumatra earthquake: Health needs in the post-disaster period. *Singapore Medical Journal*. 2012; 53:99-103.
66. Fuady A, Pakasi TA, Mansyur M. Primary Health Centre disaster preparedness after the earthquake in Padang Pariaman, West Sumatra, Indonesia. *BMC research notes*. 2011; 4:81-.
67. Centers for Disease Control. Launching a national surveillance system after an earthquake - Haiti, 2010. *Morbidity and Mortality Weekly Report*. 2010; 59:933-8.
68. Centers for Disease Control. Rapid establishment of an internally displaced persons disease surveillance system after an earthquake - Haiti, 2010. *Morbidity and Mortality Weekly Report*. 2010; 59:939-45.
69. Townes DA, Amsalu R, Magloire R, Chang M, McMorrow M. Malaria surveillance in haiti, post-earthquake, 2010. *AMERICAN JOURNAL OF TROPICAL MEDICINE AND HYGIENE*. 2010; 83:231-.
70. Karmakar S, Rathore AS, Kadri SM, Dutt S, Khare S, Lal S. Post-earthquake outbreak of rotavirus gastroenteritis in Kashmir (India): an epidemiological analysis. *Public health*. 2008; 122:981-9.
71. Armenian HK, Melkonian AK. Long term mortality and morbidity related to degree of damage following the 1988 earthquake in Armenia. *American Journal of Epidemiology*. 1998; 148:1077-84.
72. Matheson AI, Baseman JG, Wagner SH, O'Malley GE, Puttkammer NH, Emmanuel E, et al. Implementation and expansion of an electronic medical record for HIV care and treatment in Haiti: An assessment of system use and the impact of large-scale disruptions. *International Journal of Medical Informatics*. 2012; 81:244-56.
73. Puttkammer NH, Zeliadt SB, Balan JG, Baseman JG, Destine R, Domercant JW, et al. Before and after the earthquake: a case study of attrition from the HIV antiretroviral therapy program in Haiti. *Global health action*. 2014; 7:24572-.
74. Chadda RK, Malhotra A, Kaw N, Singh J, Sethi H. Mental health problems following the 2005 earthquake in Kashmir: Findings of community-run clinics. Cambridge University Press; 2007. p. 541-5.
75. Hamayun A. South Asian earthquake: Psychiatric experience in a tertiary hospital. A. Hamayun, Institute of Psychiatry, Rawalpindi General Hospital, Rawalpindi, Pakistan. E-mail: asmah@isb.comsats.net.pk: World Health Organization; 2008. p. 1205-16.
76. Shrestha R. Post-traumatic Stress Disorder among Medical Personnel after Nepal earthquake, 2015. *Journal of Nepal Health Research Council*. 2015; 13:144-8.
77. Woerschling JC, Snyder AE. Earthquakes in El Salvador: A descriptive study of health concerns in a rural community and the clinical implications. Part III-mental health and psychosocial effects. *Disaster Management and Response*. 2004; 2:40-5.
78. Anwar J, Mpfu E, Matthews LR, Shadoul AF, Brock KE. Reproductive health and access to healthcare facilities: risk factors for depression and anxiety in women with an earthquake experience. *BMC public health*. 2011; 11:523-.
79. Guimaro MS, Steinman M, Kernkraut AM, Santos OF. Psychological distress in survivors of the 2010 Haiti earthquake. *Einstein (Sao Paulo, Brazil)*. 2013; 11:11-4.

80. Hashmi S, Petraro P, Rizzo T, Nawaz H, Choudhary R, Tessier-Sherman B, et al. Symptoms of Anxiety, Depression, and Posttraumatic Stress Among Survivors of the 2005 Pakistani Earthquake. *DISASTER MEDICINE AND PUBLIC HEALTH PREPAREDNESS*. 2011; 5:293-9.
81. Ali M, Farooq N, Bhatti MA, Kuroiwa C. Assessment of prevalence and determinants of posttraumatic stress disorder in survivors of earthquake in Pakistan using Davidson Trauma Scale. *Journal of affective disorders*. 2012; 136:238-43.
82. Cousins S. Nepal's silent epidemic of suicide. *Lancet (London, England)*. 2016; 387:16-7.
83. Khachadourian V, Armenian H, Demirchyan A, Melkonian A, Hovanesian A. A post-earthquake psychopathological investigation in Armenia: Methodology, summary of findings, and follow-up. *DISASTERS*. 2015; 40:518-33.
84. Najarian LM, Sunday S, Labruna V, Barry I. Twenty-year follow-up of adults traumatized during childhood in Armenia. *JOURNAL OF AFFECTIVE DISORDERS*. 2011; 135:51-5.
85. Armenian HK, Morikawa M, Melkonian AK, Hovanesian A, Akiskal K. Risk factors for depression in the survivors of the 1988 earthquake in Armenia. *Journal of Urban Health*. 2002; 79:373-82.
86. ACAPS. Disaster Summary Sheets Earthquakes. 2012 [cited 2016 8th September]; Available from: https://www.acaps.org/sites/acaps/files/resources/files/disaster_summary_sheet-earthquakes_january_2012.pdf.
87. World Health Organization. Global assessment of national health sector emergency preparedness and response. 2008 [cited 2016 7th November]; Available from: http://www.who.int/hac/about/Global_survey_inside.pdf?ua=1.
88. World Health Organization. Integrating sexual and reproductive health into health emergency and disaster risk management. 2012 [cited 2016 24th November]; Available from: http://apps.who.int/iris/bitstream/10665/75860/1/WHO_RHR_12.32_eng.pdf?ua=1.
89. Harville EW, Do M. Reproductive and Birth Outcomes in Haiti before and after the 2010 Earthquake. *DISASTER MEDICINE AND PUBLIC HEALTH PREPAREDNESS*. 2015; 10:59-66.
90. Guy PJ, Ineson N, Bailie R, Grimwood A. Operation Nightingale: The role of BMH Dharan following the 1988 Nepal earthquake, and some observations on Third World earthquake disaster relief missions. *Journal of the Royal Army Medical Corps*. 1990; 136:7-18.
91. Hapsari ED, Widyawati, Nisman WA, Lusmilasari L, Siswishanto R. Change in contraceptive methods following the Yogyakarta earthquake and its association with the prevalence of unplanned pregnancy. *Contraception*. 2009; 79:316-22.
92. Bainbridge J. Baby boom in Kashmir: one year on from the earthquake. *British Journal of Midwifery*. 2006; 14:715- 1p.
93. Behrman JA, Weitzman A. Effects of the 2010 Haiti Earthquake on Women's Reproductive Health. *Studies in Family Planning*. 2016; 47:3-17.
94. Djafri D. SP5-22 The assessment of contraceptive methods following the 2009 Padang earthquake. *Journal of Epidemiology and Community Health*. 2011; 65:A451-A.
95. Djafri D, Chongsuvatwong V, Geater A. Effect of the September 2009 Sumatra earthquake on reproductive health services and MDG 5 in the city of Padang, Indonesia. *Asia-Pacific journal of public health / Asia-Pacific Academic Consortium for Public Health*. 2015; 27:NP1444-56.
96. Kolbe AR, Hutson RA, Shannon H, Trzcinski E, Miles B, Levitz N, et al. Mortality, crime and access to basic needs before and after the Haiti earthquake: a random survey of Port-au-Prince households. *Medicine, conflict, and survival*. 2010; 26:281-97.
97. Keshkar S, Kumar R, Bharti BB. Epidemiology and impact of early rehabilitation of spinal trauma after the 2005 earthquake in Kashmir, India. *International orthopaedics*. 2014; 38:2143-7.
98. Ali I, Mir AA, Jabeen R, Ahmad M, Fazili A, Kaul R-UR, et al. Morbidity pattern and impact of rehabilitative services in Earth quake victims of kashmir, India. *International journal of health sciences*. 2010; 4:59-67.

99. Butt BA, Bhatti JA, Manzoor MS, Malik KS, Shafi MS. Experience of makeshift spinal cord injury rehabilitation center established after the 2005 earthquake in Pakistan. *Disaster medicine and public health preparedness*. 2010; 4:8-9.
100. Dailey SK, Casstevens EC, Archdeacon MT, Mamczak CN, Burgess AR. Assessment of pelvic fractures resulting from the 2010 Haiti earthquake: opportunities for improved care. *The journal of trauma and acute care surgery*. 2014; 76:866-70.
101. Kaim Khani GM, Baig A, Humail M, Memon M, Quarashi MA. Musculoskeletal injuries among victims of the Battagram, Pakistan earthquake in October 2005. *Prehospital and disaster medicine*. 2012; 27:489-91.
102. Lodhi A, Khan SA, Ahmed E, Fatima S, Fatima F, Pasha T, et al. Pre-hospital management of spinal injuries in a natural disaster. *Journal of Ayub Medical College, Abbottabad : JAMC*. 2011; 23:10-2.
103. Hunt MR, Chung R, Durocher E, Henrys JH. Haitian and international responders' and decisionmakers' perspectives regarding disability and the response to the 2010 Haiti earthquake. *GLOBAL HEALTH ACTION*. 2015; 8:27969-.
104. Khan M, Masood M, Mukhtar M, Sana N. Gender differences in prevalence of anxiety disorders among earth quake survivors. *European Psychiatry*. 2010; 25:no pagination-no pagination.
105. Pynoos RS, Goenjian A, Tashjian M, Karakashian M, Manjikian R, Manoukian G, et al. Post-traumatic stress reactions in children after the 1988 Armenian earthquake. *British Journal of Psychiatry*. 1993; 163:239-47.
106. Rose N, Hughes P, Ali S, Jones L. Integrating mental health into primary health care settings after an emergency: Lessons from Haiti. Rose, Nick, nick.rose276@ntlworld.com: War Trauma Foundation; 2011. p. 211-24.
107. Doocy S, Jacquet G, Cherewick M, Kirsch TD. The injury burden of the 2010 Haiti earthquake: a stratified cluster survey. *Injury*. 2013; 44:842-7.
108. Helminen M, Saarela E, Salmela J. Characterisation of patients treated at the Red Cross field hospital in Kashmir during the first three weeks of operation. *Emergency medicine journal : EMJ*. 2006; 23:654-6.
109. Jackson A, Little M. On the ground in Nias in response to an earthquake--an emergency team's experience. *Emergency medicine Australasia : EMA*. 2006; 18:199-202.
110. Mujeeb SA, Jaffery SH. Emergency blood transfusion services after the 2005 earthquake in Pakistan. *Emergency medicine journal : EMJ*. 2007; 24:22-4.
111. Rose-Wood A, Heard N, Thermidor R, Chan J, Joseph F, Lerebours G, et al. Development and use of a master health facility list: Haiti's experience during the 2010 earthquake response. *Global health, science and practice*. 2014; 2:357-65.
112. Vanholder R, van der Tol A, De Smet M, Hoste E, Koç M, Hussain A, et al. Earthquakes and crush syndrome casualties: lessons learned from the Kashmir disaster. *Kidney international*. 2007; 71:17-23.
113. Roy N, Shah H, Patel V, Coughlin RR. The Gujarat earthquake (2001) experience in a seismically unprepared area: community hospital medical response. *Prehospital and disaster medicine : the official journal of the National Association of EMS Physicians and the World Association for Emergency and Disaster Medicine in association with the Acute Care Foundation*. 2002; 17:186-95.
114. Farfel A, Assa A, Amir I, Bader T, Bartal C, Kreiss Y, et al. Haiti earthquake 2010: a field hospital pediatric perspective. *European journal of pediatrics*. 2011; 170:519-25.
115. Sugino M, Hapsari ED, Madyaningrum E, Haryant F, Warsini S, Takada S, et al. Issues raised by nurses and midwives in a post-disaster Bantul community. *Disaster Prevention and Management*. 2014; 23:420-36.
116. Badiger S, Rashmi, Jain A, Rekha T, Prasanna Mithra M, Ganesh Kumar S, et al. Disaster preparedness of hospitals in a coastal city of South India. 2011. p. 247-8.

117. Dzwonczyk R, Riha C. Medical equipment donations in Haiti: flaws in the donation process. *Revista Panamericana de Salud Pública*. 2012; 31:345-8.
118. Hairapetian A, Alexanian A, Féfir MC, Agoudjian V, Schmets G, Dallemagne G, et al. Drug supply in the aftermath of the 1988 Armenian earthquake. *The Lancet*. 1990; 335:1388-90.
119. Hughes CD, Nash KA, Alkire BC, McClain CD, Hagander LE, Smithers CJ, et al. The impact of natural disaster on pediatric surgical delivery: a review of Haiti six months before and after the 2010 earthquake. *Journal of health care for the poor and underserved*. 2012; 23:523-33.
120. Bukhari SKS, Qureshi JARH, Jooma R, Bile KM, Kazi GN, Zaibi WA, et al. Essential medicines management during emergencies in Pakistan. *Eastern Mediterranean Health Journal*. 2010; 16:S106-13.
121. Haar RJ, Naderi S, Acerra JR, Mathias M, Alagappan K. The livelihoods of Haitian health-care providers after the January 2010 earthquake: a pilot study of the economic and quality-of-life impact of emergency relief. *International journal of emergency medicine*. 2012; 5:13-.
122. Thormar SB, Gersons BPR, Juen B, Djakababa MN, Karlsson T, Olff M. Organizational factors and mental health in community volunteers. The role of exposure, preparation, training, tasks assigned, and support. *Anxiety, stress, and coping*. 2013; 26:624-42.
123. Filmer LB, Ranse J. Who is my leader? A case study from a hospital disaster scenario in a less developed country. *Australasian emergency nursing journal : AENJ*. 2013; 16:170-4.
124. World Health Organization. Toolkit for assessing health-system capacity for crisis management. 2012 [cited 2016 7th November]; Available from: http://www.euro.who.int/_data/assets/pdf_file/0008/157886/e96187.pdf.
125. Lee AC. Barriers to evidence-based disaster management in Nepal: a qualitative study. *Public Health*. 2016; 133:99-106.
126. World Health Organization. Guidelines for medicine donations. 2010 [cited 2016 24th November]; Available from: http://www.who.int/selection_medicines/emergencies/guidelines_medicine_donations/en/.
127. Smith SM, Gorski J, Vennelakanti HC. Disaster preparedness and response: a challenge for hospitals in earthquake-prone countries. *International Journal of Emergency Management*. 2010; 7:209-.