An evidence review of research on health interventions in humanitarian crises

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Disclaimer
This is a collaborative report from the London School of Hygiene and Tropical Medicine, the Harvard School of Public Health and the Overseas Development Institute (ODI). Any opinions and recommendations contained therein are those of the report authors, not of ELRHA, DFID or the Wellcome Trust.
Background
The need for a stronger scientific evidence base for responses to humanitarian crises has been identified by various public health actors. To this end, the UK Department for International Development (DFID) and the Wellcome Trust commissioned a project to review the evidence base of public health interventions in humanitarian crises. The overall aim of the project is to provide a rigorous assessment of the current quality and depth of the evidence-base that informs humanitarian public health programming globally. The project therefore assesses the quantity and quality of intervention studies, rather than measuring the actual effectiveness of the intervention itself.

The project addresses evidence on interventions in humanitarian crises (including early recovery and forced displacement) for health topics of: communicable disease control; water, sanitation and hygiene (WASH); nutrition; sexual and reproductive health (SRH), including gender-based violence (GBV); mental health and psychosocial support; non-communicable disease (NCD); injury and physical rehabilitation, health services, and health systems. In addition, contextual factors influencing the delivery of health-related interventions are included in the project, consisting of: access to health services, health assessment methods, coordination, accountability, health worker security, and urbanisation.

Methods
The research project uses the following two main methods:
(i) A series of systematic literature reviews on evidence of humanitarian interventions related to the health topics and on the influence of contextual factors on the interventions. The systematic review on evidence of interventions for the different health topics included quantitative evidence from published and grey literature. The systematic review on the contextual factors included quantitative and qualitative evidence from the published literature. Standard systematic review methodologies were used.
(ii) Qualitative individual interviews with expert practitioners, policy makers and academics to identify critical weaknesses and gaps in the evidence base for humanitarian public health actions (including related to the contextual factors) and to recommend priority areas for further research. A series of more general consultations with humanitarian health experts through meetings in London, Geneva, Paris, and New York.

Results
An overview of the main results is firstly presented, followed by the results of the individual health topics and contextual factors.

Overview
● Research on the effectiveness of health interventions in humanitarian crises has significantly increased during the last decade, with 76% of the 706 studies selected in the systematic review published between 2000 and 2012. However, considering the diversity of humanitarian crises, contexts and health care needs, the volume of evidence available remains too limited – particularly for health topics of gender-based violence (GBV) and water, sanitation and hygiene (WASH).
● 60% of the studies reviewed in-depth were rated moderate to high quality, but the quality of research has improved during the last decade.
Interventions for some health topics require further evidence on their actual effectiveness (e.g. GBV and mental and psychosocial health) whereas other topics require evidence on the most effective way of delivering the health intervention (e.g. injury & rehabilitation, WASH, NCD, SRH), while nutrition and communicable disease control tend to require evidence on the effectiveness of some interventions and also evidence on the most effective way of delivering others types of interventions.

Common themes identified in all the health topics and contextual factors include:

- Systems and delivery: more evidence on the effectiveness and feasibility of inter-sectoral interventions, scaling-up, task-shifting, and supporting health system resilience.
- Research methods: development and validation of robust assessment methods; greater use of certain research designs (particularly for cost-effectiveness) and baseline and routine data; and high quality mixed methods studies.
- Context: Greater evidence is required on dispersed, urban and rural populations; on ensuring continuity of care – particularly for chronic conditions and NCDs; and measuring and addressing health care needs in middle-income settings (particularly NCDs).

**Communicable disease control**

Seventy two studies on communicable disease control interventions met the inclusion criteria and were reviewed in depth. Thirty four were graded as high quality. The following highlights the research needs identified from the systematic review and expert interviews:

- Research should be conducted to help standardise medical protocols and quality standards to direct interventions, and indicators to measure their impact.
- Specific evidence gaps exist around many issues related to communicable diseases: disease themselves (e.g. pertussis, hepatitis A and E, and measles), methods to measure them (e.g. Quality Assurance Sampling (LQAS)), and standard measurements such as mortality (e.g. age and gender specific).
- Increasing urbanisation, and movement of people to coastal areas, means that more research is needed on populations living in these areas.
- More attention needs to be given to regional analysis amongst these populations, especially due to issues related to migration and importation of disease.
- More anthropological/sociological research is needed for communicable disease interventions (e.g. acceptability).
- Research could help validate syndromic diagnoses (e.g. diarrhoea) with laboratory confirmed (e.g. shigella) outcomes for communicable disease interventions.

**Water, Sanitation and Hygiene (WASH)**

Only eight studies on WASH interventions met the inclusion criteria, and three were of high quality. The following highlights the research needs identified from the systematic review and expert interviews:

- More research expertise is needed to guide operational organisations on how WASH interventions can be linked to health outcomes, including on the use of different study designs.
- A review of Sphere indicators for the WASH sector is needed.
- More research is needed on behaviour change (e.g. acceptability of interventions, barriers to uptake).
- The evidence base on specific WASH interventions for health outcomes (e.g. hepatitis E, cholera) needs to be strengthened.
- Economic and anthropological research is needed. What level of success is acceptable to communities, governments, etc in relation to health effects seen as well as money spent?
Nutrition
Seventy-seven studies on nutrition interventions met the inclusion criteria, and 18 were of high quality. The following highlights the research needs identified from the systematic review and expert interviews:

- A better understanding of the aetiology of malnutrition and famines in different contexts is required.
- Evidence on the impact of contextual factors on famine and malnutrition (e.g. anthropological studies on the power of women in society).
- Evidence on how best to intervene in low Global Acute Malnutrition (GAM) prevalence settings and/or in middle income countries.
- Need to test different monitoring tools, techniques and new technologies to measure progress and impact of nutrition programmes, including better use of routine data and monitoring and evaluation data.
- More evidence on cost-effectiveness of nutrition interventions.
- More evidence required on the impact of Infant and Young Child Feeding interventions (IYCF).
- Research focus needed on infants, people with disabilities and elderly.
- Search alternatives to Blanket Supplementary Feeding programmes (BSFP) (i.e. Cash transfer vs. Ready to Use Food (RUF) distribution; food security intervention vs. RUF).
- More research required on long term effects of interventions (i.e. long-term effects of blanket distribution of lipid based supplement).
- Further research required on stunting.
- Evidence required on the most effective way of delivering nutritional programmes? Community health workers or health facilities?
- Long-term effect of RUF on anthropometric status, cognitive development, risk of relapse etc.

Sexual and reproductive health (SRH), including gender-based violence (GBV)
Thirty-one studies on SRH (including GBV) interventions met the inclusion criteria, and only four were of high quality. Of the 31 studies, only three related to GBV interventions. The following highlights the research needs identified from the systematic review and expert interviews:

- More evidence on SRH interventions with particular populations groups (e.g. people with disabilities, men, adolescents)
- More evidence on different models of scaling up services (e.g. facility- or community-based care, task-shifting, greater involvement of community members).
- Evidence on effectiveness and feasibility of new technologies.
- Evidence on availability and use of SRH commodities in emergencies.
- Evidence on behaviour, knowledge, attitude and barriers to long acting reversible contraception; and implications regarding availability of long-term care.
- More evidence on the provision of safe abortion services, and delivery services (particularly caesarean sections).
- There is extremely limited evidence on GBV. More information is needed on the spectrum and context of GBV.
- Evidence is required on effectiveness and operational constraints of targeted interventions (e.g. safe spaces, cash-transfers, livelihoods programmes).
- Evidence is required on the appropriateness and use of GBV guidelines.
- Development of new methodological approaches to overcome contextual and logistical constraints to research.
Mental health and psychosocial support

Sixty-nine studies of mental health and psychosocial support interventions met the inclusion criteria, and 15 were of high quality. The following highlights the research needs identified from the systematic review and expert interviews:

- Evidence required on effectiveness and feasibility of scaling-up low intensity and low cost psychological interventions.
- Substantially more evidence is required on the effectiveness of psychosocial interventions.
- Evidence required on the effectiveness of group-based interventions as well as interventions for individuals.
- Evidence required on the effectiveness of interventions using parents, natural support systems, and schools.
- Evidence required on the use of inter-sectoral approaches (e.g. nutrition, protection, education).
- Evidence required on using a modular transdiagnostic approach to treating mental disorders, including multiple disorders.
- Evidence on the effectiveness and feasibility of e-mental health interventions.
- Evidence on the effectiveness and feasibility of training interventions.
- Evidence required on the effectiveness of treating severe mental disorders, drug and harmful alcohol use, and functioning.
- Evidence from randomised control trials (RCTs) is required, but also other study designs (including quasi-experimental) and the use the use routine clinical outcome data. Studies should include mixed methods to improve acceptability and appropriateness of interventions and research.
- Substantially more evidence is required on the feasibility of interventions, particularly economic feasibility and cost-effectiveness of interventions.
- Evidence is particularly required for children, adolescents, older populations and survivors of sexual and intimate partner violence.
- Greater evidence is required on the harmful effects of mental health and psychosocial support interventions.
- The quality of research needs to improve in order to ensure valid and reliable results.

Non-Communicable Diseases (NCDs)

Twenty-six studies on NCD interventions met the inclusion criteria, with four of a high quality. The following highlights the research needs identified from the systematic review and expert interviews:

- Strong need for the development and testing of standards and guidelines for the delivery of NCD care in crisis settings.
- There is a need for much more evidence on interventions for a range of leading NCDs, particularly addressing longer-term outcomes.
- There is a need for much more evidence on NCD interventions from a range of different country settings.
- Studies are needed on the feasibility and cost of NCD interventions, particularly over the longer-term.
- Evidence on experiences of collaborations and benefits with other sectors (e.g. nutrition) is required.

Injury and Rehabilitation

Seventy-six studies on injury and rehabilitation interventions met the inclusion criteria and were reviewed in-depth, and only two were of a high quality. The following highlights the research needs identified from the systematic review and expert interviews:

- Greater quantity and quality of evidence is required on the effectiveness and cost-effectiveness of rehabilitative interventions, particularly rehabilitative interventions and over the longer-term – including measuring long-term health outcomes, functionality, and quality of life.
More research is needed to better understand the mechanisms that enable a continuum of care as programmes transition from the crisis to the development phase.

Research is needed to develop appropriate quality standards and measurements of service performance.

More evidence must be collected following natural disasters, as illustrated by the response to the 2010 Haitian Earthquake.

More evidence should be collected related to rehabilitation interventions in camp contexts.

More studies are needed that evaluate rehabilitation interventions in the preparedness phase, and the subsequent impact they have on health outcomes.

**Health Service Delivery**

Thirty-two studies on health service delivery met the inclusion criteria but only four papers measured health outcomes and these were of a low quality. The following highlights the research needs identified from the systematic review and expert interviews:

- There is a strong need to improve the quantity and quality of the evidence base on health service interventions, particularly longitudinal studies of longer-term health service interventions and related health outcomes.
- More research is required on different service delivery models of health care.
- More research is required on the content, delivery and health outcomes of different service delivery packages of care.
- Longitudinal study designs are needed to help capture this information.
- There was a lack of consensus over the guidelines to be used, or even evaluated, for health service delivery. Further studies looking specifically at this issue would enable practical suggestions for service delivery in crisis situations.

**Health Systems**

Fifty-six studies on health systems met the inclusion criteria. The following highlights the research needs identified from the systematic review and expert interviews:

- There is a need for further research to measure the impact crises can have on local health systems.
- Evidence is required on the effectiveness of different models of delivering health interventions during humanitarian crises: vertical versus integrated humanitarian interventions, facility-based versus community-based interventions, comprehensive package versus single interventions.
- Evidence is required on the resilience of health systems to absorb crises and on their capacities to continue the delivery of services (e.g. non-communicable diseases) after the departure of humanitarian actors.
- Evidence is required on the impact of preparedness on a humanitarian crisis, and whether stronger and better prepared health systems have improved health outcomes following a humanitarian crisis.
- There is a need for much more research into some of the specific areas of the health system, particularly the influence of health financing and access to essential medicines in a humanitarian crisis.
- Research on how interventions for sub-sectors health could take the opportunities that humanitarian crises offer to strengthen the systems.

**Access to healthcare**

Sixty-four studies on access to healthcare met the inclusion criteria. The following highlights the research needs identified from the systematic review and expert interviews:

- There is a particular paucity of evidence on the impact of physical, economic and political accessibility of health workers on public health interventions during crises.
More research is required on the influence of access on the impact of public health interventions.

Research into the development of standardised methods or indicators to measure the different aspects of both end-user and health worker access to healthcare (which are currently lacking) is required.

Greater research attention should be given to the impact of access to healthcare on health interventions during natural disasters and in the acute phase of crises.

Greater research attention should be given to real-time mapping of access to healthcare of end-users.

Greater research attention should be given to optimising healthcare access in crisis areas outside government control for both end-users and healthcare workers.

Greater research attention should be given to health disparities arising from access inequities between resident and transiting populations within a crisis location.

More research is needed on the role of mobile phones and other digital technologies in improving health access for end-users.

More research is needed into mechanisms and policies which safeguard or improve access to healthcare during humanitarian crises.

Accountability to end-users
Thirty studies on accountability to end-users and health met the inclusion criteria. The following highlights the research needs identified from the systematic review and expert interviews:

- Research on the influence of accountability on the impact of public health interventions is needed.
- Research on the development of standardised methods or indicators to measure the different aspects of accountability in health interventions is required.
- High quality comparative studies are needed to inform how accountability influences health interventions and outcomes.
- More evidence is needed on the role and methods of informed consent of end-users in crisis settings, to the perception of end-users regarding humanitarian healthcare delivery, and to the validation of assumptions concerning end-users.
- More research is required on the impact of the asymmetry of power between end-users and humanitarian agencies on public health interventions.
- Populations needing increased research focus include IDP and refugee populations; adolescents; the disabled; the elderly; those with chronic disease; and the LGBT community.
- More research is needed into mechanisms and policies which safeguard or improve accountability to end-users during humanitarian crises.
- Research into the development of ethical guidelines for humanitarian research and programmatic development should be intensified.

Health Assessment Methods
Eighty-three studies on health assessment methods met the inclusion criteria. The following highlights the research needs identified from the systematic review and expert interviews:

- More quality research is needed on the development, comparison, testing and validation of health assessment methods.
- There is a pressing need for evidence-based consensus-building on the standardised health assessment methods that agencies will agree to use for recognised health topics.
- Greater research attention should be given to the impact of different health assessment methodologies on the effectiveness of public health interventions during humanitarian crises.
Research is needed on the humanitarian system’s ‘fitness-for-purpose’ for addressing health needs within any crisis situation.

Research is needed on the identification of appropriate indicators with which to measure humanitarian contextual factors in relation to health outcomes.

Greater research attention could be given to long-term impact assessment methodologies of the contextual factors in relation to health outcomes (e.g. coordination of communicable diseases and WASH in relation to cholera).

More research is needed into mechanisms and policies that safeguard or improve health assessment methods during humanitarian crises.

**Coordination**

Twenty-five studies on coordination and health met the inclusion criteria. The following highlights the research needs identified from the systematic review and expert interviews:

- More research is needed on the influence of coordination on public health interventions during humanitarian crises, including cost-benefit analysis.
- Research is also needed on non UN/OHCA-centric mechanisms of coordination, including those of local/domestic and non-cluster agencies.
- High quality comparative studies are needed to inform how coordination influences public health interventions, including the role of different levels and aspects of coordination.
- Greater research attention should be given to investigate the health impact of clusters as a coordination mechanism.
- Greater research attention should be given to impact of integrated UN missions on healthcare delivery.
- Greater research attention should be given to how international actors coordinate with local government.
- Research is needed to evaluate the advantages and disadvantages for health of pooled funding within the UN structure.
- Greater research attention should be given to the role of generating competitive market forces between agencies in improving coordination and healthcare delivery efficiency.
- More research is needed into mechanisms and policies which safeguard or improve coordination during humanitarian crises.

**Security of healthcare workers**

Only 16 studies on healthcare worker and health security met the inclusion criteria. The following highlights the research needs identified from the systematic review and expert interviews:

- The issue of security of healthcare workers in the humanitarian sector is disproportionate to the very limited available evidence in both terms of quantity and quality.
- There is a need for more research on how healthcare worker security influences the effectiveness of public health interventions in humanitarian crises.
- High quality comparative studies are needed to inform how security influences health interventions and outcomes, in particular comparing crises of varying security levels, crises in urban vs. rural settings, and crises with international vs. purely local or domestic health assistance.
- Greater research attention should be given to the increased risks posed by integrated UN missions.
- Research is needed to measure the impact of using foreign over local healthcare workers.
- Greater research attention should be given to identification of risk factors associated with security threats to healthcare workers.
Greater research attention should be given to the impact of asymmetry of power on the effectiveness of health interventions within a conflict setting on security.

Research is needed to assess the impact of patients’ perception on security.

Greater research attention should be given to the impact of healthcare worker security on public health interventions during natural disasters and in the acute phase and early recovery phases of crises.

**Urbanisation**

Twenty-seven studies on urbanisation and healthcare met the inclusion criteria. The following highlights the research needs identified from the systematic review and expert interviews:

- More comparative studies between rural, camp and urbanised environments would be very helpful to adjust health interventions to be more effective for urban environments.

- More research is needed on the influence of the following aspects on public health interventions: Opportunities for disaster preparedness and coordination; role of civil engineering and urban planning in disaster prevention and mitigation; use of social media and other forms of mass communication; control of infectious disease outbreaks, public health interventions.

- Greater research attention should be given to efficient methods of identification and targeted health interventions of IDP and refugee populations within non-camp urban settings.

- Greater research attention should be given to the management of chronic disease in crisis-affected urban populations.
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<tr>
<td>ALNAP</td>
<td>Active Learning Network for Accountability and Performance</td>
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<td>BCG</td>
<td>Bacillus Calmette–Guérin</td>
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<tr>
<td>CBT</td>
<td>Cognitive Behavioural Therapy</td>
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<td>CD</td>
<td>Communicable Disease</td>
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<td>CDC</td>
<td>US Centers for Disease Control and Prevention</td>
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<td>CMAM</td>
<td>Community-based Management of Acute Malnutrition</td>
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<td>CONSORT</td>
<td>Consolidated Standards of Reporting Trials</td>
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<td>CRED</td>
<td>Centre for Research on the Epidemiology of Disasters</td>
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<td>DAC</td>
<td>Development Assistance Committee</td>
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<tr>
<td>DARE</td>
<td>Database of Abstracts of Reviews of Effectiveness</td>
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<tr>
<td>DFID</td>
<td>Department for International Development</td>
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<td>DOTS</td>
<td>Directly Observed Therapy Short course</td>
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<td>GAM</td>
<td>Global Acute Malnutrition</td>
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<td>GBV</td>
<td>Gender-Based Violence</td>
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<td>GWA</td>
<td>Gender and Water Alliance</td>
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<td>HSPH</td>
<td>Harvard School of Public Health</td>
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<td>HERR</td>
<td>Humanitarian Emergency Response Review</td>
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<td>IBSS</td>
<td>International Bibliography of the Social Sciences</td>
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<td>ICRC</td>
<td>International Committee of the Red Cross</td>
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<td>IDP</td>
<td>Internally Displaced Persons</td>
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<td>IYCF</td>
<td>Infant and Young Child Feeding</td>
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<td>IGRAC</td>
<td>International Groundwater Resources Assessment Centre</td>
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<td>IMC</td>
<td>International Medical Corps</td>
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<td>IWA</td>
<td>International Water Association</td>
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<td>IWRA</td>
<td>International Water Resources Association</td>
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<td>LSHTM</td>
<td>London School of Hygiene &amp; Tropical Medicine</td>
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<td>MAM</td>
<td>Moderate Acute Malnutrition</td>
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<td>MCH</td>
<td>Maternal and child health</td>
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<td>MSF</td>
<td>Médecins Sans Frontières</td>
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<td>NCD</td>
<td>Non-communicable Disease</td>
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<td>OCHA</td>
<td>Office for the Coordination of Humanitarian Affairs</td>
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<td>OECD</td>
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<td>PRISMA</td>
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<td>RCT</td>
<td>Randomised Controlled Trial</td>
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<td>RHRC</td>
<td>Rural Health Research Center</td>
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<td>RUTF</td>
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1. Introduction

1.1 Background

The need for a stronger scientific evidence base for responses to humanitarian crises has been identified by various public health actors, and was a key recommendation of the United Kingdom Humanitarian Emergency Response Review.1 To this end, the UK Department for International Development (DFID) and the Wellcome Trust commissioned a review of the evidence base of public health interventions in humanitarian crises.2

The overall aim of the project is to provide a rigorous assessment of the current quality and depth of the evidence-base that informs humanitarian public health programming globally. The specific objectives are:

- To present a thorough assessment of the current quality and depth of the available evidence-base for humanitarian public health actions.
- To present a clear and authoritative overview of the frameworks and assumptions which underpin key thematic areas within the humanitarian public health field.
- To identify critical weaknesses in the evidence base, where further research is required.
- Identify, through consultation with practitioners and policy makers, priority areas where further investment in the research and evidence base is most needed.

1.2 Conceptual framework

The conceptual framework used for this project is shown in Figure 1. The framework contains health interventions related to core health topics, and key contextual factors which influence the delivery of the core health interventions in humanitarian crises. The conceptual framework was adapted from Hoffman et al.3 and the selection of health topics, contextual factors and cross-cutting issues informed by Sphere Standards and discussions with key experts.4

![Figure 1: Project conceptual framework](image-url)
2. Methods

The project consists of two main research methods. First, a systematic literature review on evidence on interventions of the health topics and contextual factors. Second, qualitative expert interviews with practitioners, policy makers and academics addressing the core health topics and contextual factors. The research for the health topics was conducted by staff at LSHTM, while the research on the contextual factors was led by staff at Harvard (see Annex 1 for further details on project structure and staffing).

2.1 Systematic literature review on health topics

This series of systematic reviews aims to provide a situational analysis of the existing evidence from humanitarian crises on public health interventions for the following health topics: communicable disease control; water, sanitation and hygiene (WASH); nutrition; sexual and reproductive health (SRH), including gender-based violence (GBV); mental health and psychosocial support; injury and physical rehabilitation; non-communicable disease (NCD); health services; and health systems. The systematic review methodology adheres to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement.

2.1.1 Key terms:

The following key terms and concepts relate to this systematic literature review, their definitions having been adapted from the World Health Organization (WHO) Humanitarian Health Action Dictionary.

Public Health Intervention: Public health actions that seek to improve health outcomes.

Humanitarian crisis: A serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources, necessitating a request to national or international level for external assistance. The disaster situation may either be manmade (e.g. armed conflict) or a natural phenomenon (e.g. drought).

Man-made humanitarian disasters: These include international armed conflicts; non-international armed conflicts; and other situations of violence.

Natural disasters: These include hazardous natural phenomena leading to humanitarian crises such as earthquakes, volcanic activity, landslides, tsunamis, tropical cyclones and other severe storms, tornados and high winds, floods, and droughts.

Early Recovery: Early Recovery is defined as recovery that begins early in a humanitarian setting. It is a multi-dimensional process, guided by development principles. It aims to generate self-sustaining nationally owned and resilient processes for post-crisis recovery.
2.1.2 Search strategy and search terms
This literature review uses peer-reviewed literature, non-peer reviewed (‘grey’) literature, and expert consultation/review of selected references to ensure all key publications have been taken into account.

Peer reviewed literature was located using electronic bibliographic databases such as Medline, Embase, and Global Health (depending on the health topic). The search structure consisted of the following:
- terms related to humanitarian crises
- AND terms related to public health interventions
- AND terms related to lower and middle income economies
- AND terms related to each of the nine health topics above

The search terms used for the main bibliographic databases are given in Annex 3. The additional health topic specific search terms were then added on (see Annexes).

Grey literature was sought using databases, humanitarian agency websites and search engines such as Google, R4D, ReliefWeb, Desastres, Eldis, ALNAP, CRED, RHRC, MSF Field Research, WHO, UNICEF, UNFPA, UNHCR, and ICRC.

Searches were supplemented by reviewing the reference lists (‘references of references’) of selected articles to find any other relevant papers.

The databases and search terms used for each health topic are given in the Annexes.

2.1.3 Inclusion/exclusion criteria
The following seven key inclusion criteria were used in this review:
- **Types of studies:** Primary quantitative research studies. Study designs including randomised controlled trials (RCTs), non-randomised controlled trials, controlled before-after studies, controlled interrupted time series studies, economic studies (cost-effectiveness analysis, cost-utility analysis, cost-benefit analysis, economic modelling) of public health which the outcome is measured before and after the intervention or an intervention is studied against another intervention with baseline or control group.
- **Populations of interest:** Populations affected by humanitarian crises and receiving humanitarian assistance in low and middle-income countries (based upon World Bank country classification).
- **Health outcomes and outputs of interest:** Primary outcomes (e.g. morbidity, mortality, vaccination status), secondary outcomes (e.g. contraceptive prevalence rate), and primary outputs (e.g. malaria bed nets distributed, nutrition supplements provided etc).
- **Crisis Phase:** Studies that occur in humanitarian crises including those that evaluate: i) the impact of preparedness and resilience on public health outcomes during a humanitarian crises and/or ii) studies that evaluate the impact of public health interventions during the acute, chronic, or early recovery phases of humanitarian crises.
- **Data type(s):** Must include primary data.
- **Date of intervention and publication:** January 1, 1980 – April 30, 2013.
- **Publication language:** English, French.
The following criteria were used to exclude studies from this review:
- Studies with no specific health intervention and no outcomes or outputs (i.e., excluding studies that examine only health needs, prevalence, health risk-factors, co-ordination).
- Studies that examine preparedness and resilience not linked to health outcomes in humanitarian crises (e.g., studies on housing fortification before flooding).
- Review papers; only references listed in review papers were screened to find more primary data sources.

2.1.4 Study screening and data extraction
The systematic literature review for each health topic was conducted by one topic leader (see Annex 1 for further details). For quality assurance, a secondary peer reviewer corroborated study selection and data extraction at Stage Four.

Data were screened with the following five stages:
Stage One: electronic database search using terms; with results imported into reference management software, and duplicates removed.
Stage Two: title and abstract reviewed to remove studies not meeting the inclusion criteria (see above).
Stage Three: manuscript review to remove studies that did not meet inclusion criteria; paper selection.
Stage Four: review of references of selected papers (from Stage Three).
Stage Five: final paper selection, data extraction, and quality assessment.

Data was extracted based on the specific points noted below and input into a standardised Excel database:
- study authors or agency, year
- study country
- setting: urban or rural
- population type (refugee, internally displaced, entrapped population, host population)
- humanitarian crises type (armed conflict or natural disaster)
- health outcome(s) addressed by the public health intervention
- type(s) of public health intervention
- study design
- measurement outcomes (e.g. prevalence, odds, ratios etc)
- target age group: i) infants: under 6 months, ii) infants and young children: under two years, iii) children under five: 6 months - 59 months, iv) school age children: 6 years - 15 years, v) adolescents: 10 years - 19 years, vi) adults: 20 years - 49 years, vii) elderly: 50+ years.
- quality of the evidence on specific interventions
- change in quantity of evidence over time
- change in quality of evidence over time
- research strengths from the literature
- research gaps from the literature
2.1.5 Data categorisation and analysis

Data analysis was conducted for each health topic separately, with findings organised in relation to the key issues of quantity and quality of the evidence base. To increase clarity of the final results, the studies selected at Stage Five were arranged into three main categories of evidence (Table 1):

<table>
<thead>
<tr>
<th>Category A:</th>
<th>Category B:</th>
<th>Category C:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studies that measure statistical associations between intervention and health-related outcome</td>
<td>Studies that measure changes in health-related outcome, but do not report statistical associations.</td>
<td>Outcomes not measured (e.g. outputs, processes, perceptions)</td>
</tr>
</tbody>
</table>

As indicated in Table 1, Categories A and B roughly correspond to evidence that is expected to be of high to moderate quality. Given the generally much weaker value of evidence in Category C, data extracted from studies classified as Category C was limited to the existence of the study alone.

The quality assessment of studies (Categories A and B) included in the systematic literature review were reviewed based upon criteria adapted from the STROBE and CONSORT standards for observational studies and clinical trials, respectively. The adaptations are outlined in Table 2 and scoring levels given in Table 3.
2.2 Systematic literature review on contextual factors

The aim of this review was to conduct a systematic evidence review of the quantity and quality of evidence on the influence of contextual factors on public health interventions in humanitarian crises. Again, the methodology and reporting adheres to the PRISMA statement.

Contextual factors are taken here to mean the physical, political and social characteristics of the environment that are related to the effectiveness of humanitarian intervention. The six contextual factors are given below:

**Access to healthcare:** This encompasses both the access that end-users have to healthcare as well as the access that healthcare workers have to end-users. Accessibility of healthcare to end-users will specifically include the four overlapping dimensions of (i) Physical accessibility, (ii) Economic accessibility, (iii) Informational accessibility, and (iv) Non-discrimination. Accessibility for workers to provide healthcare to end-users will include the dimensions of (i) Physical accessibility, (ii) Economic accessibility, and (iii) Political accessibility.

**Health assessment methods:** This will look for studies specifically seeking to test, develop or validate measurement methods (e.g. mortality estimation, population estimation, nutritional assessment etc.).

**Coordination:** The quality of coordination and leadership in the implementation of public health interventions during humanitarian crises at the local, regional or international level via local or OCHA-led mechanisms influences their impact. In addition to the logistical aspects of coordination, the effects of competition among local and international agencies for funding and recognition, and the lack of consensus on which public health actions are considered humanitarian and which are considered developmental will also be included.

**Accountability to end-users:** The Humanitarian Charter emphasises the importance of accountability of agencies to crisis-affected populations. Accountability will include the following dimensions based on a human rights-based approach to health: (i) Availability of functioning public healthcare facilities, goods and services in sufficient quantity, with sufficient capabilities, and in a timely manner; (ii) Acceptability of public healthcare facilities, goods and services in terms of medical ethics and cultural appropriateness; and (iii) Quality of public healthcare facilities, goods and services that are scientifically and medically appropriate and of good quality, and using trained and skilled personnel adhering to accepted professional standards.

**Security of healthcare workers:** Closely related to contextual factor 1 above (in particular the political dimension influencing the access of healthcare providers to end-users), both the interest in and the corpus of literature available on the specific issue of security of healthcare workers in humanitarian crises call for the study of this as a distinct contextual factor in this review. It will include influences which secure the respect of healthcare interventions as off-limits to deliberate attack and disruption, and those which make it conducive to hold humanitarian health action hostage (e.g. attacks on polio workers in Pakistan and Nigeria). It will also include strategies used in humanitarian health diplomacy relevant to the security of healthcare workers.

<table>
<thead>
<tr>
<th>Level of Quality</th>
<th>Rating of Evidence per STROBE / CONSORT</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH</td>
<td>7-8 criteria met = high quality evidence</td>
</tr>
<tr>
<td>MODERATE</td>
<td>4-6 criteria met = moderate quality evidence</td>
</tr>
<tr>
<td>LOW</td>
<td>1-3 criteria met = low quality evidence</td>
</tr>
</tbody>
</table>
Urbanisation: Rapid global urbanisation, particularly in low- and middle-income countries, means that humanitarian crises are increasing likely to affect populations in urbanised settings. At present, the similarities and differences between the strategies and processes leading to effective public health interventions in humanitarian crises occurring in rural and urbanised environments is grossly understudied. These will be included in the analysis of this contextual factor as well as the identification of characteristics that are particular to the urban environment in terms of the physical, mental and social health challenges this setting poses to crisis-affected populations.

2.2.1 Key terms
The key terms are as given above in Section 2.1.1.

2.2.2 Search strategy and search terms:
This literature review focuses solely upon peer-reviewed literature. Relevant studies have been located using electronic bibliographic databases such as Medline, Embase, Global Health, International Bibliography of the Social Sciences (IBSS), PsychINFO, and Web of Science. The exact search terms depend on individual database but include:
- terms related to humanitarian crises
- AND terms related to lower and middle income economies
- AND terms related to each of the six contextual factors above

Peer reviewed literature research reports produced by the UN agencies were also included. These were sought from the relevant agency websites. In addition, expert consultation and a review of the reference lists ('references of references') of selected articles were used to locate other relevant papers.

2.2.3 Inclusion/exclusion criteria
The following seven inclusion criteria were used for this review:
- **Types of studies:** Primary quantitative and qualitative research published studies will be considered.
- **Populations of interest:** Populations affected by humanitarian crises in low and middle-income receiving humanitarian assistance, as defined by The World Bank.
- **Health outcomes of interest:** Primary outcomes (e.g. morbidity, mortality, vaccination status), secondary outcomes (e.g. contraceptive prevalence rate), and primary outputs (e.g. malaria bed nets distributed, nutrition supplements provided etc).
- **Crisis Phase:** Studies that cover the acute or chronic humanitarian crises, or early recovery phases of humanitarian crises.
- **Data type(s):** Must include primary data collection.
- **Date of intervention / publication:** January 1, 1980 – December 31, 2012.
- **Publication language:** English, French.

The following four exclusion criteria were used for this review:
- Studies that do not directly link the specific contextual factor with health outcomes or outputs.
- Studies that examine preparedness and resilience not linked to health outcomes in humanitarian crises (e.g. studies on housing fortification before flooding).
- Studies that focus on post conflict and post disaster reconstruction.
- Review papers; only the references of review papers were screened to find more primary data sources.


2.2.4 Study screening and data extraction:
The evidence review of contextual factors was led by Vera Sistenich and colleagues at Harvard University. For quality assurance, a secondary peer reviewer corroborated paper screening and data extraction.

Data was screened per the following five stages:

**Stage One:** electronic database search using terms provided above and in Appendices 1-7; number of results to be recorded and downloaded into an Endnote file (one per contextual factor), and duplicates removed.

**Stage Two:** title and abstract review to remove studies not meeting the inclusion criteria (see above).

**Stage Three:** manuscript/report review to remove studies that do not meet inclusion criteria.

**Stage Four:** review of references of references (taken from papers reviewed in Stage Three)

**Stage Five:** final paper selection, data extraction, and quality assessment.

Data was extracted based on specific research points noted below and input into a standardised Excel data extraction form:
- study authors/agency, year
- study country
- study population type (refugee, internally displaced, entrapped population, host population)
- humanitarian crises type (armed conflict or natural disaster)
- humanitarian crises stage (i.e., preparedness, acute crises, stabilised, early recovery)
- type of public health interventions
- main aspect(s) of contextual factor influencing impact of health intervention
- interventions influenced by contextual factor
- character of contextual factor influence
- study design
- stratification (by age and/or gender)
- use of recognised guidelines for public health intervention
- quality of the evidence on specific interventions
- change in quantity of evidence over time
- change in quality of evidence over time
- research strengths from the literature
- research gaps from the literature

2.2.5 Data categorisation and analysis:
Data analysis was conducted for each contextual factor separately, with findings organised in relation to the key issues of quantity and quality of the evidence base.

As noted above, the quantitative studies selected at Stage Five were arranged into the three main categories of strength of evidence (A, B, C). The quality of the quantitative evidence on contextual factors was also assessed using the STROBE standards for observational studies (see Table 2) (as no clinical trials will have been conducted on these contextual factors). The quality assessment of qualitative studies on contextual factors was conducted using an adapted version of the RATS guidelines for qualitative research review. The key quality criteria of RATS are shown in Table 4.
The quality review of the qualitative studies was also graded studies based upon their overall quality. This grading is shown in Table 5.

### Table 4: Quality review criteria (adapted from RATS)

<table>
<thead>
<tr>
<th>Relevance of study question:</th>
<th>1. Is the research question explicitly stated?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriateness of qualitative method</td>
<td>2. Is the study designed described and justified by the authors?</td>
</tr>
<tr>
<td>Transparency of procedures:</td>
<td>3. Are the characteristics of the study group and setting clearly described?</td>
</tr>
<tr>
<td></td>
<td>4. Was ethics approval cited?</td>
</tr>
<tr>
<td>Soundness of interpretative approach:</td>
<td>5. Was method of reliability check described and justified? For example, development of research of research instruments, translation, data analysis.</td>
</tr>
<tr>
<td></td>
<td>6. Are the strengths and limitations explicitly described and discussed?</td>
</tr>
</tbody>
</table>

#### Table 5: Study categories and their relative correspondence to quality criteria

<table>
<thead>
<tr>
<th>Level of Quality</th>
<th>Rating of Evidence per RATS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Category A:</strong></td>
<td>High</td>
</tr>
<tr>
<td>Studies that address 5-6/6 of all RATS guidelines</td>
<td></td>
</tr>
<tr>
<td><strong>Category B:</strong></td>
<td>Moderate</td>
</tr>
<tr>
<td>Studies that address 3-4/6 of all RATS guidelines</td>
<td></td>
</tr>
<tr>
<td><strong>Category C:</strong></td>
<td>Low</td>
</tr>
<tr>
<td>Studies that address 0-2/6 of all RATS guidelines</td>
<td></td>
</tr>
</tbody>
</table>

### 2.3 Expert interviews

The aim of the expert interviews was to utilise expert opinion to identify critical weaknesses and gaps in the evidence base for humanitarian public health actions (including on contextual factors) in order to recommend priority areas for further research.

#### 2.3.1 Design and implementation

The expert interviews were semi-structured in design. Participants were approached by email or telephone, with an information sheet and consent form provided in advance of the interview. The individual interviews were led by the individual project staff member leading the research on that particular health topic or contextual factor. They were conducted by telephone/Skype and were held in English or French. The interviews lasted between 30 and 60 minutes. In addition, a series of face-to-face individual or group expert interviews were held in London, Geneva, and Paris (with meetings in Washington and New York taking place in late May/early June). Written notes were taken during the interviews. The topic guide used for the interviews focused upon: (i) the use research in their organisation, (ii) the main guidelines and frameworks that guide interventions and associated research, (iii) the main evidence gaps and research needs, and (iv) recommendations for future research questions.
In addition, to help validate and prioritise the study findings, the preliminary findings and recommendations from the expert interviews and systematic review were then shared by email with the experts, and they were asked to give their additional perspectives on the findings and their prioritisation of the recommendations.

2.3.2 Participant sampling
Participants for the semi-structured interviews were experts and practitioners in the field of humanitarian health. They were purposively selected based upon their expertise using a mapping exercise of key personnel and agencies in the humanitarian health field, based upon their own knowledge, contacts and also through the literature. Additional participants were selected based upon suggestions from participants.

The participants were practitioners, policy makers or researchers working in the field of humanitarian public health with humanitarian NGOs, United Nations agencies, donor agencies, government agencies, and research institutes and universities. Please see Annex 11 for details of the participants.

2.3.3 Data analysis
Data analysis was conducted for contextual factor separately, with the findings organised in relation to the structure of the topic guide. Thematic analysis was then used to identify the key themes emerging from the data. The analysis was then adjusted after feedback from the experts on the preliminary findings.

2.3.4 Ethical issues
All interviews were fully confidential and anonymous. All data are securely stored and password protected. Ethics approval for the project was provided by the Ethics Committee of the London School of Hygiene and Tropical Medicine.
3. Overview of results

3.1 Quantity

Research on the effectiveness of health interventions in humanitarian crises has significantly increased during the last decade, with 76% of the 706 studies selected in the systematic review published between 2000 and 2012 (Figure 2). However, considering the diversity of crises, contexts and health care needs where humanitarian actors intervene, the volume of evidence available remains globally too limited. Health topics of gender-based violence (GBV) and water, sanitation and hygiene (WASH) had a particularly limited evidence base with only 3 and 8 studies respectively (Figure 3).

![Figure 2: Total number of papers, by decade](image)

![Figure 3: Total number of papers, by health and contextual topic](image)
3.2 Quality
The quality of studies on the effectiveness of health interventions in humanitarian crises remain generally low to
moderate with a very limited number of high quality studies in every field. Only 60% of the studies were rated
moderate to high. However, the quality of research has significantly improved during the last decade with 80% of
the studies were of being of moderate to high quality. However, the quality of studies have remained relatively low
between 2000 and 2012 for research on sexual and reproductive health, health service delivery, and health systems.

3.3 Ranges of effectiveness
The research gaps identified in every health topic can be classified in three different groups (Figure 4). In areas
such as GBV and mental health and particularly psychosocial support, more evidence is needed to understand
the effectiveness of interventions (i.e. whether the intervention actually works). In a second group (injury and
rehabilitation, WASH, NCD, SRH), evidence exists on what intervention work but research is needed on the most
effective way of delivering the health intervention. In a third group composed of nutrition and communicable disease
control, research needs to focus on both the effectiveness of some interventions and also the most effective way of
delivering other types of interventions.

![Figure 4: Range of effectiveness among health topics](image-url)
3.4 Common themes
Cross-cutting issues were identified of: systems and delivery, research methods, and contexts for research (Figure 5).

3.4.1 Systems and delivery
- The model of delivering health interventions has been highlighted by most experts. Research is needed to test, measure and compare different models of health service delivery such as task shifting, community-based versus facility-based services.
- The fragmentation of humanitarian aid has created silos in the health sector and also with other sectors (e.g. education and protection). There is a need for interventions to create synergies between different health topics and with other sectors, and for researchers to then evaluate the health impacts of such interventions. Researchers should also initiate research that explores cross-cutting issues.
- More research is needed on understanding the most effectiveness way of building the capacities of local health services during humanitarian crises.
- Health systems resilience has increasingly emerged as a new topic of investigation. Research needs to explore how humanitarian crises affect local health systems and how local health systems adapt to or absorb crises.

3.4.2 Context
- The effectiveness of health interventions in humanitarian crises relies on the appropriateness of health interventions to local contexts. More evidence is needed on the impact of contexts (e.g. country income levels, capacity within health systems, epidemiology, security, societal organisation, cultural values etc) on the effectiveness of health interventions.
Continuity of care is a pressing issue that needs to be addressed by humanitarian organisations to ensure that patients who need long term treatment can get access to quality healthcare after the departure of humanitarian actors. This is increasingly prescient given the growing burden of chronic diseases and NCDs, particularly in middle-income settings.

3.4.3 Methods

- In most health topics, there is a lack of harmonisation of standards and medical protocols. Researchers could help test different protocols and standards. This in turn could contribute to improve coordination amongst humanitarian actors.
- More research is needed to develop, test and validate existing and new assessment methods (e.g. mortality estimation, population estimation, needs assessments, health service coverage and access).
- Greater research is required on cost-effectiveness of humanitarian public health interventions, including gaining a better understanding of the burden of disease within and between health topics.
- Greater use of baseline, and routine data to inform healthcare providers on the needs of populations and specific groups (e.g. children, elderly people or people with disabilities).
- There is also a need for greater use of high quality mixed methods research. For example, to help guide quantitative research, to help interpret quantitative findings, and to gain better insight on issues such as access, acceptability, and appropriateness of health interventions and research.
4. Results for Health Topics

4.1 Communicable disease control

4.1.1 Systematic review

- A total of 16,239 peer-reviewed articles related to communicable diseases (CD), of which the vast majority (16,153) either did not address humanitarian crises or the impact of an intervention. A total of 86 peer reviewed articles covering 124 interventions met the inclusion criteria.
- There was little available grey literature, of which none met the inclusion criteria.
- Slightly over half of the selected papers (47/86) included a test of statistical significance between CD interventions and health outcomes (category A). An additional 25 (25/86) papers measured CD interventions and health outcomes without a test of statistical significance (category B). A final 14 (14/86) papers simply reported interventions and only anecdotal relationships to outcomes (category C).
- The analysis presented below relates to the 72 category A and B papers.
- There has been increasing interest in CD interventions in humanitarian crises over the past two decades; 38 (53%) papers have been published since 2000. However, increased number of publications is not correlated with increased quality (Figure 6). Of the 72 category A and B papers, 34 out of 47 (72%) category A papers were deemed high quality and 13 (28%) were deemed moderate quality; no category A papers were deemed of low quality. Nineteen out of 25 (76%) category B papers were deemed to be of moderate quality, while six out of 25 (24%) papers were deemed to be of low quality; no category B papers were deemed high quality.
- Before and after (31/72, 43%) and cohort (24/72, 33%) designs were most common, followed by randomized controlled trials (9/72, 13%). Cross sectional (3/72, 4%), non random trials (3/73, 4%), and economic studies (2/73, 3%) were relatively uncommon in this sector. The majority of the study designs employed allowed for higher quality evidence, and for the ascertainment of outcomes over time (including response to the interventions under study).

![Figure 6: Quantity and quality of communicable disease publications over time](image)

- Most studies occurred in Africa (40/72, 56%), 16 (22%) were in South Asia, 10 (14%) in Southeast Asia, and 3 (4%) each in Latin America and the Middle East (Figure 7).
- Most studies occurred in armed conflicts (63/72, 88%); only 9 (9/72, 12%) occurred in natural disasters (Figure 8). Of those in conflict zones, 59% (37/63) were with refugees, 8% (5/63) with IDPs and 33% (21/63) with
the general population. Similarly, most (7/9, 78%) natural disaster studies were conducted with the general population, and 2 (2/9, 22%) were with refugees.

- Most (38/63, 60%) studies in conflict settings were conducted in camps, 19% (12/63) were in mixed urban/rural settings, 14% (9/63) in urban settings, and 6% (4/63) in rural settings. Of the 9 studies in natural disasters, 3 (33%) were in mixed urban/rural settings, 3 (33%) in rural settings, 2 (23%) in camps, and 1 (11%) in a rural setting.

- 18 different diseases were addressed (Figure 9). Tuberculosis (25/108, 23%) and malaria (22/108, 20%) each accounted for over 20% of the diseases addressed, followed by measles (17/108, 16%), cholera (7/108, 6%), diphtheria/tetanus/pertussis (6/108, 6%), polio (6/108, 6%), and diarrhoea (6/108, 6%), shigella (5/108, 5%), and meningitis (4/108, 4%). Dengue, dracunculiasis, leishmaniasis, leptospirosis, mumps, onchocerciasis, schistosomiasis, yellow fever were each researched only once. Pneumonia is considered one of the most important contributors to morbidity and mortality in these settings and populations, but no paper explicitly addressed interventions against pneumonia.

- The 72 studies in categories A and B covered 108 interventions (Figure 10). Of these, the most popular intervention type was on vaccination (39/108, 36%). Directly observed therapy short course (DOTS) was employed in 15% (16/108) of the studies, with 5% of tuberculosis studies conducted in the pre-DOTS era (5/108). Other interventions included antimalarials (8/108, 7%), oral rehydration (7/108, 6%), insecticide-treated nets (5/108, 5%), antihelminths (3/108, 3%), indoor residual spraying (3/108, 3%), and insecticide treated sheets (3/108, 3%). Environmental spraying of insecticide, BCG vaccination, and sodium stibogluconate were researched in two studies each and, cloth filters, DEET, and zinc were used in one study each.
Most (57/72, 79%) of the studies were in the acute crisis stage, 9 (13%) were in the stabilised stage, and 6 (8%) in the early recovery stage (Figure 11). No studies were conducted during the preparedness stage.

Figure 9: Communicable disease, by disease

Figure 10: Communicable disease, by intervention

Figure 11: Communicable disease studies by stage of crisis
4.1.2 Expert interviews

Key findings from the expert interviews were as follows:

- Compared to other sectors (e.g., WASH, nutrition), the CD sector is more diverse, leading to problems when CD practitioners try to coordinate interventions and research – particularly with other sectors.
- The two largest problems facing CD research in these settings are: i) lack of coordination in response, ii) lack of consensus on standards to employ for each situation.
- Context is very important and further research is needed, for example, on how vaccinations schedules should be reconsidered per each population and crisis type (by situation, partners on the ground).
- As a sector, CD follows norms and guidelines – most notably Sphere, but individual agencies have their own guidelines and protocols, causing problems, e.g., the NATO response in Afghanistan had joined forces from different countries, meaning over 10 different malaria protocols were being used at the same time, in the same region.
- Sphere’s CD indicators are not easy to measure for those practicing in the field. This has also led to a divergence of indicators, with several organisations developing their own (e.g., CDC, NGOs).
- WHO agencies need to take more leadership in this sector, as there is currently no single authoritative body to which CD practitioners defer. Experts agree this was, in theory, supposed to be the WHO but there is little guidance, which leads to each agency working more in isolation.

Evidence gaps identified by key informants included:

- The evidence base for CD interventions in crisis settings needs to be strengthened, starting with development of protocols and indicators on which everyone has consensus, e.g., Sphere indicators must be reframed into something context-specific.
- Specific evidence gaps exist around many issues related to communicable disease, including: the diseases themselves (e.g., pertussis, hepatitis A and E, and measles), methods to measure them (e.g., Lot Quality Assurance Sampling (LQAS)), and standard measurements such as mortality (e.g., age and gender specific).
- Designs to conduct and assess immunisations are problematic, with LQAS being employed by many but debated by a few experts who question its appropriateness.
- CD is context, disease, and crisis specific – e.g., currently there is almost no evidence on CD control in Syrian populations; age/gender specific information is needed, even on mortality.
- Surveillance must be enhanced across all settings, once indicators are agreed upon; current surveillance focuses on measles but target ages are changing and schedules being revised.
- There is no evidence on whether a coordinated humanitarian approach will improve targets; research could be done on current versus coordinated approaches.
- Huge gap in understanding of human side of CD control; more anthropological/sociological research is needed for CD intervention success (e.g., acceptability).
- Research could validate clinical versus laboratory confirmed outcomes for CD interventions.

4.1.3 Recommendations for future research

Disease-specific gaps

- Specific evidence gaps exist around many communicable diseases such as pertussis, hepatitis A and E, or measles.

Indicators, standards, and guidelines

- The CD sector has felt a lack of uniform agreement in the area of using protocols to direct interventions, and indicators to measure their impact; research should be conducted on how to best standardise both for the CD community in crisis settings.
The evidence base for CD interventions in crisis settings needs to be strengthened, starting with development of protocols and indicators on which everyone has consensus, e.g. Sphere indicators must be reframed into something context-specific.

Better standard measurements are needed for mortality (e.g. age and gender specific) data.

Study design

- Research could help validate syndromic diagnoses versus laboratory confirmed outcomes for CD interventions.
- New measurement methods should be considered, e.g. for assessing immunization coverage.
- More anthropological/sociological research is needed for CD intervention success (e.g. acceptability, accessibility).

Contextual factors

- Increasing urbanisation and movement to coastal areas means that more attention should be given to CD research in humanitarian contexts in these settings, including disease movement to and from these population areas.

References (A and B categories): Communicable disease control

5. Arumugam, M., et al., Measles transmission following the tsunami in a population with a high one-dose vaccination coverage, Tamil Nadu, India 2004-2005. BMC Infectious Diseases, 2006. 6(143).
44. Myint, N.W., et al., Are there any changes in burden and management of communicable diseases in areas affected by Cyclone Nargis? Conflict and Health, 2011. 5(9).
4.2 Water, sanitation and hygiene

4.2.1 Systematic review

- Of available peer-reviewed articles related to Water, sanitation and hygiene (WASH) (3963), the vast majority (3955) either did not occur in humanitarian crises or did not measure the impact of WASH interventions. Studies that measured the impacts of WASH interventions on water quality/purity (e.g. faecal coliform or residual chlorine levels) rather than health related outcomes (e.g. diarrhoea) were excluded.

- Only eight peer reviewed papers met the inclusion criteria. The majority of selected papers (6/8) conducted a test of statistical significance between WASH interventions and health outcomes (category A). One reported WASH interventions and health outcomes without a test of significance (category B), while another (1/8) simply reported the number of water treatment packets sold but only anecdotally mentioned in relation to cholera seasonal peaks (category C).

- The analysis presented below relates to the seven category A and B papers.

- Of these seven category A and B papers, three out of six category A papers were deemed high quality and three out of six category A papers were deemed moderate quality. The only category B paper selected was deemed to be of moderate quality.

- There has been increasing interest in WASH interventions in humanitarian crises over the past two decades, with 6/7 papers published since 2000; however, increased number of publications is not correlated with increased quality (Figure 12).

- Controlled before and after designs were most common (3/7), followed by randomised controlled trials (RCTs) (2/7), case-control (1/7), and non-random trial (1/7) designs. Of the few WASH interventions selected, the majority of designs yielded higher quality evidence.

![Figure 12: Quantity and quality of WASH publications over time](image-url)
Five of the seven studies occurred in armed conflicts and two in natural disasters (Figure 13). Of those in conflict zones, three were with IDPs and two with refugees. Both natural disaster studies were conducted in the general population.

Six of the seven studies were in Africa and one in Latin America (Figure 14).

All seven studies assessed the impact of WASH interventions on diarrhoeal diseases (Figure 15), with five on general diarrhoea, one on a cholera outbreak, and one on in a suspected – although not laboratory confirmed – Shigella outbreak.

The seven WASH studies covered 14 different types of interventions (Figure 16). The two most popular intervention types were safe water storage (N=4) and point of use treatment (N=4), of which the majority of the latter used some sort of disinfection (e.g. flocculent). Other interventions included WASH education (N=2), hand washing (including soap distribution) (N=2, latrine provision (N=1), and point of source disinfection (N=1).
Most of the studies occurred in the crisis stage (4/7), followed by early recovery (2/7), and with one study conducted during both the acute crisis and early recovery stages. Preparedness was not in any of the papers reviewed (Figure 17).

4.2.2 Expert interviews

**General comments**

- Compared to other humanitarian sectors, WASH is fairly well organised within its sector and there seems to be good cooperation and coordination across the various actors (NGOs, extra-governmental, and governmental agencies).
- However, the WASH sector has a concentration of engineers and non-health professionals; therefore, the link with health outcomes is currently weak and there is a lack of guidance in how WASH can link with other sectors (notably infectious diseases and nutrition).

**Study design**

- Thus, the majority of current WASH interventions have been weak in terms of design and evaluation – future interventions should be reproducible, rigorous, and have clear objectives.
- WASH as a sector does not tend to do RCTs, with some questioning whether RCTs are necessary given that many WASH activities (e.g. hand washing) are considered good practice and common sense via years of programmatic experience.
- WASH is typically first or second line response in a disaster, leaving little time to plan how to design good studies (and there is little guidance to do so).
- Economic studies are also needed as there is a great difference in cost (and benefit) between various WASH interventions (e.g. latrine construction vs. soap provision).

**Indicators, standards, and guidelines**

- As a sector, WASH follows norms and guidelines – most notably Sphere. However, Sphere’s WASH indicators are not easy to measure for those practising in the field, which has led to a divergence of indicators, with several organisations developing their own.
- Furthermore, as WASH professionals generally have engineering backgrounds, WASH interventions (if evaluated) are judged by water quality/treatment indicators (e.g. residual chlorine) due to the consensus and acceptability of their standards.
There is a belief amongst some WASH professionals that water quality variables (with their agreed-upon standards) are more reliable and therefore a better measure of success than many health outcomes, especially those health outcomes that are not laboratory confirmed (e.g. self-reported diarrhoea).

**Importance of intersectoral and multidisciplinary research**

- Certain types of WASH responses (e.g. latrine provision) are costly and require massive planning. Given the unstable nature of many crisis-affected environments, designing studies was considered challenging, but there is a definite desire to quantify how well such interventions work – alone and with the interventions of other sectors.
- In the early 2000s, WASH as a sector realised it could not simply focus on distributing and installing goods (e.g. latrines) without considering cultural, behavioural, and contextual factors and there was recognition that research is needed to better understand issues such as acceptability and to create context-specific approaches. Behavioural (anthropological, sociological) research is crucial for the success of interventions as WASH practices (and their acceptability) are so culturally specific.
- There may be great potential to draw lessons from stable settings where longer-term approaches have been implemented and tested.

**Evidence gaps identified by key informants included:**

**Specific research gaps**

- The evidence base for WASH interventions needs to be strengthened; for instance, the evidence on interventions for some health outcomes is extremely limited (e.g. hepatitis E) or lacking in evidence compared to that of other sectors (e.g. cholera). This is not to say there is not value in these interventions, but their benefits have not been quantified.
- In addition to further research on transmission, risk factors, and intervention effectiveness; cost studies could help establish what interventions to prioritise, depending on concurrent factors (e.g. rate of migration) across settings.
- More evidence is needed on how WASH, infectious diseases, and nutrition relate; it is difficult for WASH interventions to show impact without linking to health outcomes.
- Behaviour change research is crucial, especially among previously understudied populations (e.g. in Syria and Middle-East more broadly).

**Operationalising research**

- It is unclear who should be charged with evaluating WASH interventions – e.g. the UN, a consortium, or an independent research body? There is a lack of leadership in this area, making impact evaluation very difficult – especially when multiple interventions across many sectors are targeting the same populations.
- While WASH interventions are often first or second line responses, little has been established about their added benefit alongside other types of interventions (e.g. vaccination).
- WASH experts also expressed consensus on the need for coordination (within and across sectors, and within organisations) on impact evaluation.
4.2.3 Recommendations for future research

**General comments**

- The WASH sector has felt a lack of guidance in the area of measuring the impact of interventions. More assistance (e.g. epidemiological) and coordination must occur, particularly to support WASH interventions being linked to health outcomes. Research should be conducted on how to best foster such collaboration so that future interventions can be assessed in a meaningful way.

**Study design**

- More research is needed on WASH behaviour change interventions, particularly with less studied populations (e.g. those from new crises in Syria and Middle-East more broadly).
- Research is needed on what study designs (other than RCTs) may provide useful results for WASH and health professionals; RCTs may not be feasible given the sector and certain settings, so in some cases other designs – including economic studies – may be more appropriate.
- The design of studies in WASH needs to be improved.
- Economic and anthropological research is needed; what level of success is acceptable to communities, governments and other actors in relation to health effects seen as well as money spent?
- Priority should be given to the lack of coordination in humanitarian response.

**Indicators, standards, guidelines**

- Sphere indicators are important but difficult to measure in practice. A review of Sphere indicators in the WASH sector is needed. Without good indicators it is impossible to know how well the interventions have been working in relation to acceptable levels (e.g. diarrhoea) given a setting, population, and specific disease (e.g. Shigella vs. cholera).

**References (A and B categories): Water, sanitation, and hygiene (WASH)**


4.3 Nutrition

4.3.1 Systematic review

- Seventy-seven papers were selected out of 2535 published papers searched; Twenty-two papers were included from grey literature.
- Nearly half (35 papers) of papers were from the 'A' category of evidence, 24 papers were category B, 18 papers were category C.
- There is increasing interest in evidence based-intervention in humanitarian crises, with 70% of all studies conducted since 1980 being published in the last decade. Furthermore, the proportion of high quality papers increases over time (Figure 18). Most papers were of moderate quality (34/77), a quarter were of high quality (18/77) and a third of low quality (25/77). In category A, 18 papers were of high quality, 27 were moderate and 1 out of 46 was of low quality whereas no paper was of high quality in category B, eight were moderate and 23 out of 31 were of low quality.

The majority of studies employed a cross-sectional design (29 papers), a third used follow-up/monitoring data of beneficiaries enrolled in programmes (27 papers), several studies were of cohort and RCT design (nine and six papers respectively), and the rest were cost-effectiveness, mix-method and case control studies (3%, 4% and 1% respectively).

The majority of studies were conducted in Africa (72%), a fifth in Asia (18%) and few in Europe, Middle-East and Caribbean (4%, 3% and 1% respectively) (Figure 19).

Half (37 papers) of the studies assessed were during an armed conflict, a third (26 papers) responded to a natural disaster and a fifth (15 papers) were in zones affected by both type of emergencies (Figure 20).

Half (40 papers) of the studies were conducted during acute humanitarian crises, more than a third (30 papers) in stabilised context, 5 (6.5%) where in place before emergency (preparedness) and 2 (2.6%) were including different stages of emergencies.

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Figure 18: Quantity and quality of nutrition publications over time
Intervention assessed were mainly addressing micro-nutrient deficiencies and the treatment of Severe Acute Malnutrition (SAM) (18 and 16 papers respectively). Several were Targeted Supplementary Feeding Programmes (TSFP), Blanket Supplementary Feeding Programmes (BSFP) and General Food Distributions (GFD) interventions (11, 8 and 8 papers respectively). Only four studies examined Infant and Young Child Feeding (IYCF) practices (Figure 21). The health outcome of more than half the studies (41 papers) was acute malnutrition followed by micro-nutrient deficiencies (24.7%), of which anaemia was mainly examined (76.5%). Several studies examined chronic malnutrition (15.6%) (Figure 22).
Interventions addressing micro-nutrient deficiencies, GFD, TSFP and the treatment of SAM have been assessed since the end of the 1980s/early 1990s. The diversity of type of interventions studied increased over time. Publications on (IYCF) interventions were published only from 2003 and micro-finance and voucher (in "other" category) from 2005. All preparedness interventions were BSFP and their assessments were published after 2008 (Figure 23).

4.3.2 Expert interviews

4.3.2.1 Priority gaps

Impact assessment and Monitoring and Evaluation (M&E):
- Gaps exist in how sensitive and effective assessment methods are, how well surveillance methods perform, and on the impact of interventions.
- Better monitoring and evaluation (and better of use of related data) is needed for to improve the quality of nutrition programmes.
- A considerable amount of data exists but is not analysed and is poorly managed. In many organisations, data collected is not centralised or organised.

Targeting specific groups:
- Some vulnerable groups are left out: Infants-under six months, the elderly and people with disabilities. Little is done to i) identify/detect these groups, ii) design appropriate protocols/interventions, and iii) integrate within other routine programmes.

Infant and Young Child Feeding (IYCF):
- There are huge gap in IYCF although there is more emphases today with Scaling Up Nutrition (SUN) movement.
Prevention/management of Moderate Acute Malnutrition (MAM):

- Information to support the prevention and management of moderate acute malnutrition should be prioritised.
- There is too much focus on acute malnutrition and not enough on stunting.

Treatment of SAM:

- Coverage and early detection should be prioritised.
- Little is known on long-term effects of Ready to Use Foods (RUF).

4.3.2.2 Issues related to context and type of crisis

- More information is needed on nutritional needs in urban areas/slums (including support on methods given the challenges of sampling and conducting surveys).
- Aetiology of malnutrition is different in urban areas (social context, access to care).
- Emergencies in middle-income countries and/or where Global Acute Malnutrition (GAM) prevalence is low are very different and require different approaches.

4.3.2.3 Type of study needed

- All designs, including mix-methods approaches, should be used.

4.3.2.4 Use of guidelines and standards

- Sphere guidelines are used to assess nutrition programme performances and most organisations refer to best practices research method such as CONSORT or STROBE but many organisations have their own technical research policy and understanding and way of use guidelines.

4.3.2.5 Is there consensus on research gaps?

- Although most experts have their specific agenda (i.e. particular target group) there seems to be a consensus on evidence gaps on: i) IYCF interventions, ii) MAM and stunting, iii) tools for M&E and more M&E, and iv) context specific intervention.

4.3.3 Summary of recommendations for future research

Context:

- Need to better understand the aetiology of malnutrition and famines in different contexts (e.g. urban areas).
- Need more analysis of the impact of contextual factors on famine and malnutrition (e.g. anthropological studies on the power of women in society).
- Need evidence to guide how to intervene in low GAM prevalence settings and/or in middle income countries.

Impact assessment:

- Need to test different monitoring tools, techniques, and new technologies to measure progress and impact of nutrition programmes.
- Need evidence on cost-effectiveness of nutrition interventions.
- Need evidence on impact of IYCF interventions.

Targeting specific groups:

- Focus on infants, people with disabilities, and the elderly.
Prevention/management of Moderate Acute Malnutrition (MAM):

- Search alternatives to BSFP (i.e. Cash transfer vs. RUF distribution, food security intervention vs. RUF). Is it appropriate in all contexts?
- Research on long-term effects of interventions (i.e. long-term effects of blanket distribution of lipid based supplement); need to think about double burden of malnutrition
- Research focusing on stunting.

Treatment of SAM:

- Health service delivery: what is the most effective way of delivering nutritional programmes? For example, community health workers or health facilities (i.e. research on Community Case Management (CCM))?  
- Long-terms effect of RUF on anthropometric status, cognitive development, risk of relapse etc.

Note: These recommendations are also in line with some of the recommendations identified by the authors of the Lancet series on Maternal and Child Nutrition in June 2013 (although non emergency context specific) such as the need for evidence: i) on long-term benefits of breastfeeding on nutritional and developmental outcomes, ii) on the effectiveness of complementary feeding strategies, iii) for prevention and management strategies for moderate acute malnutrition in population settings, especially in infants younger than six months, iv) and on innovative delivery strategies.

References (A and B categories): Nutrition


### 4.4 Sexual and reproductive health (including gender-based violence)

#### 4.4.1 Systematic review

- Total papers: Thirty-one papers were selected out of a total 7149 of papers searched. No papers were from grey literature. 27/31 (87%) studies focused on SRH interventions, 3/31 (10%) evaluated a GBV-related intervention, and 1/31 (3%) evaluated a combined SRH and GBV management intervention. Overall and disaggregated analyses of SRH and GBV interventions are presented below (Figure 24 and Figure 25).

#### Figure 24: SRH and GBV outcomes described in studies

- SRH: Reduced maternal and/or newborn mortality
- SRH: Improved HIV/AIDS and/or other STIs management
- SRH: HIV/AIDS prevention (awareness raising)
- GBV: Improved mental health
- SRH: HIV/AIDS prevention (awareness raising)
- SRH: Improved HIV/AIDS and/or other STIs management
- SRH: Reduced maternal and/or newborn mortality

#### Figure 25: SRH or GBV interventions

- SRH: FP and/or abortion access
- SRH: Emergency obstetric care improvements/provision
- SRH: Malaria prevention in pregnancy
- SRH: Economic analysis
- SRH: Breast feeding support
- SRH: Literacy / health education
- GBV: Psychosocial support
- SRH: HIV/AIDS management and/or prevention
- SRH: Health system strengthening and/or capacity building
Quality of evidence: There was a wide range of quality of evidence. The majority of studies provided low/moderate strength evidence, with 12/31 (39%) low, 15/31 (48%) moderate, and 4/31 (13%) high quality. High quality studies were implemented between 2006-2013. See Figure 26 and Figure 27.

Evidence categories: Among A category papers: three were scored as high, seven medium. Among B: one scored as high quality, seven medium quality, and eight low quality. Among C: zero scored as high, one medium, four low quality.

Study types: 13 cross-sectional, nine controlled before/after, three cohort, three randomised controlled trials (RCT), one case-control, one economic analysis, and one lesson learned.

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Figure 26: Quantity and quality of SRH/GBV publications over time

Figure 27: SRH/GBV studies by quality of evidence and health outcomes
- Regions: Twenty-two studies from armed conflict settings in Africa, eight from Asia, one from a natural disaster in the Caribbean/Latin America region (Figure 28 and Figure 29).
- Setting and stages of crisis: The majority of studies took place in armed conflict settings (80%) (Figure 29). Five studies from the acute stage of the crisis, nine from the early recovery stage, 17 from the stabilized period (Figure 30).

Figure 28: SRH/GBV studies by geographic region

Figure 29: SRH/GBV studies by crisis type

Figure 30: SRH/GBV studies by crisis stage
4.4.2 Expert interviews

Key Findings for SRH:

- Research is used to inform the design of interventions when possible but staff faced many barriers including limited access to peer-reviewed publications and prohibitively high costs for obtaining articles.
- Operational data is regularly collected which could be more effectively used.
- More research is needed during the transition phase (acute to chronic and protracted crisis).
- Given the social implications inherent in providing SRH services, context specific evidence is needed on how to make services and service delivery more responsive to people’s needs, which bear in mind values, attitude, behaviours, and contextual realities.
- Research, including the use of trials, is needed which can show causation and direct impact of an intervention on a given health outcome.
- The most commonly cited guidelines in use included Sphere, the MISP, and the IAWG Field Manual. Some organisations developed their own guidance based their organisational experience, the aforementioned guidelines, and the WHO guidance.

Key Findings for GBV:

- Research on primary and secondary GBV prevention programming is needed at all phases of a crisis. There is limited research at protracted/early recovery stages but even less at the acute and chronic stages.
- Current guidelines for GBV-related interventions are based on programmatic experience and evidence from developed and stable country settings. Numerous guidelines exist but are not systematically implemented and none have been evaluated.
- Evidence on health service needs for survivors of violence exist but there is no evidence on the impact in emergencies of other prevention and response interventions (i.e. case management for survivors of violence, psychosocial interventions, or risk reduction through interventions such as cash transfers, or community-based medical care). All of these interventions are based on evidence from stable country settings, not crisis settings.
- Most organisations in crisis settings do not have the research capacity or the funding to design, collect, analyse and disseminate research findings. Operational data and research from local NGOs is useful for service planning but are not designed or powered to assess impact. Rigorous research designs are needed which are implemented from an early stage.

4.4.3 Recommendations for future research

Research recommendations for SRH:

- More research was needed on the most effective means of service delivery in crisis settings rather than on the efficacy of interventions that have been proven in other settings.
- Qualitative and context specific behaviour and attitude research on people’s preferences is needed.

Particular research questions include:

- Profiling people and SRH needs in emergencies: What are the SRH needs of people in emergencies? Are they the same for the host population or global profile? Do services offered match needs?
- Specific sub-populations: What is the effectiveness of interventions that target previously excluded populations (e.g. people with disabilities, men, adolescents)?
Service delivery and scaling-up interventions:
- What are the mechanisms through which effective services and interventions can be scaled up?
- What are effective delivery models (e.g. facility- or community-based care) for emergency settings?
- How can task shifting be used to increase service delivery?
- How can we effectively involve community members in these interventions?

Technologies: use and development:
- How effective are new technologies (e.g. non-pneumatic anti-shock garments) at improving health and survival, how are they being used, and how should they be used (development of new guidance)?
- How and how frequently are currently available commodities being used in emergencies? (e.g. how frequently is each component of the safe birthing kits being used? And how can they be made more efficient? How and for what purpose is Misoprostol being used?)

Family planning: How is long acting reversible contraception (LARC) used in humanitarian settings? What are the behaviours, attitude and logistical barriers to family planning use? Do people receive sufficient appropriate information? What are the implications for future reproductive health (e.g. removal of IUS/IUD/implant) in the absence of availability of long-term health care?

Pregnancy and management of complicating conditions: What is the best way to manage conditions like (pre-) eclampsia or cholera to improve maternal and/or neonatal health outcomes?

Safe abortion services:
- How do we effectively address abortion practices in emergency settings, including the provision of safe abortion and post-abortion care?
- How is Misoprostol being used in non-controlled settings and what are the associated changes in health? Is the existence of an underground/informal economy creating conditions where women are likely to take too much or too little Misoprostol, and therefore suffer ill-health?

Delivery:
- In facility settings, how common are manual deliveries, episiotomies, vacuum assisted deliveries, and C-sections?
- Are C-sections being over utilised and/or conservative methods of assisted delivery under-utilised? What are the implications for future pregnancies or deliveries?

Research recommendations for GBV:
- Overall, there is no strong evidence on what interventions (stand alone/short-term or comprehensive GBV service provision) effectively address the immediate and long-term impact of violence on physical and mental health of survivors. Importantly, evidence on successful primary and secondary prevention programming is lacking throughout all crisis phases.

Particular research questions include:

Spectrum and context of violence:
- What is the spectrum of violence against women, girls, men, and boys during a crisis? (e.g. sexual violence by a combatant, intimate partner violence, trafficking, forced marriage)
- How can programmes be adapted to address the different forms of violence and corresponding health needs?
- How does each phase of the crisis impact on each sub-populations’ unique vulnerabilities to different types of violence?
- Do other forms of GBV increase as a result of conflict-related violence? For example, does intimate partner violence or child abuse increase in recovery phase?
Targeted interventions and operational constraints:
- How can we ensure that GBV services and prevention programming do not miss the most vulnerable? (i.e., disabled, elderly, young girls, urban refugees)
- Medical provision can be implemented through various humanitarian actors but most do not have the resource capacity to deliver comprehensive care for survivors. What are the best ways to deliver and strengthen GBV and medical services in crisis settings? Does the provision of GBV interventions lead to increases in other health and social services? How can safe abortion, emergency contraception, family planning and STI treatment be provided safely and effectively to survivors, especially in contexts where survivors may be blamed, hurt or even killed?
- There is no evidence base to understand the effectiveness and long-term impact of interventions for sexual violence survivors in the early crisis stage. What programming is feasible and effective? What is the optimal timing for early intervention for improved long-term physical and mental health outcomes?

Accountability and use of guidelines:
- Current guidelines for emergency settings are based on programmatic experiences and development contexts. How effective (or harmful) are the guidelines at preventing cases of violence?
- How can we ensure that the revised IASC GBV guidelines are being implemented across the humanitarian clusters and they are effective?

Interventions to evaluate: A number of promising interventions are being implemented but their impact on preventing GBV has not been evaluated. What is the role of safe spaces for women/children? What effect do cash transfer or livelihood interventions have at preventing GBV? What are ways to reduce unaccompanied children and provide protection? Does the placement of a GBV specialist advisor in acute crisis settings enhance the delivery of GBV services across the humanitarian clusters?

Methodological development: The collection of violence prevalence data in the acute stage of a crisis is not always ethical or logistically feasible. What are alternative methodological approaches for understanding experiences of violence in the early crisis stages?

References (A and B categories): Sexual and reproductive health (SRH), including maternal health and gender-based violence


4.5 Mental health and psychosocial support

4.5.1 Systematic review

- The search strategy yielded 8740 results but only 69 met the inclusion criteria (all A and B categories).
- There is an increasing evidence base. The earliest identified study that met the inclusion criteria was from 1997 and the number of studies has increased steadily since then (Figure 31).
- Twenty-seven studies were with populations affected by natural disasters (12 earthquakes, 12 Tsunami, 3 floods).
Forty-two studies were with populations affected by armed conflict (6 with refugees, 8 with IDPs, and 28 with general populations). Of these 42 studies, 10 were in the acute crisis stage and the remainder in more stable and early recovery stages.

- Of the 69 studies, 10 were in urban settings, 13 in rural settings, 35 in both urban and rural, and 11 in refugee/IDP camp settings.
- Thirty-seven of the studies were with adults, and 32 with children and adolescents.
- Fifteen of the studies were scored as being of high quality (7-8/8), 37 moderate quality (4-6/8), and 17 low quality (1-3/8). There is some indication that quality levels may have improved over the past four years or so (Figure 31).
- Twenty-six of the studies were controlled before/after studies, 21 non-randomised trials, 19 randomised control trials, 2 cross-sectional and 1 a study on economic costs.

![Figure 31: Quantity and quality of mental health and psychosocial support publications over time](image)

- Post-traumatic stress disorder (PTSD) was the most common outcome measured, followed by depression, non-condition specific 'general mental health' and then functioning (Figure 32). There were no studies on more severe conditions. Thirty-three studies measured more than one outcome.
- Thirty-one types of interventions were evaluated in the studies (Figure 33). The most common were psychotherapy (N=11), cognitive behavioural therapy (CBT) (N=8), psychoeducation (N=8) and mixed psychosocial (N=7). Seventeen studies included more than one main type of intervention.
4.5.2 Expert interviews

4.5.2.1 Intervention approaches

Scaling up: There is a need for more evidence on the effectiveness of low intensity and low cost interventions in non-specialised health care and community settings. Research on the following was suggested:

- The effectiveness and feasibility of delivering care through different cadres of health workers, including with intermediate training (e.g. BSc level or less) and community health workers. This should include potential risks and trade-offs.

- Evidence on how services can be most effectively integrated through existing health services/systems, particularly at the primary health care level.

- Effectiveness of different training methods, particularly how much supervision is needed to achieve effective task shifting.
- Effectiveness and feasibility of interventions for groups, in addition to individuals.
- Effectiveness and feasibility of e-mental health interventions.
- Effectiveness and feasibility of interventions addressing issues underlying multiple disorders, rather than specialist interventions on a single disorder (e.g. PTSD). Such an approach could be maximised by applying components from different treatments methods to address co-morbidity (i.e. component- or module-based therapy, see below).
**User and community-orientated services:** Mental health users, family members and communities can be involved more in preventive and treatment interventions. Research on the effectiveness of the following interventions was suggested:

- Evidence for interventions aimed at strengthening participation of affected communities in humanitarian settings, a key principle in current guidelines.
- Where appropriate, using parents and natural support systems (rather than external counsellors), including parent management training.
- Strengthening social support and coping mechanisms at family and community levels.
- School-based interventions for improving pupil mental health outcomes, including looking at the the burden on teachers (if teachers are involved).

**Interventions with other sectors:** There is a need for more evidence on how mental health and psychosocial support interventions can be better integrated with other sectors. Examples include evidence on the effectiveness of mental health and psychosocial support interventions with the following sectors:

- Research on preventive interventions that address major determinants of mental health in humanitarian settings, including interventions targeting ongoing violence (particularly against women), poverty, and social exclusion.
- The education sector (e.g. school-based interventions to improve pupil mental health outcomes).
- The nutrition sector (e.g. mental health interventions with mothers to also improve maternal and infant nutritional outcomes).
- Protection and welfare (e.g. to prevent punitive parental violence against children to improve child mental health and behaviour outcomes; e.g. to improve parental mental health to reduce parental violence against children; e.g. improve mental health outcomes among survivors of sexual violence).
- Communicable disease (e.g. how improved mental health (e.g. reducing harmful alcohol use) may reduce risky behaviour and communicable disease transmission).

### 4.5.2.2 Types of intervention to be researched

The following two complementary approaches were highlighted.

- **Psychosocial interventions:** The lack of evidence on the effectiveness of psychosocial (preventive) interventions in particular was frequently reported (although the additional complexities of evaluating such interventions were recognised). Cited examples include stronger evidence needed on psychological interventions such as psychological first aid, generic counselling, psycho-education, social interventions such as addressing violence and social exclusion, and childhood interventions.

- **Modular transdiagnostic approaches for psychological interventions:** For people with mental disorders, it was suggested that rather than providing a single treatment for a specific disorder (e.g. those with a more proven evidence base such as CBT and IPT), it could be beneficial to apply simplified individual modules from within these different treatments in order to simultaneously respond to a range of symptoms and disorders (rather than just a single disorder). Evidence would therefore be required on the effectiveness of this modular approach.

### 4.5.2.3 Mental health and psychosocial support outcomes to be researched

- **Multiple outcomes:** It was widely recognised that evidence on the effectiveness of interventions treating a range of different outcomes (e.g. PTSD, depression, anxiety or alcohol disorder) was required given the variety of disorders commonly observed with crisis-affected populations, the high levels of co-morbidity, and the greater cost-effectiveness of treating multiple disorders.

- **Severe disorders:** There remains a clear need to strengthen the evidence-base of common mental disorders, but in addition there is a need for a much stronger evidence-base on treating severe mental disorders (e.g. psychosis,
schizophrenia, severe depression) given their increased burden and that they commonly take up the majority of clinic load (albeit context specific). It was noted that while the efficacy of some interventions for severe disorders is well proven from more stable settings (e.g. use of specific drugs), the broader effectiveness of such interventions in emergency settings has not been proven. In addition, the use of supplementary psychosocial interventions for severe disorders has not been adequately tested or proven (e.g. the use of anti-stigma campaigns in communities, community-based rehabilitation and inclusion approaches).

- **Functioning**: The need for more measurement of functioning as outcome for mental health interventions was frequently noted. The additional need to ensure functioning measures were culturally appropriate was also raised.

- **Substance misuse**: The need for further research on interventions addressing harmful alcohol use and drug taking was frequently raised, including brief interventions.

- **Determinants of mental health**: Given that humanitarian settings are often chronic, it is key that interventions also address the ongoing determinants of mental health (e.g. violence against women and children, socio-economic adversity, social exclusion). These interventions are popular in practice, but have not been rigorously evaluated.

4.5.2.4 Study designs to be used

- **Randomised control trials (RCTs)**: Despite the obvious challenges of conducting RCTs in humanitarian settings, the need for RCT was widely recognised, but also that RCTs (and other study designs such as quasi-experimental designs with comparison groups) should collect data over a much longer period than has previously been the case in order to be able to track longer-term intervention effects (where ethically appropriate).

- **Mixed-methods studies**: The need for combined quantitative and qualitative studies was commonly reported. For example, to better understand local explanations for mental health disorders and causes, issues of access, the cultural acceptability and appropriateness of interventions and their implementation, and study measures.

- **Greater use of routine data**: Great analysis and publication of high quality routine facility-based data on mental disorder outcomes over time, including the use of clinical audit data and also case-study approaches to observe treatment effects and review service delivery models. This includes using mental health in routine surveillance systems as soon as possible in humanitarian crises.

- **Feasibility studies**: The need for greater evidence on feasibility of interventions was frequently raised, particularly in comparing different interventions (e.g. by being linked to an RCT) and in scaling-up interventions and for task-shifting interventions. Aspects of feasibility should include economic (see below), social and cultural (e.g. how acceptable), political, technical and operational.

- **Economic studies**: There was a widely expressed need for more studies on economic aspects of interventions, in particular for cost-effectiveness analysis to be included in intervention studies. Other research related to the need to understand the overall economic costs and benefits in interventions involving scaling-up services through the health system. Gaining a better understanding of the economic costs of poor mental health (and subsequent potential gains through improved mental health) was also highlighted.

4.5.2.5 Particular study populations of interest

- **Children and adolescents**: The need for evidence on interventions for child mental health, behavioural problems and development was raised, including the use of brief family interventions, peer education, and appropriate community mechanism and resources.

- **Older populations**: Particular evidence on interventions addressing dementia and old age problems.

- **Survivors of sexual and other forms of gender-based violence**: For example, evidence on the effectiveness of mental health interventions for survivors of sexual and gender-based violence (e.g. intimate partner violence); evidence on interventions to reduce anger and violence among men.
4.5.2.6 Key ethical issues:
- **Adverse effects:** More evidence is required on the adverse effects of mental health interventions. For example, culturally insensitive interventions; lack of sustainability; poor or (unintentionally) abusive practice due to limited training, capacity, monitoring and supervision.
- **Independent RCTs:** There is a need for more independently led trials, rather than being led by proponents of the particular mental health intervention being trialed.
- **Quality:** There is a need to improve the quality of research in order to ensure its appropriateness, and the accuracy, validity and reliability of results of the interventions.

4.5.3 Recommendations for future research
- Evidence is required on effectiveness and feasibility of scaling-up low intensity and low cost psychological interventions.
- Substantially more evidence is required on the effectiveness of psychosocial interventions.
- Evidence on the effectiveness of group-based interventions as well as interventions for individuals.
- Effectiveness of interventions using parents, peers, natural support systems, and schools.
- Evidence on the use of inter-sectoral approaches (e.g. nutrition, protection, education).
- Evidence on using a modular transdiagnostic approach to treating mental disorders, including multiple disorders.
- Evidence on the effectiveness and feasibility of e-mental health interventions.
- Evidence on the effectiveness and feasibility of training interventions.
- The effectiveness of interventions that address common issues underlying multiple disorders.
- Effectiveness of different training methods.
- Evidence on the effectiveness of treating common mental disorders but also severe mental disorders, drug and harmful alcohol use, and having a focus on functioning as a key outcome.
- Evidence from RCTs and quasi experimental studies is required. However, use of other study designs is of value, including the use routine clinical outcome data. More evidence using mixed methods is required to improve acceptability and appropriateness of interventions and associated research.
- Substantially more evidence is required on the feasibility of rolling out interventions into practice settings, particularly economic feasibility and cost-effectiveness of interventions.
- Evidence is particularly required for interventions that focus on the needs of children, adolescents, older populations and survivors of sexual and other forms of gender-based violence.
- Greater evidence on potentially harmful effects of mental health interventions is required.
- The quality of research needs to improve in order to ensure valid and reliable results.

**References (A and B categories): Mental health and psychosocial support**


4.6 Non-communicable disease
4.6.1 Systematic review

- The search strategy captured a total of 5552 papers. The vast majority (5526) either did not discuss humanitarian crises or did not consider the impact of an intervention. Twenty-six papers met the inclusion criteria.
- The majority of papers (16/26, 62%) included a test of significance for NCD outcomes (category A). 4/26 (15%) papers examined NCD outcomes without a test of significance (category B). 6/26 (23%) papers were of category C.
- The remainder of the analysis below is restricted to the 20 papers that evaluated NCD health outcomes (i.e. categories A and B).
- Most papers (13/20, 65%) were of medium quality, as assessed against the adapted STROBE criteria. 4/20 (20%) papers were considered to be high quality and 3/20 (15%) were low quality (Figure 34).
- There has been increasing interest in public health interventions for NCDs in humanitarian crises over the past two decades, with 16/20 (80%) papers published since 2000 (Figure 34).
- The quality of evidence has improved over time also. 3/4 high quality studies have been published since 2010 (Figure 34).

Cross-sectional studies were the most common design used, (11/20, 55%). There were five cohort studies, two case-control studies, one non-randomised trial and one controlled before and after study. Most studies therefore assessed a single point in time rather than following up the effectiveness of an intervention over a period of time.

The acute crisis was the most common stage of crisis under analysis (9/20, 45%), followed by stabilised stage (6/20, 30%) and early recovery (5/20, 25%) (Figure 35). Preparedness was not considered in any of the papers reviewed.

All 21 studies were conducted in the Middle East. 8/20 (40%) studies focussed on the earthquake in Turkey, and 5/20 (25%) studies were on the earthquake in Iran. The remaining studies (7/20, 35%) were in armed conflict settings: two in Israel, two in Jordan, one in Afghanistan, one in Kuwait and one in Jordan, Syrian Arab Republic, Lebanon, Gaza Strip and the West Bank, collectively. See Figure 36 and Figure 37.
It was common for studies to focus on regions that encompassed both urban and rural settings (10/20, 50%). 9/20 (45%) papers focused on urban settings and 1/20 (5%) paper focussed on a rural environment. Camp settings were not considered by any of the studies.

The most common NCD examined was renal failure (13/20, 65%); 12 of these 13 studies were set in the aftermath of an earthquake. The only other paper that examined a natural disaster was on diabetes. The seven studies in conflict settings covered a greater range of NCDs: asthma, diabetes, diabetes and CVD, hypertension, MS, renal failure and thalassaemia. See Figure 38.

The most common intervention considered was renal replacement therapy (RRT), (7/20, 35%) as a reflection of renal failure being the most common NCD. 4/20 (20%) studies examined diagnostic tools or protocols, and 3/20 (15%) were about NCD clinics. Other interventions were operations (2), anxiety relief (2), fluid therapy (1), and antibiotics, transfusions and ventilation (1). See Figure 39.
4.6.2 Expert interviews

Key findings from the expert interviews were as follows:

- There was some consensus that NCDs in humanitarian crises were not generally seen as a priority for intervention, nor for research. It was therefore felt that one of the priorities for NCDs was to make their case as an important public health issue during humanitarian crises.

- Another priority evidence gap that emerged was around protocols, guidelines and frameworks for NCDs that could be translated to different crisis scenarios. One specific gap cited was in the inclusion of NCDs in the basic package of health care for humanitarian crises.

- There was a sense that knowledge already exists around what interventions are effective for NCDs but that there was a gap in knowledge around implementation. One expert thought that improvements had been made in effective delivery mechanisms, citing the case of Haiti. However, this review did not uncover any studies from Haiti.

- Acute conditions, such as kidney injury or complications of NCDs were seen to take precedence. NCDs, in particular hypertension and diabetes, are increasing problems pre-crisis and it was thought that evidence should expand to cover these more diverse health needs.

- Data collection was seen as a barrier to developing evidence in crisis settings. Assessments of health needs were reliant on verbal accounts of current needs. Conflict zones bore additional problems since it was difficult to continue data collection while working in dangerous condition, which called the accuracy of data into question. Also, information on resource and infrastructure are often classified in these settings.

- Ethical approval was cited as a common obstacle to research in crisis settings.

- Experts proposed that a pre-conflict understanding of NCD needs would assist the understanding of the interventions needed in an emergency. Before and after study designs were recommended, in particular to understand how best to ensure continuity of care and reduction of complications.

- There was considered to be a lack of follow up of NCD intervention, particularly for renal replacement therapy. Longitudinal study designs were recommended.
There was felt to be a lack of consideration of older people during crises, who are disproportionately affected by NCDs. Age stratification of these older age groups was therefore recommended.

It was also suggested that research should be conducted in collaboration between conflict and health teams to improve the quality of information generated by each.

It was highlighted by several experts that essential drugs for NCDs were not included in emergency kits, which was seen as an oversight.

Suggestions for the development of guidelines and standards centred on sharing learning from other topic areas. It was considered that a lot of research had been done on retaining access to HIV medication, which would be equally applicable to NCDs. Studies examining the role of nutrition in childhood could provide understanding around the impact of a crisis on the subsequent development of NCDs. Another suggestion was to research camp or slum areas, which could provide indicators of effective interventions in more acute crises.

### 4.6.3 Recommendations for future research

**Indicators, standards, and guidelines**

- The key priority for NCD research is in the development and testing of standards and guidelines for the delivery of NCD care in crisis settings.
- The evidence base would benefit from an understanding of how current practice (including in camps) vary from new recommended standards and guidelines, in order to develop recommendations for implementation.

**Study design**

- Attention should be paid to producing higher quality evidence. The evidence base would benefit from: before and after, or longitudinal study designs; with careful consideration of feasibility and cost, bearing in mind the movement of affected population.
- There is a need for sex and age disaggregated data of the pre-crisis situation.

**Delivery of health interventions**

- Improvements to the effectiveness of delivery of NCD interventions during crises could be achieved by working with specialists in other health areas. For example, addressing nutritional standards, particularly in camp situations where support is likely to be longer term, would play an important role in the prevention of NCDs.
- Of high priority is identification and inclusion of essential drugs for NCDs into emergency kits and the subsequent evaluation of the basic package of care for humanitarian crises.

**Context**

- There is a lack of evidence beyond the Middle East region, despite a high prevalence of NCDs in Asia and increasing prevalence in other regions.

### References (A and B categories): Non-communicable diseases (NCDs)


4.7 Injury and physical rehabilitation

4.7.1 Systematic review

- The combined search strategies captured a large number of peer-reviewed articles broadly related to injury and rehabilitation (n=4798). Following full review, a combined total of 117 articles met the inclusion criteria, and were related to injury and rehabilitation-related public health interventions in humanitarian crises.

- A small number of papers (n=24) evaluated health outcomes and quoted some form of significance test (category A). A further 42 articles described outputs in the form of surgical, medical, and rehabilitative interventions, but did not discuss associated health outcomes (category C). The remaining 52 articles discussed health outcomes, but did not draw statistical associations between the intervention and outcomes (category B).

- Each paper was quality-assessed using the adapted STROBE criteria for observational studies. Only 3% (n=2) papers were of high quality. No papers met the full STROBE criteria as sample size calculations were absent.

- Both quantity and quality of papers increased over the last 23 years. 61% (n=46) of the papers in this study were published between 2000 and 2013. 81% (n=21) of the higher quality studies were published between 2000 and 2013 (Figure 40).

- The majority of studies were cross-sectional in design (n=47; 67%), followed by cohort studies (n=21; 28%). A single economic study investigated the cost-effectiveness of short-term orthopaedic missions in relief and elective contexts. A single case-control trial investigated the rehabilitation outcome of patients with war-related amputations. Six studies were non-random trials.

- The majority of studies were based on injuries seen in Asia (n=45; 59%). Sixteen of the Asian studies (36%) were specifically related to the 2008 Wenchuan Earthquake, Central China. The second most studied continent was Europe, with 20 studies (26%). All of these studies related to conflict in the Former Yugoslavia in the 1990s. See Figure 41.
63% (n=48) of the studies were conducted in conflict settings, or with patients who had suffered conflict-related injuries.

The majority of papers reviewed or collected data from the acute phase of a crisis (n=65; 86%). A small number of papers looked at health outcomes in the early recovery and stabilisation phases (n=5 and n=6 respectively). No papers were identified that examined the relationship between preparedness and health outcomes (See Figure 42).

97% of the papers described interventions for the general population (n=74).

The majority of the papers (54) were set in a mixed urban-rural environment, while only one paper examined injury and rehabilitation in a refugee camp setting. Fourteen studies took place both in rural and urban areas. Seven papers focused on urban areas and one in refugee camps.

The majority of the papers examined a range of physical injuries (n=20; 26%). Limb injuries were the subject of 16 papers (21%), most of which examined the repair of fractures (Figure 43).
Thirty of the studies described a range of surgical interventions (39%). Eight papers looked at surgical external and internal fixation techniques in particular (11%). This type of operation was the focal point of published research more frequently than any other complex surgical technique. A further five papers looked at health outcomes following limb amputation specifically (7%), while seven papers evaluated different forms of rehabilitation (9%) (Figure 44).
4.7.2 Evidence gaps

- Evidence for rehabilitation-related interventions is particularly limited and currently there are no major research initiatives in this field.
- Research related to injury and rehabilitation is limited among operational NGOs and is rarely integrated into programmes.
- Patients suffering from physical injury, and requiring rehabilitation, need continued care and follow up; in this sense management is comparable to that of non-communicable diseases. As such, it is crucial that local service providers are able to maintain the services delivered during the emergency phase. This has been challenging in a number of different contexts.
- Experience of armed conflict – specifically civil war – in middle-income countries forced practitioners to adapt their standards and model for interventions: the technologies used were upgraded, competency within the local health system was better harnessed, and it was possible to import materials.
- Many of the studies were conducted by surgeons, and are based on their experiences during crises.
- Research related to injury and rehabilitation focused on the clinical and technical aspects of an intervention, as practitioners wanted to test different protocols and technologies.
- The progress made with new technologies means that research can now focus on under-researched aspects of crisis interventions, such as service delivery and health systems. Several guidelines are available on surgery and orthopaedics. At the individual level, professionals know what services they have to deliver. The challenge remains with whom to work, how to integrate rehabilitation into the general health system, and how to integrate local services when establishing an acute intervention.
- Research also focused on demonstrating that people with disabilities should not be excluded from mainstream services offered by humanitarian organisations. Physical and communication obstacles experienced by people with disabilities during the acute emergency phase create a barrier to access to services. However, the complexity of this situation has not been fully explored.
- The aftermath of the 2010 Haitian earthquake required extensive surgical and rehabilitative interventions. The scale of the intervention and the difficulties met by operational actors generated new questions related to the capacity of humanitarian organisations to intervene in such contexts.
4.7.3 Recommendations for future research

**Study design**

- More evidence is needed related to the effectiveness and cost-effectiveness of rehabilitative interventions. More before and after studies are needed to assess the impact of interventions.
- There is a need for more high quality, methodologically robust, evidence and studies that assess long-term health outcomes. While there is a reasonable quantity of evidence related to injury, much of this evidence is low quality, cross-sectional in nature, and conducted by clinical practitioners.
- Follow-up studies would enable better assessment of long-term health outcomes, functionality, and quality of life (e.g., Standardised assessment forms for physical function as well as environmental factors in disaster victims to enable comparative research). In particular, there is a lack of high-quality evidence related to the effect of rehabilitative interventions on physical disabilities.
- More research is needed to better understand the mechanisms that enable a continuum of care as programmes transition from the acute to the longer term, development phase.

**Indicators, standards, and guidelines**

- Research is needed to develop appropriate quality standards and measurements of service performance.

**Context**

- More research should be conducted during crises in Africa and the Americas in order to develop and evidence base for context-specific interventions.
- More evidence must be collected following natural disasters, as illustrated by the response to the 2010 Haitian Earthquake.
- More evidence must be collected related to physical rehabilitation in refugee camp contexts.
- More studies are needed that evaluate interventions in the preparedness phase, and the subsequent impact they have on health outcomes.

**Delivery of health interventions**

- More research is needed on how to integrate rehabilitation into the general health system, and how to integrate local services in the delivery of humanitarian health interventions.
- More research is needed to understand the complexity of mainstreaming disability into humanitarian health interventions.

**References (A and B categories): Injury and physical rehabilitation**


256. Amirjamshidi, A., K. Abbassioun, and H. Rahmat, Minimal debridement or simple wound closure as the only surgical treatment in war victims with low-velocity penetrating head injuries. Indications and management protocol based upon more than 8 years follow-up of 99 cases from Iran-Iraq conflict. Surgical Neurology, 2003. 60(2): p. 105-10; discussion 110-1.


4.8 Health service delivery
4.8.1 Systematic review

- The search strategy was designed to be sensitive, and as a result captured 28,199 papers. An initial filter, removing papers that did not discuss humanitarian crises, health service delivery or lower and middle income countries reduced this number to 2,534 papers. The second and final filter only included studies that discussed the acute stage of crises, the effectiveness of health service delivery and put a quantifiable figure on the effectiveness of health services. Thirty-two papers met these inclusion criteria.

- A number of websites were reviewed for grey literature but no papers met the inclusion criteria.

- The majority of papers (28/32, 87.5%) considered only outputs of health service delivery, such as the number of patient consultations performed. These papers were considered to be category C and since they did not evaluate health outcomes they were not further assessed for quality. The four papers from category B (which considered health outcomes but did not assess their statistical significance) assessed quality using the adapted STROBE quality criteria and all four papers were assessed as being low quality. See for the trends of papers over time.

- There appears to be an increasing interest in evaluating the effectiveness of health service delivery in humanitarian crises. 69% (22/32) of papers have been published since 2000, including 3 of the 4 category B papers (Figure 45).

![Figure 45: Quantity and quality of health service delivery studies over time](image)

- All 32 papers were of cross sectional study design. The studies assessed a single point in time rather than following up the effectiveness of health services over a period of time, which constitutes a lower quality study design for the evaluation of effectiveness.

- 38% (12/32) of studies were conducted by multiple agencies. The most common type of research agency was academic institutions (21/32, 66%). 50% (16/32) of studies were conducted by medical facilities, 13% (4/32) were by NGOs, 9% (3/32) by the army or navy and 9% (3/32) by government agencies.

- It was not possible to identify which agency had funded the research in any of the papers reviewed.
Research was conducted in a range of global locations (Figure 46). The most common region for study was the Middle East (11/32, 34%), followed by Asia (8/32, 25%), Eastern Europe (5/32, 16%), the Caribbean (3/32, 9%), Africa (2/32, 6%) and South America (1/32, 3%). One paper (3%) considered multiple countries and one paper (3%) did not detail the countries under analysis.

All of the studies conducted in Eastern Europe and Africa considered armed conflict. Studies conducted in the Middle East considered equally natural disasters (5/11) and armed conflict (6/11). Studies in Asia were predominantly about natural disasters (7/8), and all studies in South America, across multiple countries and where the country was unknown, considered natural disasters.

Papers were split as to the type of humanitarian crisis researched: 56% (18/32) were of natural disasters and 44% (14/32) of armed conflict (Figure 47).

The papers reviewed spanned a range of health settings. 25% (8/32) of papers evaluated an urban location, 28% (9/32) evaluated a rural setting, 34% (11/32) spanned both urban and rural locations, 9% (3/32) evaluated a camp setting, and one paper (3%) compared a rural location and a camp setting.

The majority of studies (72%, 23/32) evaluated the acute crisis, and a further 2 papers (6%) considered both the acute stage and early recovery (Figure 48).

Papers were split between discussing health services that met all health needs (14/32, 44%) and services that focused specifically on casualty management (14/32). Four papers (13%) tackled more specific health needs: orthopaedic casualties and infection, paediatric services, surgery, and HIV, tuberculosis and family planning.
The majority of papers (17/32, 53%) focused on secondary care services. Papers also focused on primary care (6/32, 19%) or looked at the interconnection between primary and secondary care (5/32, 16%), and possibly also tertiary care (1/32, 3%). Smaller numbers of papers discussed ambulatory (2/32, 6%) and self care (1/32, 3%). See Figure 49.
Most papers (18/32, 56%) evaluated the effectiveness of health service delivery in terms of numbers of patients seen or procedures performed (Figure 50). A number of other health outcomes were also evaluated, albeit by smaller numbers of papers: mortality (4/32, 13%), outputs of a procedure, such as patient transfer or discharge (3/32, 9%), equity (2/32, 6%), patient satisfaction (2/32, 6%), quality (1/32, 3%), security (1/32, 3%) and the appropriateness of an assessment for locating field hospitals (1/32, 3%).

Statistical analysis of the effectiveness of health service delivery was fairly crude. Twenty-five papers (78%) presented numbers and/or percentages as measures of health outcomes, four papers (13%) measured mean scores, two papers (6%) measured rates and one (3%) calculated the difference between means.

Nine papers (28%) examined how existing health services within a country managed the crisis. Of these papers, six focused on rescue and casualty management and three discussed the impact on general health services. Twenty-two papers (69%) examined the implementation of temporary health services to help manage the crisis. Of these, 12 papers discussed field hospitals, seven discussed war hospitals and three examined health services in relief camps. One paper (3%) compared existing health services across a rural district and temporary health services in a camp (Figure 51).

Seventeen papers (53%) included discussion of the impact of external factors on health service delivery – these factors were discussed, not evaluated. Common factors touched on included facilitation by the Ministry of Health, financial assistance and the availability, or lack of, local health personnel.

None of the papers included discussion of the impact that health service delivery had on any external factors.

Eight (25%) papers referenced the use of guidelines within health services. No two papers referenced the same guidelines, however. The guidelines referred to were: WHO/PAHO essential requirements; the RAND/UCLA appropriateness method for determining field hospital setting in an earthquake; NATO guidelines for mass casualties; and Zung’s Self-Rating Depression Scale; as well as locally produced guidelines for patient transfer, performance appraisal and war surgery.
4.8.2 Expert interviews

Methodologies and quality of evidence:

- Health service delivery is a cross-cutting issue common to every health topic. Most research gaps in public health in humanitarian crises concern the mode of delivery of health interventions. However, the number of studies in this field remains very limited.
- There has been increasing interest in research on health service delivery in humanitarian crises during the last decade. However, the quality of many studies is questionable. There is a pressing need for introducing innovative and robust methods to study health service delivery in humanitarian crises.
- There needs to be better use of mathematical models in assessing the (cost) effectiveness of different models of delivery.

Model of delivery and integration of interventions into local health services:

- Humanitarian interventions are often in parallel to the local health services which have usually been weakened by the crisis. Many respondents mentioned the necessity of collaborating with local health services to ensure the continuity of care after the end of the humanitarian crisis. There is, however, little evidence on the most effective way of integrating humanitarian interventions into the local health services. There are additional research questions related to: which interventions should be integrated? Which one should be vertically delivered?
- The objective of universal coverage during humanitarian crises is often accompanied with free healthcare but may create unexpected effects (positive and negative) on local health services and has issues for sustainability and equity of services. These aspects have nevertheless not been explored sufficiently by researchers.
- The importance of measuring the effectiveness of different models of delivery was highlighted. Comparisons should be made between facility-based and community-based interventions as well as the delivery of comprehensive packages of interventions compared with single interventions. This field of investigation is broad as every health topic may have different models of delivery.
- Packages of care are commonly promoted but need more research evidence-base for the content of packages, costs of the package, and health benefits of packages. There is also a lack of evidence on the minimum package that could be implemented in very acute settings and what the tradeoffs may be.

Continuity of care:

- The issue of integration is also related to the continuity of care which is a necessity in a context where chronic diseases and NCDs are increasingly important. Studies should focus on examining health facility capacities to deliver and financially sustain quality services after the departure of humanitarian actors.
- There is a need for much more evidence on how to develop longer-term strategies for delivering health care (including for the health system more broadly) to move beyond the short-term approaches common to humanitarian settings.
4.8.3 Recommendations for future research

- There is a strong need to improve the quantity and quality of the evidence base on health service interventions. Existing studies predominantly measure outputs of services, rather than health outcomes, and are exclusively of cross-sectional study design.
- More research is required on different service delivery models of health care.
- More research is required on the content, delivery and health outcomes of different service delivery packages of care.
- There was a bias in the evidence base towards the impact of temporary health services and issues of continuity and sustainability of care need to be researched. Longitudinal study designs are needed to help capture this information.
- There was a lack of consensus over the guidelines to be used, or even evaluated, for health service delivery. Further studies looking specifically at this issue would enable practical suggestions for service delivery in crisis situations.

References: Health services delivery


4.9 Health systems

4.9.1 Systematic review

- The systematic review on health systems included both quantitative and qualitative studies given the particularly multifaceted nature of health systems. The search strategy yielded 16,997 papers, but only 56 papers met the inclusion criteria.

- The number of papers has been increasing with time (Figure 52), with a significant increase in papers published from 2010 onwards. It has some predictable surges following major humanitarian crises, such as the Tsunami. Interestingly only one paper was identified as looking at the health system context of natural disasters prior to 2004, with most papers focusing on conflicts from 1987 to 2003.

- The majority (36/56) of the papers focused on a context of conflict, 18 focused on a natural disaster and one on a political crisis. Of the papers on a natural disaster, 13 focused on earthquakes, five on the tsunami, three on floods and one on a cyclone (with some papers focusing on more than one crisis).

- The research was spread across four continents, with papers focussing on humanitarian crises in Asia (24 papers), Africa (19 papers), Europe (13 papers) and South America (8 papers). The crisis with most papers was the conflict in Kosovo (5 papers), followed by earthquakes and floods in Pakistan (4 papers) and conflict and tsunami in Indonesia.

- Two of the papers were graded as a high quality of evidence. Two papers were graded as a medium quality of evidence. Forty-four of the papers were assessed as low quality. Eight of the papers could not be assessed as the full paper could not be obtained.

![Figure 52: Quantity of health systems studies over time, by crisis type](image)

![Figure 53: Health systems studies by target group](image)
The majority (48/56) of the papers focused on the general population, three papers focused on refugee populations, one on Internally Displaced People (IDP) populations, two on health workers and two on a mixed population (Figure 53).

Most of the papers (37/56) were case studies from humanitarian crises. Other papers included 14 descriptive papers, 2 literature reviews, and 1 epidemiological community-based study.

**Health system building blocks:**

- The studies on different health system building blocks are shown in Figure 54.
- Eight papers had a focus on policy areas of leadership and governance, of which five looked at opportunities for policy and four on impact of the crisis (one looking at both areas).
- There were five papers with a focus on coordination, with coordination mentioned in 11 other papers.
- There were seven papers identified with a focus on health workforce and ten papers which mentioned health workforce. Five papers looked at the impact of crises on human resources and four papers looked at crises as opportunities for building back better.
- A single paper with a focus on health financing, and 10 others mentioned health financing.
- Only one paper was identified with a focus on medicines, which looked at essential medicines management following the earthquake in Pakistan. Three of the other papers had a mention of medicines.
- Eight papers had a focus on the use of Health Information Systems in response to humanitarian crises papers. Three other papers had a mention of Health Information Systems. Most of the papers specifically looked at disease surveillance systems.

![Figure 54: Studies by health system building block](image)

**4.9.2 Expert interviews**

**4.9.2.1 Methodologies and quality of evidence:**

- There has been increasing interest in health systems research in humanitarian crises. There are nevertheless many questions about how to conduct health research in insecure and unpredictable settings. As a result, the quality of studies is questionable and has often been rated as low. There is a pressing need for introducing innovative and robust methods to study health systems in humanitarian crises.
- One constraint identified by the key informants is the lack of reliable health information system in most developing countries before the crisis starts. Researchers have to conduct research where baseline data is often inconsistent or missing.
4.9.2.2 Delivery and integration of interventions into local health systems:

- Humanitarian interventions often intervene in parallel to the local health systems, which has been most of the time weakened by the crisis. Many respondents mentioned the necessity of collaborating with local health services to ensure the continuity of care after the end of the humanitarian crisis. There is however little evidence on the most effective way of integrating humanitarian interventions into the local health system. There are additional research questions related to: which interventions should be integrated? Which one should be vertically delivered?

- The objective of universal coverage during humanitarian crises and often accompanied with free healthcare may create unexpected effects on local health services. These aspects have nevertheless not been explored by researchers.

- A third aspect highlighted by respondents is the importance of measuring the effectiveness of different models of delivery. Comparisons should be made between facility-based and community-based interventions as well as the delivery of comprehensive packages of interventions compared with single interventions. This field of investigation is broad as every health topic may have different models of delivery.

4.9.2.3 Continuity of care:

- The issue of integration is also related to the continuity of care, which, as many key informants explained, is a necessity in a context where chronic diseases and non communicable diseases (NCDs) are increasingly important. Studies should focus on the assessment of health systems capacities to deliver quality services after the departure of humanitarian actors.

4.9.2.4 The resilience of health systems:

- Research is needed to measure and predict the capacity of health systems to adapt to humanitarian crises. This notion of resilience is related to measurement but preparedness to crises. There is limited evidence on the impact of preparedness activities on the capacity of health systems to absorb or adjust to crises.

4.9.3 Recommendations for future research

- Whilst understanding the considerable challenges that exist when carrying out research in this area, there is a need for more high quality evidence with regards health systems context of humanitarian crises.

Health system strengthening

- There is a need for much more research into some of the specific areas of the health system, particularly influence of health financing and access to essential medicines in a humanitarian crisis.

Resilience

- Evidence on the resilience of health systems to absorb crises and on their capacities to continue the delivery of services (e.g. non communicable diseases) after the departure of humanitarian actors.

- There are a number of papers that focus on conflict, but the evidence is weaker for natural disasters. These include the impact of natural disasters on the health system and opportunities arising from natural disasters for areas of the health system.

- There is a need for further research to measure the impact crises can have on local health systems.
Integration of services

- Evidence on the effectiveness of different models of delivering health interventions during humanitarian crises: vertical versus integrated humanitarian interventions, facility-based versus community-based interventions, comprehensive package vs. single interventions.

Preparedness of crises

- There is a clear need for a strong evidence base on the impact of preparedness and whether stronger and better prepared health systems have improved health outcomes following a humanitarian crisis.

References: Health systems


409. Thieren, M., Special issue: Health information systems; Gauging a response to humanitarian emergencies; Good data is vital for poverty reduction. (Special issue: Health information systems; Gauging a response to humanitarian emergencies; Good data is vital for poverty reduction.). Bulletin of the World Health Organization, 2005. 83(8): p. 561-640.


5. Results for contextual factors

5.1 Access to healthcare

5.1.1 Systematic review

- The search strategy on this contextual factor captured a large number of related peer-reviewed articles (2224), the vast majority of which (2160) either did not discuss humanitarian crises or did not consider the impact of access to healthcare on a public health intervention during crisis.

- There is only a modest body of available evidence assessing the impact of access to healthcare on the effectiveness of health interventions during humanitarian crises (64 papers).

- There is increasing interest in the characterisation of the impact of access on healthcare interventions during humanitarian crises, with 58/64 (91%) of all studies conducted since 1980 being published in the last decade.

- The majority of available evidence is of low to moderate quality: 18/64 (28%) of papers were from category C evidence, 27/64 (42%) were from category B, and 19/64 (30%) were from category A.

- All studies were observational. 32/64 (50%) of studies were descriptive in design and of these 14/32 (44%) were comparative: half the comparative studies (7/14) compared changes during the period of a humanitarian crisis, the other half (7/14) compared changes before and after a crisis struck. 31/64 (48%) employed a cross sectional design and one paper (2%) was a retrospective cohort study.

- Of the location-identified research on health access during humanitarian crises, the country most commonly studied was Afghanistan (10/64, 16%), followed by Pakistan (8/64, 13%), Sri-Lanka (5/64, 8%), then Burma (4/64, 6%). As a region, Africa followed Asia in being the most intensely studied, with 13/64 (20%) articles focusing on countries here including DRC (2), Côte d'Ivoire (2), Sudan (2), Botswana (1), Guinea-Bissau (1), Kenya (1), Nigeria (1), Sierra Leone (1) and Somalia (1). Indeed, these countries represent some of the most violent environments to live in during their respective times of conflict and would be expected to have been associated with reduced access to healthcare for their populations. Other countries studied included China (3), Colombia (3), Haiti (3), Indonesia (2), Jordan (2), Nepal (2), Nicaragua (1), Peru (1) and Syria (1). 5/64 (8%) papers studies multiple countries.

- Evidence for the different types of humanitarian crises focused heavily on armed conflict - 53/64 (83%) considered these; 11/64 (17%) considered natural disaster, in particular earthquakes (8) and tsunamis (2).

- Most papers (39/64, 61%) focused on the general population, 15/64 (23%) considered IDPs, and one paper compared the general population with IDPs. 9/64 (14%) papers considered refugee populations.

- Most papers (41/64, 64%) considered both urban and rural settings, 14/64 (22%) considered only the rural setting, and 9/64 (14%) considered only the urban environment.

- Evidence for access to healthcare during humanitarian crises focused principally on the access of end-users (56/64, 88%). Of these papers, 25/64 (39%) considered all aspects of access of end-users, 16/64 (25%) considered only their physical access, 4/64 (6%) only economic access, two papers focused on the issue of non-discrimination in healthcare access; and one on informational access. Only 3/64 (5%) articles considered primarily the access of health workers to provide healthcare to end-users. Of these, two papers considered their economic access in terms of feasibility of their planned public health interventions; one paper considered their physical access. Finally, 5/64 (8%) papers considered access issues of both end-user and health workers together.
Regarding the types of public health interventions, 36/64, (56%) articles studied access to existing medical services. 18/64 (28%) articles considered access to international medical assistance or existing services supplemented by international intervention. The remaining articles (10/64, 16%) considered a combination of local governmental, non-governmental or undefined mechanism of supplementation of existing medical services.

Female reproductive, antenatal and obstetric services together formed the health topic most studied regarding access (12/64, 19%). 10/64 (16%) papers considered all health services in general, 8/64 (13%) papers considered primary care and 4/64 (6%) considered mental health services. There was also specific evidence on access to infectious disease control: 6/64 (9%) papers studied malaria, 4/64 papers (6%) TB, and two papers HIV/AIDS.

Concerning stage of crisis, 10/64 (16%) studies focused on the acute phase, 5/64 (8%) on early recovery, and the vast majority (49/64, 77%) on chronic situations.

5.1.2 Expert Interviews

Key findings from the expert interviews were as follows:

Priority gaps in the available evidence on access to healthcare which need to be filled include:

- Real-time mapping of access to healthcare of end-users.
- Optimising healthcare access in crisis areas outside government control for both end-users and healthcare workers.
- Health disparities arising from access inequities between resident and transiting populations within a crisis location.
- Role of mobile phones and other digital technologies in improving health access for end-users.
- Certain populations experiencing crisis, including adolescents; the disabled; the elderly; those with chronic disease; and prisoners or detainees.

Issues related to the type of crisis and access to healthcare:

- Gathering evidence and the study of this contextual factor is most difficult in the context of armed conflict and in situations where infrastructure has suffered severe and extensive destruction such as is typical after earthquakes.

Type of studies needed:

- Randomised and controlled trials would be an impractical, unfeasible and unethical means of seeking evidence on this contextual factor.
- The greatest source of shared knowledge likely lies within the grey literature, but the extent to which this can be used as scientific evidence is highly variable and its usefulness is seen to be dependent on the reputation of the agency producing it.
- By nature, innovations aimed at systemic transformative change need to transcend evidence-based interventions and therefore the quest for evidence must itself be carefully directed.

Use of guidelines and standards in the study or programmatic development of access to healthcare:

- The Geneva Conventions are the most widely used standards for this contextual factor.
- Other guidelines and standards which are particularly useful include: (i) government sources and statistics, (ii) International Crisis Group (ICG) reports, (iii) existing institutional guidelines, (iv) policy statements of agencies, (v) needs assessments of agencies, and (vi) informal peer advice.
- Other than the Institutional Review Board (IRB) process, there are very few standardised ethical guidelines in the field of humanitarian research and programmatic development.
There was excellent consensus on the perceived research gaps in this contextual factor among the humanitarian experts interviewed.

5.1.3 Recommendations for future research

**General**
- Given the current interest in and debate surrounding the issue of access to service provisions during crises in the humanitarian sector, more quality research needs to be done in the domain of access to healthcare during humanitarian crises.

**Evidence needed to explore the following issues:**
- Real-time mapping of access to healthcare of end-users.
- Optimising healthcare access in crisis areas outside government control for both end-users and healthcare workers.
- Health disparities arising from access inequities between resident and transiting populations within a crisis location.
- Role of mobile phones and other digital technologies in improving health access for end-users.

**Indicators, standards and guidelines**
- In order to facilitate the generation of more relevant evidence, research into the development of standardised methods or indicators to measure the different aspects of both end-user and health worker access to healthcare would be most useful.

**Context and populations**
- Current evidence on this contextual factor focuses primarily on descriptions of what types of access to healthcare is affected during crises and not the influence of access on the impact of public health interventions, which therefore needs greater research attention.
- Research is needed to measure the impact of access to healthcare on health interventions during natural disasters and in the acute phase of crises.
- Populations needing increased research include IDP and refugee populations, adolescents, the disabled, the elderly, those with chronic disease, and prisoners, or detainees.

**References: Access to health care**

418. Balthazar, B., Needs and accessibility to health services: Attitudes and perceptions of internally displaced head-of-household victims from Medellin, Colombia, 2011, ProQuest Information & Learning: US.
420. Beeche, A.A., Disparities in key health indicators between vulnerable groups living in refugee and host communities. Case study: Largo refugee camp and host community, Kenema District, Sierra Leone, 2008, ProQuest Information & Learning: US.


461. Rassekh, B.M., Utilization of health services for children after the Tsunami in Aceh, Indonesia, 2007, ProQuest Information & Learning: US.


464. Saadi, A., B. Bond, and S. Percac-Lima, Perspectives on preventive health care and barriers to breast cancer
5.2 Accountability to end-users

5.2.1 Systematic review

- The search strategy on this contextual factor captured a large number of related peer-reviewed articles (3876), the vast majority of which (3846) either did not discuss humanitarian crises or did not consider the impact of accountability to end-users on a public health intervention during crisis.
- There is little available evidence assessing the impact of accountability to end-users on the effectiveness of health interventions during humanitarian crises (30 papers).
- There is increasing interest in the characterisation of the impact of accountability to end-users on healthcare interventions during humanitarian crises, with 26/30 (87%) of all studies conducted since 1980 being published in the last decade.
- The majority of available evidence is of low to moderate quality: 12/30 (40%) of papers were from category C evidence; 7/30 (23%) were from category B; and 11/30 (37%) were from category A.
- All studies were observational. Half of the studies were descriptive in design and none of these were comparative. The other half of the studies were cross-sectional; of these, 6/15 (40%) compared changes over a period of time during a humanitarian crisis.
Of the location-identified research on accountability to end-users during humanitarian crises, the most commonly studied region was Asia (10/30, 33%) with Afghanistan and Pakistan being most studied here (three papers each), followed by Africa (6/30, 20%). A further 12/30 (40%) papers considered multiple (more than two) different countries across regions.

Evidence for the different types of humanitarian crises focused primarily on armed conflict: 13/30 (43%) considered these; 10/30 (33%) considered both armed conflict and natural disasters; and 7/30 (23%) considered only natural disasters, in particular floods (3) and tsunamis (2).

Most papers (20/30, 66%) focused on the general population, 6/30 (20%) considered IDPs only, 3/30 (10%) papers considered refugee populations only, and one paper compared IDPs and refugees.

Most papers (17/30, 57%) considered both urban and rural settings, 12/30 (40%) considered only the rural setting, and one paper considered only the urban environment.

Of all the available evidence, only 2/30 (7%) studies considered all three aspects of healthcare accountability to end-users, namely its acceptability, availability and quality. 15/30 (50%) of studies considered acceptability; of these four considered one other aspect in addition. 12/30 (40%) of articles considered quality of healthcare; of these six considered one other aspect in addition. 9/30 (30%) of studies considered availability; of these six considered one other aspect in addition.

Regarding the types of public health interventions, 21/30 (70%) articles studied accountability of international medical assistance agencies; of these, 7/30 (23%) considered how they interacted with local existing health services, and 3/30 (10%) others concerned the organisation Médecins San Frontières (MSF) specifically. 6/30 (20%) further articles considered accountability to end-users of existing health services only.

Basic, general and primary healthcare services together formed the public healthcare area most studied regarding accountability to end-users (19/30, 63%). 5/30 (17%) papers considered the health topic of communicable diseases, including TB (2 papers), malaria (1), HIV/AIDS (1), and cholera (1). 3/30 (10%) papers considered obstetric services.

Concerning stage of crisis, 4/30 (13%) studies focused on the acute phase, 4/30 (13%) on early recovery, and the vast majority (22/30, 73%) on chronic situations.

5.2.2 Expert Interviews

Key findings from the expert interviews were as follows:

Priority gaps in the available evidence on accountability to end-users which need to be filled include:

- Role and methods of informed consent of end-users in crisis settings.
- Perception of end-users regarding humanitarian healthcare delivery.
- Validation of assumptions concerning end-users.
- Nexus of human rights and humanitarian public health interventions.
- Impact of the asymmetry of power between end-users and humanitarian agencies on public health interventions.
- Quality of healthcare delivered to end-users in crisis.
- Cost-benefit analyses of interventions and humanitarian health economics.
- Role and methods of behavioural change of end-users in improving the impact of humanitarian healthcare delivery.
- Ethical guidelines for humanitarian public health policy-making.
- Certain populations experiencing crisis, including adolescents, the disabled, the elderly, those with chronic disease, and the LGBT community.
**Issues related to the type of crisis and accountability to end-users:**
- Gathering evidence and the study of this contextual factor is difficult and has been limited in all types of crises largely due to a lack of consensus on appropriate measures of accountability and optimal endpoints.

**Type of studies needed:**
- Randomised and controlled trials would be an impractical, unfeasible and unethical means of seeking evidence on this contextual factor.
- The greatest source of shared knowledge likely lies within the grey literature but the extent to which this can be used as scientific evidence is highly variable and its usefulness is seen to be dependent on the reputation of the agency producing it.
- By nature, innovations aimed at systemic transformative change need to transcend evidence-based interventions and therefore the quest for evidence must itself be carefully directed.
- The most useful contribution towards the progress of this contextual factor is likely to come from debate and consensus-building around moral, philosophical and professional considerations rather than from scientific evidence.

**Use of guidelines and standards in the study or programmatic development of accountability to end-users:**
- The Sphere Project standards are the most widely used standards for this contextual factor.
- Other guidelines and standards which are particularly useful include: (i) ALNAP guidelines, (ii) CDC guidelines, (iii) UNICEF guidelines, (iv) WHO guidelines, (v) International Crisis Group (ICG) reports, (vi) existing institutional guidelines, (vii) policy statements of agencies, and (viii) informal peer advice.
- Other than the Institutional Review Board (IRB) process, there are very few standardised ethical guidelines in the field of humanitarian research and programmatic development.

There was excellent consensus on the perceived research gaps in this contextual factor among the humanitarian experts interviewed.

### 5.2.3 Recommendations for future research

**General:**
- Accountability to end-users has become a core value in the humanitarian sector but represents an area relatively devoid of high quality evidence and needs more research.
- High quality comparative studies are needed to inform how accountability influences health interventions and outcomes, in particular comparing health interventions of varying levels of accountability, and comparing different mechanisms of healthcare accountability (e.g. international vs. purely local or domestic accountability mechanism).
- More evidence is needed on (i) the role and methods of informed consent of end-users in crisis settings, (ii) the perception of end-users regarding humanitarian healthcare delivery, (iii) the asymmetry of power between end-users and humanitarian agencies on public health interventions, (iv) the role and methods of behavioural change of end-users in improving the impact of humanitarian healthcare delivery, and (v) mechanisms and policies which safeguard or improve accountability to end-users during humanitarian crises.

**Context:**
- Current evidence on this contextual factor focuses primarily on descriptions of the different aspects of accountability to end-users in healthcare provision during crises such as availability, acceptability, quality, but does not assess the influence of accountability on public health interventions.
Indicators, standards and guidelines

In order to facilitate the generation of more relevant evidence, research into the development of standardised methods or indicators to measure the different aspects of accountability in health interventions would be most useful.

References: Accountability to end-users


5.3 Health assessment methods

5.3.1 Systematic review

- The search strategy on this contextual factor captured 663 related peer-reviewed articles, the vast majority of which (580) either did not discuss humanitarian crises or did not consider health assessment methods in such situations.
- There is a relatively modest body of available evidence considering health assessment methods during humanitarian crises (83 papers).
- There is increasing interest in the methodologies of assessment, evaluation and estimation of health and health-related factors during humanitarian crises, with 63/83 (76%) of all studies conducted since 1980 being published in the last decade.
- The majority of available evidence is of low to moderate quality: 13/83 (16%) of papers were from category C evidence, 36/83 (43%) were from category B, and 34/83 (41%) were from category A.
- All studies were observational. 16/83 (19%) of studies were descriptive in design and of these 9/16 (56%) were comparative. 67/83 (81%) employed a cross-sectional design and of these 13/67 (19%) were comparative. In the comparative studies, the points of comparison included assessment methods within different settings, different affected populations, and between different assessment methodologies themselves.
- Of the location-identified research on health assessment methods during humanitarian crises, the most commonly studied region was Asia (29/83, 35%), followed by Africa (26/83, 31%), then the Middle East (11/83, 13%). The most commonly studied countries were Afghanistan and Thailand (six papers each), followed by Iraq, Pakistan, Sudan and Uganda (five papers each). A further 8/83 (10%) papers considered multiple (more than two) different countries across regions.
- Evidence for the different types of humanitarian crises focused heavily on armed conflict: 60/83 (72%) considered these; 20/83 (24%) considered natural disasters, in particular earthquakes (8) and tsunamis (4); and 3/83 (4%) considered both types of crises.
- Most papers (46/83, 55%) focused on the general population, 16/83 (19%) considered IDP, 15/83 (18%) considered refugees, and 6/83 (7%) included more than one population type.
- Most papers (45/83, 54%) considered both urban and rural settings, 34/83 (41%) considered only the rural setting, and 4/83 (5%) considered only the urban environment.
- Regarding the types of public health interventions, 68/83 (82%) articles used health assessment methods for care planning. 9/83 (11%) articles assessed health in the context of the use of existing health services. 3/83 (4%) articles studied health assessment methods to inform aspects of disaster preparedness.
- Excess mortality and morbidity was the health topic most assessed in these studies (26/83, 31%), followed closely by nutrition and food security (25/83, 30%). 19/83 (23%) studies assessed mental health, 8/83 (10%) assessed basic or general health, and 3/83 (4%) focused on population estimation.
A large array of different health assessment methods was studied covering a range of health topics. Within each health topic, there was little consistency in the assessment methods used with the exception of two health topics: nutrition and mental health. Of the nutritional assessment methods, anthropometric measurements (such as weight-for-height in children) were almost universally used. Of the mental health assessment methods, several assessment scales or checklists were used in more than one study: the Hopkins Symptoms Checklist was used in five studies, and the Harvard Trauma Questionnaire, Depression Self-Rating Scale, SF-36 Health Survey and Afghan Symptom Checklist (ASCL) were each used in two studies.

Concerning stage of crisis, 42/83 (51%) studies focused on the acute phase, 13/83 (16%) on early recovery, and 28/83 (34%) on chronic situations.

5.3.2 Expert Interviews

Key findings from the expert interviews were as follows:

Priority gaps in the available evidence on health assessment methods which need to be filled include:

- Mortality estimates of crisis-affected populations.
- Identification of vulnerable populations.
- Burden of chronic disease.
- Reliable direct data gathering from end-users.
- Victim interview methodologies.
- Numbers of humanitarian workers involved in a crisis situation.
- The humanitarian system’s ‘fitness-for-purpose’ for addressing health needs in a crisis situation.
- Appropriate indicators with which to measure humanitarian contextual factors.
- Long-term impact assessment methodologies.
- Consensus-building on the interpretation of assessment tools.
- Assessment data management and security.
- Certain populations experiencing crisis, including adolescents, the disabled, the elderly, those with chronic disease, and urban refugees.

**Issues related to the type of crisis and health assessment methods:**

- Despite significant data gathering and study of this contextual factor in the acute phase of crises, the application of available evidence in all types of crises has been limited largely due to a lack of consensus on the interpretation of assessment tools.

**Type of studies needed:**

- Randomised and controlled trials would be an impractical, unfeasible and unethical means of seeking evidence on this contextual factor.
- The greatest source of shared knowledge likely lies within the grey literature but the extent to which this can be used as scientific evidence is highly variable and its usefulness is seen to be dependent on the reputation of the agency producing it.
- By nature, innovations aimed at systemic transformative change need to transcend evidence-based interventions and therefore the quest for evidence must itself be carefully directed.

**Use of guidelines and standards in the study or programmatic development of accountability to end-users:**

- Existing institutional guidelines of the agencies or organisations within which humanitarian workers operate are the most widely used standards for this contextual factor.
Other guidelines and standards which are particularly useful include: (i) Sphere Project standards, (ii) ALNAP guidelines, (iii) CDC guidelines, (iv) UNICEF guidelines, (v) WHO guidelines, (vi) policy statements of agencies, and (vii) informal peer advice.

Other than the Institutional Review Board (IRB) process, there are very few standardised ethical guidelines in the field of humanitarian research and programmatic development.

There was very good consensus on the perceived research gaps in this contextual factor among the humanitarian experts interviewed. The areas where there was a lack of consensus were in the health assessment methods involving (i) direct data gathering from end-users and (ii) victim interview methodologies, where only a minority of experts believed these to be research priorities.

5.3.3 Recommendations for future research

- More quality research is needed on the development, comparison, testing and validation of health assessment methods.
- Greater research attention should therefore be given to the impact of different health assessment methodologies on the effectiveness of public health interventions during humanitarian crises.
- More evidence is needed in a number of areas: (i) mortality estimates of crisis-affected populations, (ii) identification of vulnerable populations, (iii) burden of chronic diseases, and (iv) indicators with which to measure humanitarian contextual factors.

References: Health assessment methods


5.4 Coordination

5.4.1 Systematic review

- The search strategy on this contextual factor captured 662 peer-reviewed articles, the vast majority of which (637) either did not discuss humanitarian crises or did not consider the impact of coordination on a public health intervention during crisis.

- There is little available evidence assessing the impact of coordination on the effectiveness of health interventions during humanitarian crises (25 papers).

- There is increasing interest in the characterisation of the impact of coordination on healthcare interventions during humanitarian crises, with 22/25 (88%) of all studies conducted since 1980 being published in the last decade.

- The majority of available evidence is of low to moderate quality: 13/25 (52%) of papers were from category C evidence, 8/25 (32%) were from category B, and only 4/25 (16%) were from category A.

- All studies were observational. All studies were purely descriptive, a study design very low down in the hierarchy of evidence. Only one of these was comparative, comparing two humanitarian information coordination bodies.

- Of the location-identified research on coordination during humanitarian crises, Haiti and Pakistan were the most commonly studied countries (4/25, 16% papers each). A further 10/25 (40%) papers considered multiple (more than two) different countries across regions.

- Evidence for the different types of humanitarian crises focused primarily on natural disasters: 10/25 (40%) considered these, in particular earthquakes, floods and tsunamis. 8/25 (32%) considered armed conflict only, and 7/25 (28%) considered both armed conflict and natural disasters.

- Most papers (21/25, 84%) focused on the general population; 2/25 (8%) considered entrapped populations, one paper considered IDPs only, and one paper considered both IDPs and refugees.

- Most papers (21/25, 84%) considered both urban and rural settings, 4/25 (16%) considered only the rural setting, and no studies considered only the urban environment.

- Regarding the types of public health interventions, 14/25 (56%) articles considered the coordination of international medical assistance agencies with existing health services. 9/25 (36%) further articles considered the coordination of only international medical assistance agencies. Just 2/25 (8%) studies considered the coordination of only domestic humanitarian capabilities (both were conducted in China).

- Of the available evidence on health coordination during humanitarian crises, 9/25 (36%) studies considered the UN OCHA and Cluster Approach systems, and 3/25 (12%) studies considered civil-military coordination. The majority of remaining papers (10/25, 40%) explored various domains of coordination which could be improved to increase the overall effectiveness of coordination during humanitarian crises, including: institutional and social networks (4 papers), trust between agencies (2), disaster preparedness and response (1), information management (1), logistics (1), and operational security (1).

- Basic, general and primary healthcare services together formed the public healthcare area most studied regarding coordination during humanitarian crises (21/25, 84%). Of the remaining studies, there was one article written on each of the following health areas: hospital inpatient and surgical care; patient medical transfers; distribution of medical materials; and sexual and reproductive health.

- Concerning stage of crisis, the majority (16/25, 64%) of studies focused on the acute phase, only 1/25 (4%) on early recovery, and 8/25 (32%) on chronic situations.
5.4.2 Expert Interviews

**Key findings from the expert interviews were as follows:**

Priority gaps in the available evidence on coordination which need to be filled include:

- OCHA’s ‘fitness-for-purpose’ for addressing health needs
- Non UN/OHCA-centric mechanisms of coordination
- Impact of integrated UN missions on healthcare delivery
- Role of UNHCR in the coordination of healthcare delivery to IDPs and refugees
- How international communities coordinate with local government
- Advantages and disadvantages of pooled funding within the UN structure
- Cost-benefit analysis of coordination of humanitarian public health interventions
- Role of generating competitive market forces between agencies in improving coordination and healthcare delivery efficiency
- Certain populations experiencing crisis, including adolescents, the disabled, the elderly, those with chronic disease, IDP and refugees, and urban populations.

**Issues related to the type of crisis and coordination:**

- Gathering evidence and the study of this contextual factor is most limited and difficult in the context of armed conflict.

**Type of studies needed:**

- Randomised and controlled trials would be an impractical, unfeasible and unethical means of seeking evidence on this contextual factor.
- The greatest source of shared knowledge likely lies within the grey literature but the extent to which this can be used as scientific evidence is highly variable and its usefulness is seen to be dependent on the reputation of the agency producing it.
- By nature, innovations aimed at systemic transformative change need to transcend evidence-based interventions and therefore the quest for evidence must itself be carefully directed.

Use of guidelines and standards in the study or programmatic development of access to healthcare:

- The IASC guidelines are the most widely used standards for this contextual factor.
- Other guidelines and standards which are particularly useful include: (i) UNEG (UN Evaluation Group) norms and standards, (ii) ALNAP guidelines, (iii) International Crisis Group (ICG) reports, (iv) existing institutional guidelines, (v) policy statements of agencies, and (vi) informal peer advice.
- Other than the Institutional Review Board (IRB) process, there are very few standardised ethical guidelines in the field of humanitarian research and programmatic development.

There was excellent consensus on the perceived research gaps in this contextual factor among the humanitarian experts interviewed. The area where there was a lack of consensus was in the role of UNHCR in the coordination of healthcare delivery to IDPs and refugees, where only a minority of experts believed this to be a research priority.
5.4.3 Recommendations for future research

General:
- Greater research is needed to understand the impact that coordination has on public health interventions during armed conflict.
- Greater research attention should be given to the cost-benefit analysis of coordination of humanitarian public health interventions.
- More research is needed into mechanisms and policies that safeguard or improve coordination during humanitarian crises.
- Evidence is needed to understand OCHA’s ‘fitness-for-purpose’ for helping to address health needs.

Integration with local systems
- More evidence is needed on the impact of integrated UN missions on healthcare delivery.
- More research is required to analyse how international communities coordinate with local government.

Comparing different coordination mechanisms
- High quality comparative studies are needed to inform how coordination influences public health interventions, in particular the comparison of health interventions under varying levels of coordination; international vs. purely local/domestic mechanisms of coordination; urban vs. rural settings; and in natural disasters vs. armed conflict.
- There is a need for research into the characterisation and influence of different aspects of coordination on public healthcare interventions, including coordination of information and its management; logistics; human and material resources; technologies; and institutional, trust and social networks.
- Greater research attention could be given to the advantages and disadvantages for health of pooled funding within the UN structure.

References: Coordination


596. McCann, D.G.C. and H.P. Cordi, Developing international standards for disaster preparedness and response: How do we get there? World Medical and Health Policy, 2011. 3(1).


5.5 Security of healthcare workers

5.5.1 Systematic review

- The search strategy on this contextual factor captured a modest number of related peer-reviewed articles (344), the vast majority of which (328) either did not discuss humanitarian crises or did not consider the impact of security of healthcare workers on a public health intervention during crisis.

- There is very limited available evidence assessing the impact of security of healthcare workers on the effectiveness of health interventions during humanitarian crises (16 papers).

- There is increasing interest in the characterisation of the impact of security of healthcare workers on health interventions during humanitarian crises, with 11/16 (69%) of all studies conducted since 1980 being published in the last decade.

- The large majority of available evidence is of low to moderate quality: 12/16 (75%) of papers were from category C evidence; 2/16 (13%) were from category B; and only 2/16 (13%) were from category A.

- All studies were observational. The large majority (14/16, 88%) were descriptive in design; the remaining (2/16, 13%) were cross-sectional. No studies were comparative.

- Of the location-identified research on the security of healthcare workers in humanitarian crises, Afghanistan, Iraq and Jordan had 2/16 (13%) articles specifically written on each of them; 1 article out of 16 (6%) studied Pakistan specifically. Indeed, these countries have been affected by some of the most violent armed conflicts in recent history. The remaining 9/16 (57%) studies considered multiple (more than two) different countries across regions.

- All studies considered the security of healthcare workers in armed conflict; of these, 3/16 (19%) studies also considered natural disasters.

- Nearly all papers (14/16, 88%) focused on the general population; just 2/16 (13%) considered only refugees. No studies considered only IDPs.

- Nearly all papers (14/16, 88%) considered both urban and rural settings; just 2/16 (13%) considered rural settings alone. There were no studies on urban settings alone.

- Evidence on the security of healthcare workers public health interventions during humanitarian crises concentrated around four main themes. The first, examined by 6/16 (38%) of the studies, is the different forms of violence faced by healthcare workers, including murder, gun violence, kidnappings and physical threats. The second theme, considered by 5/16 (31%) studies, is strategies on how security of healthcare workers could be improved. The third, considered by 3/16 (19%), is how violence against healthcare workers decimates health systems. Finally, 2/16 (13%) studies explored methods of measuring violence towards healthcare workers during humanitarian crises.

- Regarding the types of public health interventions 10/16 (63%) articles considered security of healthcare workers in settings of international medical assistance or existing services supplemented by international intervention. The remaining articles (6/16, 38%) considered security of healthcare workers in local existing medical services only.

- Basic, general, emergency and primary healthcare services together formed the public healthcare area most studied regarding security of healthcare workers (15/16, 94%). One paper considered the health topic of obstetric services specifically.

- Concerning stage of crisis, 4/16 (25%) studies focused on the acute phase, none (0%) on early recovery, and the vast majority (8/16, 75%) on chronic situations.
5.5.2 Expert Interviews

Key findings from the expert interviews were as follows:

Priority gaps in the available evidence on security of healthcare workers which need to be filled include:

- Increased risks posed by integrated UN missions.
- Impact of using foreign over local healthcare workers.
- Identification of risk factors associated with security threats to healthcare workers.
- Impact of asymmetry of power within a conflict setting on security.
- Impact of international involvement on security.
- Impact of religious context on security.
- Impact of end-user perception on security.
- Political role of healthcare worker kidnappings in conflict negotiation.
- Certain populations experiencing crisis, including adolescents, the disabled, the elderly, those with chronic disease, and urban refugees.

Issues related to the type of crisis and security of healthcare workers:

- Gathering evidence and the study of this contextual factor is difficult in the context of armed conflict since this in itself may be dangerous to the investigator.

Type of studies needed:

- Randomised and controlled trials would be an impractical, unfeasible and unethical means of seeking evidence on this contextual factor.
- The greatest source of shared knowledge likely lies within the grey literature but the extent to which this can be used as scientific evidence is highly variable and its usefulness is seen to be dependent on the reputation of the agency producing it.
- By nature, innovations aimed at systemic transformative change need to transcend evidence-based interventions and therefore the quest for evidence must itself be carefully directed.

Use of guidelines and standards in the study or programmatic development of access to healthcare:

- The (i) Geneva Conventions and (ii) existing institutional guidelines of the agencies or organisations within which humanitarian workers operate are the most widely used standards for this contextual factor.
- Other guidelines and standards which are particularly useful include: (i) IASC guidelines, (ii) ALNAP guidelines, (iii) International Crisis Group (ICG) reports, (iv) policy statements of agencies, and (v) informal peer advice.
- Other than the Institutional Review Board (IRB) process, there are very few standardised ethical guidelines in the field of humanitarian research and programmatic development.

There was excellent consensus on the perceived research gaps in this contextual factor among the humanitarian experts interviewed. The area where there was a lack of consensus was in the political role of healthcare worker kidnappings in conflict negotiations, where only a minority of experts believed this to be a research priority.
5.5.3 Recommendations for future research

- There needs to be more research on how healthcare worker security influences the effectiveness of public health interventions in humanitarian crises.
- High quality comparative studies are needed to inform how security influences health interventions and outcomes, in particular comparing crises of varying security levels, crises in urban vs. rural settings, and crises with international vs. purely local or domestic health assistance.
- Further evidence is needed on the impact on public health interventions of: (i) increased risks posed by integrated UN missions, (ii) using foreign over local healthcare workers, (iii) risk factors associated with security threats to healthcare workers, (iv) religious context on security, (v) the impact of end-user perception on security.

References: Security of health care workers


5.6 Urbanisation

5.6.1 Systematic review

- The search strategy on this contextual factor captured a large number of related peer-reviewed articles (3141), the vast majority of which either did not discuss humanitarian crises or did not consider the impact of urbanisation on a public health intervention during crisis.

- There is little available evidence assessing the impact of urbanisation on the effectiveness of healthcare interventions during humanitarian crises (27 papers).

- There is increasing interest in the identification of health challenges particular to humanitarian crises in urban settings and the development of appropriate policies to address these, with 24/27 (89%) of all studies conducted since 1980 being published in the last decade.

- The majority of available evidence is of low to moderate quality: 7/27 (26%) of papers were from category C evidence, 9/27 (33%) were from category B, and 11/27 (41%) were from category A.

- All studies were observational. 17/27 (63%) of studies were purely descriptive in design and of these four were comparative. The remaining 10/27 (37%) employed a cross-sectional design and of these also four were comparative. Of all the comparative studies, 5/8 (63%) compared urban with rural settings, 2/8 (25%) compared general and IDP populations within urban settings, and one study compared two computer models to predict flood extent in an urban setting.

- The majority of location-identified research on the influence of urbanisation on humanitarian crises was conducted in Asia (12/27, 44%), possibly due to the fact that Asia has been projected to lead the urban population growth over the coming decades and it is also the geographic region of the world most prone to natural disasters. 6/27 (22%) further studies considered urban settings across multiple different countries and regions.

- Evidence for the different types of humanitarian crises focused heavily on natural disasters: 16/27 (59%) considered these, in particular floods (6/16) and earthquakes (6/16); 7/27 (23%) considered armed-conflict; and one paper evaluated both natural disasters and armed-conflict. A third and distinct category of humanitarian crisis – situations of “urban violence” – was identified by the literature: 3/27 (11%) focused specifically on this environment.

- Most papers 22/27 (81%) considered the general population, 2/27 (7%) considered both the general population and IDPs, and one (4%) considered only IDPs. 2/27 (7%) of papers considered refugee populations.

- As defined by this contextual factor, all papers considered urban settings. Of these, 6/27 (22%) considered rural settings in addition, and 5/6 (83%) of these conducted comparative analysis between these two environments. 3/27 (11%) further papers specifically identified the urban setting of study as “slums”.

- Evidence for the influence of urbanisation on public health interventions during humanitarian crises concentrated around three main themes. The first, identified in 7/27 (26%) of studies, is the relative greater vulnerability of urban environments to excess mortality as a result of both natural disasters such as floods and droughts, as well as armed conflict. The second theme, identified in 7/27 (26%) further studies, are the particular health challenges faced by urban environments during humanitarian crises, including access to healthcare; collapse of the health system and the management of NCDs; food security; sanitation and diarrhoeal disease; and the detrimental impact of poverty on health. Thirdly, 3/27 (11%) studies identified a relatively greater capacity of urban environments for recovery in the areas of health access, mental health and urban infrastructure.

- Regarding the types of public health interventions, 13/27 (48%) articles focused on care planning, 9/27 (33%) on disaster preparedness, 3/27 (11%) on use of existing health services, and 2/27 (7%) on a combination of these interventions.
Access to healthcare was the health-related topic most studied regarding urbanisation (10/27, 37%). 5/27 (19%) studies considered mental health, 5/27 (19%) considered nutrition and food security, 3/27 (11%) considered water, sanitation and hygiene, and 2/27 (7%) considered NCDs.

Concerning stage of crisis, only 4/27 (15%) of studies focused on the acute phase, 5/27 (19%) on early recovery, and the vast majority (18/27, 67%) on chronic situations.

5.6.2 Expert Interviews

Key findings from the expert interviews were as follows:

**Priority gaps in the available evidence on urbanisation which need to be filled include:**

- Meaningful indicators for the measurement of urban health, including ones which are location-specific, able to differentiate between health states arising out of chronic deprivation and acute crisis, and able to measure associated tipping points or threshold criteria.
- Optimal methods of integrating humanitarian health interventions into existing urban healthcare infrastructures.
- Strategies to improve the baseline health status and robustness of health systems in rapidly urbanising populations to mitigate the detrimental health impacts of crises.
- Civil engineering and urban planning directed towards disaster preparedness, prevention and mitigation.
- Management of chronic disease during collapse of health systems in urban settings.
- Community-based humanitarian healthcare interventions.
- Monitoring and surveillance methodologies of health in urban settings.
- Efficient methods in the identification of and targeted intervention in specific populations (e.g. IDPs, refugees, women) within non-camp urban settings.
- Slum populations.
- Estuarine populations.
- Populations living on landslide prone or soft land areas unsuitable for urbanisation.

**Issues related to the type of crisis and coordination:**

- Gathering evidence and the study of this contextual factor is most limited and difficult in the context of armed conflict, other situations of urban violence and where there is a lack of social capital between researchers and affected communities.

**Type of studies needed:**

- Randomised and controlled trials would be an impractical, unfeasible and unethical means of seeking evidence on this contextual factor. However, stratification of data by similarities of interest in neighbourhoods and communities for comparative analysis is needed.
- The greatest source of shared knowledge likely lies within the grey literature but the extent to which this can be used as scientific evidence is highly variable and its usefulness is seen to be dependent on the reputation of the agency producing it. Grey literature can be very location specific which can be particularly useful.
- By nature, innovations aimed at systemic transformative change need to transcend evidence-based interventions and therefore the quest for evidence must itself be carefully directed.

**Use of guidelines and standards in the study or programmatic development of access to healthcare:**

- Government statistics are the most widely used standards for this contextual factor, although it is acknowledged that they can be technically inaccurate or reflect a political agenda.
Other guidelines and standards which are particularly useful include: (i) UN Habitat reports and guidelines, (ii) IASC guidelines, (iii) ALNAP guidelines, (iv) existing institutional guidelines, (v) policy statements of agencies, and (vi) informal peer advice.

Other than the Institutional Review Board (IRB) process, there are very few standardised ethical guidelines in the field of humanitarian research and programmatic development.

There was excellent consensus on the perceived research gaps in this contextual factor among the humanitarian experts interviewed. The area where there was a lack of consensus was in the importance put on the need for evidence in the management of chronic disease during collapse of health systems in urban crises, where a minority of experts believed this to be an over-emphasised research priority reflecting a current vogue.

5.6.3 Recommendations for future research

- Research is needed to analyse the influence of further aspects particular to urbanised environments on public health interventions, including:
  - Opportunities for disaster preparedness
  - Opportunities for coordination
  - Civil engineering and urban planning in disaster prevention and mitigation
  - Opportunities for the use of social media and other forms of mass communication
  - Opportunities for the control of infectious disease outbreaks.
- Efficient research methods of identification and targeted intervention of IDP and refugee populations within non-camp urban settings are needed.

References: Urbanisation

640. Mullen, P.M.D., Protracted conflict, economic status and health services as determinants of health outcomes among the general population in Burundi, 2008, ProQuest Information & Learning: US.
ANNEX 1:
LIST OF KEY CONTRIBUTORS TO THE PROJECT

Principal Investigators: Karl Blanchet and Bayard Roberts (LSHTM)

Co-investigators: Vera Sistenich (Harvard) and Mazeda Hossain (LSHTM)

Advisor: Sara Pantuliano (ODI)

Researchers (by topic):
Anita Ramesh (Communicable disease control; water, sanitation and hygiene)
Séverine Frison (Nutrition)
James Smith (Nutrition; communicable disease control)
Emily Warren (Sexual and reproductive health (SRH), including maternal health, gender-based violence)
Mazeda Hossain (SRH, including maternal health, gender-based violence)
Bayard Roberts (Mental health and psychosocial support)
Maysoon Dahab (Mental health and psychosocial support)
Aniek Woodward (Mental health and psychosocial support)
Abigail Knight (Noncommunicable diseases; health service delivery)
Karl Blanchet (Injury and physical rehabilitation; Health systems; Health service delivery)
Chris Lewis (Health systems)
Vera Sistenich (Contextual factors of health care access, accountability, health assessment methods, coordination, health worker security, and urbanisation)

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Claude Bruderlein, Harvard School of Public Health (HSPH)
Joanna Cairncross, LSHTM
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Allen Foster, LSHTM
Peter Smith, LSHTM
Martin McKee, LSHTM
Deirdre Beecher, LSHTM
Jeroen Ensink, LSHTM

Project Steering Committee:
Chris Whitty (DFID)
Jimmy Whitworth (The Wellcome Trust)

Project Management Committee:
Chris Lewis (UK Department for International Development, DFID)
Val Snewin (The Wellcome Trust)
Daniel Davies (ELRHA)
Jessica Camburn (ELRHA)
Francesco Checchi (Save the Children UK)
Figure 55: Project Structure
ANNEX 2:
LIST OF EXPERT INTERVIEWEES

Consultancy meetings (all topics):

Paris:
Pierre Salignon, Médecins du Monde, France
Jean-Hervé Bradol, CRASH, Foundation Médecins Sans Frontières, France
Myriam Aissa, Action contre la Faim, France
Cécile Salpeteur, Action contre la Faim, France
Sevan Khadeej, WAHA, France
Boris Martin, Humanitaire, France

Geneva:
Paul Spiegel, UNHCR, Switzerland
Micel Yao, WHO, Switzerland
Nenette Motus, IOM, Switzerland
Kaisa Kontunen, IOM, Switzerland
Thierry Agagliate, Terre des hommes, Switzerland
Capucine Jacquier, Terre des hommes, Switzerland

London:
Louise Knight, Merlin, UK
Alice Fay, Save the Children, UK
Andrew Hall, Save the Children, UK
Bethan Lewis, Save the Children, UK
Kate Godden, Nutrition Works, UK
Anne Bush, Nutrition Works, UK
Victoria Sibsen, Independent, UK
David Bates, MoD, UK
Marcus Skinner, HelpAge, UK
Trudi Skinner, International Health Partner, UK
Natasha Lelijveld, UCL, UK
Andrew Seal, UCL, UK
Mamoun Abu-Anqub, Islamic relief, UK
Carla Stanke, Public Health England, UK
Saskia de Pee, WFP, The Netherlands
Claire Allen, Evidence Aid, UK
Amy Hughes, UKIETR UKMed, UK
Emily Mates, ENN, UK
Margaret Lancaster, Concern Worldwide, UK
Peter Medway, International Medical Corps, UK

Topic specific (by telephone or in-person):

Communicable Disease Control:
Muireann Brennan, CDC, USA
David Bates, Ministry of Defence, UK
David Heymann, LSHTM and Chatham House, UK
Heather Papowitz, UNICEF, USA
Toby Leslie, LSHTM, UK
Farooq Mansoor, Health Protection and Research Organization, Afghanistan
Ismail Mayen, Health Protection and Research Organization, Afghanistan
Asif Alokozai, Health Protection and Research Organization, Afghanistan

WASH
Andy Bastabale, Oxfam, UK
Sandy Cairncross, LSHTM, UK
Jeroen Ensink, LSHTM, UK
Paul Shanahan, UNICEF/Global WASH Cluster

Nutrition
Cécile Salpeteur, Action Contre la Faim, France
Emmanuel Baron, Epicentre, France
Jay Berkeley, KEMRI Wellcome Trust, Kenya
Jeremy Shoham, Emergency Nutrition Network, UK
Kate Sadlers, Valid International, UK
Marie McGrath, Emergency Nutrition Network, UK
Marko Kerac, Malawi College of Medicine/UCL, Malawi
Myriam Alissa, Action Contre la Faim, France
Oleg Bilukha, CDC, USA
Rebecca Grais, Epicentre, France
Saul Guerrero, Action Against Hunger, UK

Reproductive health and gender-based violence
Basia Tomczyk, CDC, USA
Bethan Cobley, Marie Stopes International, UK
Catrin Schulte-Hillen, MSF, France
Chris Orach, Makerere University, Uganda
Emma Simpson-Independent Consultant, UK
Farhad Javid, Marie Stopes International, Afghanistan
Gina L. Bramucci, IRC, France
Julie Taft, Independent Consultant, UK
Lisa Jane Thomas, Department of Reproductive Health and Research, WHO, Switzerland
Lydia Ettema, Marie Stopes International, Belgium
Mairi MacRae, IRC, UK
Mihoko Tanabe, Women’s Refugee Commission, USA
Nadine Cornier, UNHCR, Switzerland
Natasha Howard, LSHTM, UK
Pam DeLargy, UNFPA, Sudan
Samira Sami, CDC, USA

Mental health and psychosocial support
Ananda Galappatt, MHPSS network, University of Colombo, Sri Lanka
Barbara Lopes-Cardozo, CDC, USA
Cécile Bizouerne, ACF, France
Derrick Silove, University of New South Wales, Australia
Florence Baingana, Makerere University, Uganda
Grace Akello, Gulu University, Uganda
Inka Weissbecker, IMC, Ethiopia
Karen Abbs, consultant, UK.
Lynne Jones, consultant, UK
Mahesan Ganesan, Global Initiative on Psychiatry, Sri Lanka
Mark Jordans, HealthNet TPO, Netherlands
Mark Van Ommeren, WHO, Switzerland
Paul Bolton, Johns Hopkins University, USA
Peter Ventevogel, consultant, Netherlands
Pierre Bastin, ICRC, Geneva
Robert van Voren, Global Initiative on Psychiatry, Netherlands
Wietse Tol, Johns Hopkins University, USA

NCDs
Pascale Fritsch, HelpAge International, UK
Richard Garfield, CDC, USA
Peter Lamptey, FH360, USA
Louise Lillywhite, Chatham House, UK
Dorothea Nitsch, LSHTM, UK
Neil Pearce, LSHTM, UK
Marcus Skinner, HelpAge International, UK
Richard Sullivan, Kings Health Partners, UK

Injury and physical rehabilitation
Jim Gosner, The International Society of Physical and Rehabilitation Medicine, USA
Barbara Rau, ICRC, Switzerland
Claude Tardiff, ICRC, Switzerland
Isabelle Urseau, Handicap International, France
Valerie Scherrer, CBM, Belgium
Jan Reinhardt, The International Society of Physical and Rehabilitation Medicine, Switzerland
Alana Officer, WHO, Switzerland

Health services and systems
Egbert Sondorp, Royal Tropical Institute, the Netherlands.
Emily Ying Yang Chan, Hong Kong University
Preeti Patel, King’s College London
Sarah Hersey, CDC, South Sudan
Ann Cannavan, International Medical Corps, USA
Philip Du Cros, MSF, UK
Beverly Collin, MSF, UK

Contextual factors
Abby Stoddard, Humanitarian Outcomes, USA
Barnaby Willitts-King, Independent Consultant, USA
Colleen Hardy, CDC, USA
Elizabeth Ferris, Brookings Institution, USA
Hansjoerg Strohmeyer, UN OCHA, USA
Iain Levine, Human Rights Watch, USA
James Shepherd-Barron, Independent Consultant, USA
Jeremie Labbe, International Peace Institute, USA
Mark Steinbeck, ICRC, USA
Peter Walker, Feinstein International Center, USA
Ronak Patel, Harvard Humanitarian Initiative, USA
Ruwan Ratnayake, International Rescue Committee, USA
Sophie Delaunay, MSF, USA
ANNEX 3: SEARCH TERMS USED FOR KEY BIBLIOGRAPHIC DATABASES

(see Annexes for health topic specific search terms which were added on to these)

1. exp Disasters
2. exp Relief Work
3. Rescue Work
4. Emergencies
5. Emergency Medicine
6. Emergency Medical Services
7. Disaster Medicine
8. Mass Casualty Incidents
9. Emergency Responders
10. Medical Missions, Official
11. (humanitarian adj2 (crisis or crises or relief or response or agenc$)).tw.
12. humanitarian.tw.
13. (disaster adj3 (relief or plan$)).tw.
14. ((relief or aid) adj2 work$).tw.
15. Refugees
16. (refugee or evacuee or evacuated).tw.
17. (displace$ adj2 (force$ or population or human or internal$)).tw.
18. Altruism
19. exp War
20. war.tw.
21. ((armed or zone) adj2 conflict$).tw.
22. (conflict affected adj3 (population$ or person$ or communit$)).tw.
23. Avalanches
24. Earthquakes
25. Floods
26. Landslide
27. Tidal Waves
28. Tsunamis
29. Cyclonic Storms
30. (typhoon$ or hurricane$ or cyclone$).tw.
31. (avalanche$ or earthquake$ or flood or floods or flooding or flooded or landslide$ or tsunami$).tw.
32. (disaster adj2 (natural or victim)).tw.
33. Droughts
34. drought$.tw.
35. Starvation
36. (starvation or famine$).tw.
37. or/1-36
38. randomized controlled trial
39. controlled clinical trial
cross-sectional studies

case-control studies

cohort studies

pilot studies

(random$ or controlled).tw.

(control adj3 (area or cohort? or compare? or condition or design or group? or intervention? or participant? or study?)).ab. not (controlled clinical trial or randomized controlled trial).pt.

((evaluat$ or prospective or retrospective) adj1 study).tw.

("quasi-experiment$" or quasiexperiment$ or "quasi random$" or quasirandom$ or "quasi control$" or quasicontrol$ or ((quasi$ or experimental) adj3 (method$ or study or trial or design$))).tw.

("time series" adj2 interrupt$).tw.

(intervention$ or impact or effectiveness or efficacy or service$ or outcome$ or output or treatment$ or management or program$ or project$).tw.

economics

cost-benefit analysis

cost control

Cost savings

cost of illness

cost $utility.tw.

(Cost$ adj2 effective$).tw.

cost-effective$.tw.

(cost adj3 utility).tw.

cost-utilit$.tw.

or/38-59

developing countries

exp asia

exp africa

exp pacific islands

exp eastern europe

exp china

balkan peninsula/ or europe, eastern/ or transcaucasia

caribbean region/ or central america/ or “gulf of mexico”/ or latin america/ or south america

atlantic islands/ or indian ocean islands/ or macau/ or pacific islands/ or philippines/ or prince edward island/ or svalbard/ or west indies

or/61-69

Japan

70 70 not 71

37 and 60 and 72

limit 73 to yr="1980 -2013"
ANNEX 4:
DETAILS FOR SYSTEMATIC REVIEW ON COMMUNICABLE DISEASE CONTROL

Sources:
Published literature: Embase, Global Health, Medline.
Grey literature: R4D, MSF Field Research, UNHCR, WaterAid, SHARE, WHO, United States Center for Disease Control and Prevention (CDC).

Health topic specific search terms:
'Communicable disease' or 'infectious disease' or 'infection' or 'zoonoses' or 'environmental microbiology' or 'virus diseases' or 'viral diseases' or 'virus infections' or 'viral infections' or 'bacteria diseases' or 'bacterial diseases' or 'bacteria infections' or 'bacterial infections' or 'parasite diseases' or 'parasitic diseases' or 'parasite infections' or 'parasitic infections' or 'diarrhoeal diseases' or 'diarrheal diseases' or 'respiratory infections' or 'acute respiratory infections' or 'malaria' or 'tuberculosis' or 'TB' or 'HIV' or 'AIDS' or 'acquired immune deficiency syndrome' 'sexually-transmitted diseases' or 'STDs' or 'sexually transmitted infections' or 'STIs' or 'vaccine preventable diseases' or 'measles' or 'meningitis' or 'cholera' or 'typhoid' or 'shigellosis' or 'hepatitis' or 'dengue' or 'malaria' or 'leptospirosis' or 'scabies' or mycosis or viruses or bacteria or parasites or helminthes or worms or fungi or 'microorganism or micro-organism or 'pathogens' or 'pathogenic, virus' or viral, bacteria, fungi, fungal, fungus, mould, mycoses, parasite, incidence, prevalence, epidemic, seroepidemiological, occurrence, seroprevalence, exposure, exposed, aetiology, burden or risk, emerging, risk-factors, risk-assessment.
### Summary data extraction table:

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ANNEX 5:
DETAILS FOR SYSTEMATIC REVIEW ON COMMUNICABLE DISEASE CONTROL

Sources:
Published literature: Embase, Global Health, Medline.
Grey literature: R4D, MSF Field Research, UNHCR, UN-Habitat, WaterAid, SHARE, UN-Water
Secretariat of the United Nations Convention to Combat Desertification (UNCCD), UNDP, UNEP,
UN International Strategy for Disaster Reduction (UNISDR), International Water Resources Association (IWRA), Global
Water Partnership, International Water Association (IWA), Public Services International (PSI), Gender and Water
Alliance (GWA), Women for Water Partnership, Conservation International, Water.org, UN International Groundwater,
Resources Assessment Centre (IGRAC).

Health topic specific search terms:
"Water" or "water supply" or "water source" or "body of water" or "water bodies" or "drinking water" or "fresh
water" or "water pollutants" or "sanitation" or "septic tank" or "latrine" or "pit latrine" or "public water" or "private
water" or "domestic water" or "toilet" or "feces" or "faeces" or "defecation" or "hygiene" or "WASH" or "watsan" or
"drainage" or "latrine" or "septic tank" or "hygiene" or "hand washing" or "handwashing" or "hand hygiene" or "soap"
or "detergent" or "bore well" or "borewell" or "point of use" or "water provision" or "faecal-oral disease" or "faecal-
oral disease" or "hygiene promotion" or "open defecation" or "flying latrines" or "interagency plastic slab" or "Oxfam
bucket" or "water table" or "faecal sludge" or "waste disposal" or "waste treatment"

Stage 1: Peer reviewed literature: electronic database search (N=3963)
1314 excluded
(duplicates)

Stage 2a: Peer reviewed literature: title/abstract review (N=2649)
2641 excluded
(non topic)

Stage 2b: Peer reviewed literature (N=8)

Stage 3: Grey literature (N=0)

Stage 4: Peer reviewed and grey literature (N=8)
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ANNEX 6:
DETAILS FOR SYSTEMATIC REVIEW ON NUTRITION

Sources:
Published literature: Embase, Global Health, Medline.
Committee on Nutrition, CMAM forum, The International Lipid-Based Nutrient Supplements Project, the e-Library of
Evidence for Nutrition Actions, Humanitarian Practice Network.

Health topic specific search terms:
Malnutrition or under-nutrition or nutrition or malnourished or wasted or wasting or ((arm or midarm or mid-
arm or mid-upper arm) and circumference) or MUAC or weight-for-height or weight-for-length or WHZ or WHM
or weight- for- age or WAZ or height- for-age or HAZ or kwashiorkor or nutritional deficiency or nutrition disorder
or protein-energy malnutrition or starvation or hunger or micronutrient deficiency or food fortification or vitamin
or multi-micronutrient sprinkles or scurvy or vitamin C deficiency or pellagra or niacin deficiency or beriberi or
thiamine deficiency or goitre or iodine deficiency or breastfeeding or complementary food or nutrition assessment
or nutrition survey or nutrition surveillance or malnutrition prevalence or supplementary feeding or selective
feeding or therapeutic feeding or feeding centre or stabilisation centre or outpatient therapeutic care or outpatient
therapeutic programme or therapeutic food or ready-to-use therapeutic food or RUTF or ready to use supplementary
food or RUSF or lipid based supplement or fortified milk or high energy milk or vitamin mix or micronutrient powder
or mineral mix or food aid or food relief or general food distribution or general ration distribution or targeted food
distribution or cash or voucher.
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<td>Treatment of SAM</td>
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<td>Conflict/Disaster</td>
<td>Outcome</td>
<td>Intervention/Service</td>
<td>Study Design</td>
<td>Duration</td>
<td>Grade</td>
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<tr>
<td>Tansey et al (2007)</td>
<td>Sudan Rural IDP</td>
<td>Armed conflict</td>
<td>Acute Crises</td>
<td>Anaemia</td>
<td>Address micro-nutrient deficiencies</td>
<td>Follow-up</td>
<td>6 to 59 months</td>
<td>A</td>
<td></td>
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<tr>
<td>Taylor (1983)</td>
<td>Somalia</td>
<td>?</td>
<td>Acute crises</td>
<td>Acute malnutrition</td>
<td>TSFP</td>
<td>Follow-up</td>
<td>6 to 59 months</td>
<td>B</td>
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<td>Yekiste et al (2011)</td>
<td>Ethiopia Rural &amp; urban Refugee</td>
<td>Armed conflict</td>
<td>Stabilised/early recovery</td>
<td>Acute malnutrition</td>
<td>Treatment of SAM</td>
<td>Cost effectiveness</td>
<td>6 to 59 months</td>
<td>A</td>
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<td>Therry (2005)</td>
<td>Afghanistan Urban Refugee</td>
<td>Armed conflict</td>
<td>Stabilised/early recovery</td>
<td>Acute malnutrition</td>
<td>Treatment of SAM</td>
<td>Follow-up</td>
<td>6 to 59 months</td>
<td>B</td>
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<tr>
<td>Toole et al (1988)</td>
<td>Sudan &amp; Thailand Rural Refugee</td>
<td>Armed conflict</td>
<td>Acute crises</td>
<td>Acute malnutrition, Mortality</td>
<td>BSFP</td>
<td>6 to 59 months</td>
<td>B</td>
<td></td>
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</tr>
<tr>
<td>Vauter et al (1999)</td>
<td>Liberia, Burundi, DRC IDP &amp; general Rural &amp; urban</td>
<td>Armed conflict</td>
<td>Acute crises</td>
<td>Acute malnutrition</td>
<td>TSFP</td>
<td>Follow-up</td>
<td>6 to 59 months</td>
<td>B</td>
<td></td>
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<tr>
<td>Vazquez-Garcia (1998)</td>
<td>Kenya Rural &amp; urban IDP &amp; general</td>
<td>Armed conflict</td>
<td>Acute crises</td>
<td>Acute malnutrition</td>
<td>TSFP</td>
<td>Follow-up</td>
<td>6 to 59 months</td>
<td>B</td>
<td></td>
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<tr>
<td>Vincent et al (2007)</td>
<td>Thailand/Burma border Rural Refugee</td>
<td>Armed conflict</td>
<td>Under 6 years</td>
<td>Address micro-nutrient deficiencies</td>
<td>Cross-sectional</td>
<td>under 6 years to 12 years</td>
<td>C</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>WFP (1998)</td>
<td>Bosnia and Herzegovina General Armed conflict</td>
<td>GFD</td>
<td>Cross-sectional</td>
<td>GFD</td>
<td>Cross-sectional</td>
<td>C</td>
<td></td>
<td></td>
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</tbody>
</table>

Note: Empty cells are for C grade papers (low evidences category) as these were not evaluated in detail.
ANNEX 7:
DETAILS FOR SYSTEMATIC REVIEW ON NUTRITION

Sources:
Published literature: Embase, Global Health, and Medline.

Health topic specific search terms:
sexual health or sexual health or reproductive health or sexual and reproductive health or maternal health or maternal welfare or neonatal health or perinatal care or perinatal health or prenatal care/ or prenatal health or ante$natal health or post$natal health or post$part$ or newborn health or family planning or family planning or contraceptive$ or condom$ or pregnan$ or abortion or induced abortion or abort$ or birth or miscarriage or spontaneous abortion or still$b$ or Minimum Initial Service Package or obstetric$ or gyn$ecology or maternal welfare or safe motherhood or emergency obstetric $ care or EmO$C or safe delivery or skilled birth attend$ or sexually transmitted infection$ or sexually transmitted disease$ or HIV or Human immunodeficiency virus or AIDS or acquired immune deficiency syndrome or PMTCT or fistula or rectovaginal fistula or urethra fistula or fistula or urinary tract fistula or adolescent sexual health or adolescent reproductive health or genital trauma or genital injury or vaginal trauma or vaginal injury or gender$based violence or partner violence or family violence or violence against women or domestic violence or sexual abuse or sexual abuse or sex crime or sexual crime or domestic violence or domestic violence or sexual violence or rape or physical violence or rape or rape or intimate partner violence or partner violence or partner abuse or partner violence or partner violence or partner violence or partner violence or assault or physical assault or sexual assault or sexual crime or sexual harassment or sexual harassment or sexual coercion or forced sex or sexual slavery
Stage 1: Peer reviewed literature: electronic database search (N=7149)

Stage 2a: Peer reviewed literature: title/abstract review (N=5384)

Stage 2b: Peer reviewed literature (N=40)

Stage 3: Grey literature (N=2)

Stage 4a: Peer reviewed and grey literature (N=45)

Stage 4b: Peer reviewed and grey literature (N=31)

141 excluded (non-topic)

5344 excluded (non-topic)

1765 excluded (duplicates)

3 added through expert recommendations
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<th>Study authors (year)</th>
<th>Study country</th>
<th>Setting</th>
<th>Population type</th>
<th>Humanitarian crisis type</th>
<th>Crisis stage</th>
<th>Health outcome(s)</th>
<th>Type(s) of health intervention</th>
<th>Study design</th>
<th>Target age group</th>
<th>Evidence category</th>
</tr>
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<tbody>
<tr>
<td>Ahoua, L. (2010)</td>
<td>Uganda</td>
<td>Rural</td>
<td>General</td>
<td>Armed Conflict</td>
<td>Stabilised</td>
<td>Reduced MTCT, reduced neonatal deaths</td>
<td>PMTCT</td>
<td>Cohort</td>
<td>Women of Reproductive Age (WRA) and &lt;6 Months</td>
<td>A</td>
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<tr>
<td>Ayoya, M (2013)</td>
<td>Haiti</td>
<td>Urban/ Camp</td>
<td>IDP</td>
<td>Natural Disaster</td>
<td>Acute</td>
<td>Decreased infant morbidity, malnutrition, and mortality</td>
<td>Breast-feeding tents</td>
<td>Cross-Sectional</td>
<td>&lt;1 yrs</td>
<td>B</td>
</tr>
<tr>
<td>Carrara, V I. (2011)</td>
<td>Thailand</td>
<td>Rural/ Camp</td>
<td>Refugee</td>
<td>Armed Conflict</td>
<td>Early Recovery</td>
<td>Improved maternal &amp; new-born health</td>
<td>ANC clinic in camp; migrant ANC clinics</td>
<td>Cross-Sectional</td>
<td>WRA and &lt;6 Months</td>
<td>A</td>
</tr>
<tr>
<td>Casey, S. E (2013)</td>
<td>Uganda</td>
<td>Rural</td>
<td>IDP</td>
<td>Armed Conflict</td>
<td>Early Recovery</td>
<td>Family planning service provision</td>
<td>Mobile outreach, Public health centre strengthening</td>
<td>Cross-Sectional</td>
<td>WRA</td>
<td>C</td>
</tr>
<tr>
<td>Ciccio, L (2010)</td>
<td>Uganda</td>
<td>Rural</td>
<td>General</td>
<td>Armed Conflict</td>
<td>Early Recovery</td>
<td>Improved HIV knowledge, attitudes and practice</td>
<td>Adolescent prevention package; media campaign; peer counselling; life skills, youth activities</td>
<td>Cross-Sectional</td>
<td>10-19 yrs</td>
<td>B</td>
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<tr>
<td>Damme, W V. (1998)</td>
<td>Guinea</td>
<td>Rural</td>
<td>General</td>
<td>Armed Conflict</td>
<td>Stabilised</td>
<td>Improved OB outcomes</td>
<td>Free access to health services for refugees in host population hospital</td>
<td>Cross-Sectional</td>
<td>WRA</td>
<td>A</td>
</tr>
<tr>
<td>Dolan, G (1993)</td>
<td>Thailand</td>
<td>Camp</td>
<td>IDP</td>
<td>Armed Conflict</td>
<td>Stabilised</td>
<td>Reduced malaria incidence in pregnancy</td>
<td>Impregnated bed net provision</td>
<td>RCT</td>
<td>WRA</td>
<td>A</td>
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<tr>
<td>Leigh, B. (1997)</td>
<td>Sierra Leone</td>
<td>Urban</td>
<td>General</td>
<td>Armed Conflict</td>
<td>Early Recovery</td>
<td>Improved emergency obstetric care</td>
<td>Staff hired and trained, hospital facilities improved</td>
<td>Controlled Before-After</td>
<td>WRA and Adults (20-64 yrs)</td>
<td>B</td>
</tr>
<tr>
<td>McGinn, T (2006)</td>
<td>Guinea</td>
<td>Camp</td>
<td>Refugee</td>
<td>Armed Conflict</td>
<td>Early Recovery</td>
<td>Improved literacy skills, SRH, and child health</td>
<td>Health-based literacy classes</td>
<td>Controlled Before-After</td>
<td>WRA</td>
<td>B</td>
</tr>
<tr>
<td>Author</td>
<td>Year</td>
<td>Location</td>
<td>Type</td>
<td>Condition</td>
<td>Intervention</td>
<td>Study Design</td>
<td>Geographical Scope</td>
<td>Follow-up</td>
<td>Mental Health Issues</td>
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<td>Hustache, S.</td>
<td>2009</td>
<td>Congo</td>
<td>Economic Study</td>
<td>Stabilised</td>
<td>Improving access to EmOC, improving knowledge of danger signs, promoting use of health care for women and infants</td>
<td>Cross-Sectional</td>
<td>Adults</td>
<td>&lt;6 months</td>
<td>Psychological support to women who have been raped</td>
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<tr>
<td>Reid, T.</td>
<td>2008</td>
<td>Kenya</td>
<td>Economic Study</td>
<td>Stabilised</td>
<td>Using HAART comprehensive HIV programme, primary care clinic</td>
<td>Cross-Sectional</td>
<td>Adults</td>
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<td>Use of HAART</td>
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<td>Orach, C. G.</td>
<td>2007</td>
<td>Uganda</td>
<td>Economic Study</td>
<td>Stabilised</td>
<td>Comparing cost and cost-effectiveness of RH services for refugee and host populations</td>
<td>Cross-Sectional</td>
<td>Adults and Refugees</td>
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<td>Mental health status following conflict exposure</td>
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<td>Rutta, E.</td>
<td>2008</td>
<td>Tanzania</td>
<td>Urban</td>
<td>Stabilised</td>
<td>Implementing car and motorbike scheme to reduce delays in seeking care for OB emergencies</td>
<td>Controlled Before-After</td>
<td>Adults</td>
<td></td>
<td>Physical support to women who have been aged</td>
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<tr>
<td>Raheel, H.</td>
<td>2012</td>
<td>Pakistan</td>
<td>Urban</td>
<td>Stabilised</td>
<td>Improving health outcomes of women and girls</td>
<td>Cross-Sectional</td>
<td>Adults</td>
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<td>Improved reproductive health outcomes</td>
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<td>Samai, O.</td>
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<td>Tanzania</td>
<td>Urban</td>
<td>Stabilised</td>
<td>Providing STI/HIV/AIDS care, condom promotion, health promotion</td>
<td>Controlled Before-After</td>
<td>Adults</td>
<td></td>
<td>Psychological support to women who have been aged</td>
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<tr>
<td>Shaikh, M. A.</td>
<td>2008</td>
<td>Somaia</td>
<td>Urban</td>
<td>Stabilised</td>
<td>Creating GIS maps of camps to facilitate health visits</td>
<td>Controlled Before-After</td>
<td>Adults</td>
<td></td>
<td>Successful psychosocial intervention</td>
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<tr>
<td>Viswanathan, K.</td>
<td>2012</td>
<td>Afghanistan</td>
<td>Urban</td>
<td>Stabilised</td>
<td>Providing STI/HIV/AIDS care, condom promotion, health promotion</td>
<td>Controlled Before-After</td>
<td>Adults</td>
<td></td>
<td>Successful psychosocial intervention</td>
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<td>Bass, A.</td>
<td>2013</td>
<td>Guinea</td>
<td>Urban</td>
<td>Stabilised</td>
<td>Implementing car and motorbike scheme to reduce delays in seeking care for OB emergencies</td>
<td>Controlled Before-After</td>
<td>Adults</td>
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<td>Successful psychosocial intervention</td>
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<td>Bass, C.C.</td>
<td>2007</td>
<td>DRC</td>
<td>Rural</td>
<td>Stabilised</td>
<td>Implementing car and motorbike scheme to reduce delays in seeking care for OB emergencies</td>
<td>Controlled Before-After</td>
<td>Adults</td>
<td></td>
<td>Successful psychosocial intervention</td>
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<td>Shaik, M.A.</td>
<td>2009</td>
<td>Nigeria</td>
<td>General</td>
<td>Stabilised</td>
<td>Improving knowledge of danger signs, enhancing knowledge of preventive care</td>
<td>Controlled Before-After</td>
<td>Adults</td>
<td></td>
<td>Successful psychosocial intervention</td>
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<td>Shaik, M. A.</td>
<td>2008</td>
<td>Nepal</td>
<td>General</td>
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<td>Improving knowledge of danger signs, enhancing knowledge of preventive care</td>
<td>Controlled Before-After</td>
<td>Adults</td>
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<td>Successful psychosocial intervention</td>
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<td>Shaik, M.A.</td>
<td>2009</td>
<td>Pakistan</td>
<td>General</td>
<td>Stabilised</td>
<td>Improving knowledge of danger signs, enhancing knowledge of preventive care</td>
<td>Controlled Before-After</td>
<td>Adults</td>
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<td>Successful psychosocial intervention</td>
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<td>Shaik, M. A.</td>
<td>2010</td>
<td>Nepal</td>
<td>General</td>
<td>Stabilised</td>
<td>Improving knowledge of danger signs, enhancing knowledge of preventive care</td>
<td>Controlled Before-After</td>
<td>Adults</td>
<td></td>
<td>Successful psychosocial intervention</td>
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<td>Shaik, M.A.</td>
<td>2011</td>
<td>Nepal</td>
<td>General</td>
<td>Stabilised</td>
<td>Improving knowledge of danger signs, enhancing knowledge of preventive care</td>
<td>Controlled Before-After</td>
<td>Adults</td>
<td></td>
<td>Successful psychosocial intervention</td>
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<td>Shaik, M.A.</td>
<td>2012</td>
<td>Nepal</td>
<td>General</td>
<td>Stabilised</td>
<td>Improving knowledge of danger signs, enhancing knowledge of preventive care</td>
<td>Controlled Before-After</td>
<td>Adults</td>
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<td>Successful psychosocial intervention</td>
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<tr>
<td>Shaik, M.A.</td>
<td>2013</td>
<td>Nepal</td>
<td>General</td>
<td>Stabilised</td>
<td>Improving knowledge of danger signs, enhancing knowledge of preventive care</td>
<td>Controlled Before-After</td>
<td>Adults</td>
<td></td>
<td>Successful psychosocial intervention</td>
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ANNEX 8:
DETAILS FOR SYSTEMATIC REVIEW ON MENTAL HEALTH AND PSYCHOSOCIAL SUPPORT

Sources:
Published literature: Embase, Global Health, Medline, PsychInfo, PsychExtra
Grey literature: R4D, ReliefWeb, MSF Field Research, WHO, HealthNet-TPO, Global \\
Regional Psychosocial Support Initiative.

Health topic specific search terms:
psychosocial or mental or psychos* or mental disorders or psychiatr* or psychology or depress* or PTSD or 
post?traumatic stress disorder or neurotic or neuros* or anxiety or anxious or schizophrenic or schizothym* or 
mania or manic or delusion or OCD or phobia or phobic or somatic or somatoform or suicid* or dementia or 
alzheimer or epilepsy or alcohol or liquor or substance use or substance misuse or substance abuse or substance 
related disorders or psychotic or mood or affective or obsessive compulsive or panic or child behaviour or common 
mental disorder* or mental trauma or stress.
<table>
<thead>
<tr>
<th>Study authors, year</th>
<th>Study country</th>
<th>Setting</th>
<th>Population type</th>
<th>Humanitarian crisis type</th>
<th>Health outcome(s)</th>
<th>Intervention type (1)</th>
<th>Intervention type (2)</th>
<th>Intervention type (3)</th>
<th>Age group</th>
<th>Evidence category</th>
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<td>Ager A et al, 2001</td>
<td>Uganda</td>
<td>Camp</td>
<td>IDPs</td>
<td>Armed conflict</td>
<td>Resilience</td>
<td>Play therapy</td>
<td>Recreational</td>
<td>School children</td>
<td>A</td>
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<tr>
<td>Ayoughi S, 2009</td>
<td>Afghanistan</td>
<td>Urban</td>
<td>General</td>
<td>Armed conflict</td>
<td>Depression, anxiety</td>
<td>Counselling</td>
<td></td>
<td>adults</td>
<td>A</td>
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<tr>
<td>Basoglu M et al, 2005</td>
<td>Turkey</td>
<td>Urban &amp; rural</td>
<td>General</td>
<td>Natural disaster</td>
<td>PTSD</td>
<td>Behaviour therapy</td>
<td></td>
<td>adults</td>
<td>A</td>
<td></td>
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<tr>
<td>Basoglu M et al, 2003</td>
<td>Turkey</td>
<td>Urban &amp; rural</td>
<td>General</td>
<td>Natural disaster</td>
<td>PTSD, depression</td>
<td>CBT</td>
<td></td>
<td>adults</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Bass et al, 2013</td>
<td>DRC</td>
<td>Rural</td>
<td>General</td>
<td>Armed conflict</td>
<td>PTSD, depression/ anxiety, functioning</td>
<td>CPT</td>
<td></td>
<td>adults</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Bass J et al, 2012</td>
<td>Indonesia</td>
<td>Rural</td>
<td>General</td>
<td>Armed conflict</td>
<td>General mental health, functioning</td>
<td>Counselling</td>
<td></td>
<td>adults</td>
<td>A</td>
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<tr>
<td>Bastin P et al, 2013</td>
<td>Lebanon</td>
<td>Camp</td>
<td>Refugees</td>
<td>Armed conflict</td>
<td>General mental health, functioning</td>
<td>Various (unspecified)</td>
<td></td>
<td>adults</td>
<td>B</td>
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<tr>
<td>Becker et al, 2009</td>
<td>India</td>
<td>Rural</td>
<td>General</td>
<td>Natural disaster</td>
<td>Distress, functioning</td>
<td>Mixed psychosocial</td>
<td></td>
<td>adults</td>
<td>A</td>
<td></td>
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<tr>
<td>Berger R et al, 2009</td>
<td>Sri Lanka</td>
<td>Rural</td>
<td>General</td>
<td>Natural disaster</td>
<td>PTSD, depression, somatic, functioning problems</td>
<td>School-based psychosocial</td>
<td></td>
<td>School children</td>
<td>A</td>
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<tr>
<td>Betancourt TS et al, 2012</td>
<td>Uganda</td>
<td>Camp</td>
<td>IDPs</td>
<td>Armed conflict</td>
<td>Depression</td>
<td>Psychotherapy</td>
<td>Play therapy</td>
<td>Recreational, adolescents</td>
<td>A</td>
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<td>Bolton Pet al, 2007</td>
<td>Uganda</td>
<td>Camp</td>
<td>IDPs</td>
<td>Armed conflict</td>
<td>Depression, anxiety</td>
<td>Psychotherapy</td>
<td>Activity-based</td>
<td>adults</td>
<td>A</td>
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<td>Budosan Bet al, 2009</td>
<td>Sri Lanka</td>
<td>Rural</td>
<td>General</td>
<td>Natural disaster</td>
<td>Training</td>
<td>Training</td>
<td></td>
<td>adults</td>
<td>A</td>
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<tr>
<td>Catani C, 2009</td>
<td>Sri Lanka</td>
<td>Rural</td>
<td>IDPs</td>
<td>Natural disaster</td>
<td>PTSD</td>
<td>Narrative exposure therapy</td>
<td>Mind-body techniques</td>
<td>School children</td>
<td>A</td>
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<tr>
<td>Constandnides et al 2011</td>
<td>Palestine</td>
<td>Urban &amp; rural</td>
<td>General</td>
<td>Armed conflict</td>
<td>Psychosocial</td>
<td>Mixed psychosocial</td>
<td></td>
<td>adolescents</td>
<td>B</td>
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<tr>
<td>Descilo T et al, 2010</td>
<td>India</td>
<td>Urban &amp; rural</td>
<td>General</td>
<td>Natural disaster</td>
<td>PTSD, depression</td>
<td>Yoga</td>
<td></td>
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ANNEX 9:
DETAILS FOR SYSTEMATIC REVIEW ON NON-COMMUNICABLE DISEASE

Sources:
Published literature: Embase, Global Health, Medline, PsychInfo, IBSS.
Grey literature: ReliefWeb, Eldis, ALNAP, NCD Alliance, MSF Field Research,
World Diabetes Foundation, UN High Commission for Refugees (UNHCR), WHOLIS
NY Academy of Medicine Grey Literature, CRED, International Society of Nephrology.

Health topic specific search terms:
Non$communicable disease$ or NCD$ or chronic disease$ or chronic condition$ or long term condition$ or autoimmune disease$ or Lupus or heart disease or cardiovascular or cerebrovascular or stroke or hypertens$ or Cholesterol$ or heart failure or arrhythmia$ or aneurysm$ or cardiac or angina or myocardial infarction or coronary heart disease or CHD or ischaemia$ or cholesterol or blood pressure or blood sugar or blood glucose or diabetes or obesity or circulatory disorder$ or $carditis or cardiomyopathy or anaemia$ or cancer$ or neoplasm$ or asthma$ or respiratory or COPD or chronic obstructive pulmonary disease$ or pulmonary or bronchitis or lung function or lung disease$ or liver function or diabetes or chronic kidney disease$ or CKD or liver disease$ or renal failure or cirrho$ or osteoporosis or fibromyalgia or musculoskeletal or chronic pain or $arthritis or cystic fibrosis or thyroid disorder or neurological condition or Parkinson$ or colitis or multiple sclerosis or MS or Alzheimer$
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<td>Early recovery</td>
<td>NCDs</td>
<td>New diagnoses, uptake of services</td>
<td>Cross-sectional</td>
<td>Older people</td>
<td>C</td>
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<tr>
<td>Cel-Reshaid(1993)</td>
<td>Kuwait</td>
<td>Urban</td>
<td>Refugee &amp; entrapped</td>
<td>Armed conflict</td>
<td>Acute</td>
<td>Renal</td>
<td>Mortality, complications</td>
<td>Cohort</td>
<td>All</td>
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</tr>
<tr>
<td>Kantarcioğlu(2001)</td>
<td>Turkey</td>
<td>Urban</td>
<td>General</td>
<td>Natural disaster</td>
<td>Early recovery</td>
<td>Renal</td>
<td>Hypertension</td>
<td>Cross-sectional</td>
<td>All</td>
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<td>Khader(2012)</td>
<td>Jordan</td>
<td>Urban</td>
<td>Refugee</td>
<td>Armed conflict</td>
<td>Stabilised</td>
<td>Renal</td>
<td>Diabetes</td>
<td>Cross-sectional</td>
<td>Adults</td>
<td>A</td>
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<td>Metelko(1992)</td>
<td>Croatia</td>
<td>Urban</td>
<td>IDP &amp; general</td>
<td>Armed conflict</td>
<td>Acute</td>
<td>Renal</td>
<td>Diabetes and CVD</td>
<td>Case control</td>
<td>Adults, older people</td>
<td>C</td>
</tr>
<tr>
<td>Nadjafi(1997)</td>
<td>Iran</td>
<td>Urban &amp; rural</td>
<td>General</td>
<td>Natural disaster</td>
<td>Acute</td>
<td>Renal</td>
<td>Fasciotomy, ARF mortality</td>
<td>Case control</td>
<td>All</td>
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<td>Ozturk(2009)</td>
<td>Turkey</td>
<td>Urban</td>
<td>General</td>
<td>Natural disaster</td>
<td>Early recovery</td>
<td>Renal</td>
<td>Clinical measures, complications, mortality</td>
<td>Standard randomised trial</td>
<td>All</td>
<td>A</td>
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<td>Safari(2011)</td>
<td>Iran</td>
<td>Urban</td>
<td>General</td>
<td>Natural disaster</td>
<td>Acute</td>
<td>Renal</td>
<td>Complications, dialysis sessions, mortality</td>
<td>Cohort</td>
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<td>Sagheb(2008)</td>
<td>Iran</td>
<td>Urban</td>
<td>General</td>
<td>Natural disaster</td>
<td>Acute</td>
<td>Renal</td>
<td>Standard randomised fluid therapy</td>
<td>Case control</td>
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<td>Study</td>
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<td>Setting</td>
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<td>Phase</td>
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<td>Area of Focus</td>
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<td>Data Source</td>
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<td>Sengul(2004)</td>
<td>Turkey</td>
<td>Urban &amp; IDP &amp; General</td>
<td>Natural disaster</td>
<td>Acute</td>
<td>Diabetes</td>
<td>Clinical measures, QOL</td>
<td>Impact of earthquake on disease management</td>
<td>Cohort</td>
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<td>Sever(2004)</td>
<td>Turkey</td>
<td>Urban &amp; rural</td>
<td>General</td>
<td>Natural disaster</td>
<td>Early recovery</td>
<td>Renal</td>
<td>Weight loss, BP</td>
<td>Restricted access to haemodialysis</td>
<td>Cohort</td>
<td>All</td>
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<td>Sever(2004)</td>
<td>Turkey</td>
<td>Urban &amp; rural</td>
<td>General</td>
<td>Natural disaster</td>
<td>Early recovery</td>
<td>Renal</td>
<td>Survival probability</td>
<td>Antibiotics, transfusions, ventilation</td>
<td>Cross-sectional</td>
<td>All</td>
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<td>Sever(2002)</td>
<td>Turkey</td>
<td>Urban &amp; rural</td>
<td>General</td>
<td>Natural disaster</td>
<td>Acute</td>
<td>Renal</td>
<td>Mortality, duration of treatment</td>
<td>RRT</td>
<td>Cross-sectional</td>
<td>All</td>
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<td>Slim(1993)</td>
<td>Lebanon</td>
<td>Urban</td>
<td>General</td>
<td>Armed conflict</td>
<td>CVD</td>
<td>Cardiovascular surgery</td>
<td>Cross-sectional</td>
<td>All</td>
<td>C</td>
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<td>Somer(2010)</td>
<td>Israel</td>
<td>Urban &amp; rural</td>
<td>General</td>
<td>Armed conflict</td>
<td>Early recovery</td>
<td>MS</td>
<td>Relapse</td>
<td>Direct coping and planning</td>
<td>Cross-sectional</td>
<td>All</td>
</tr>
<tr>
<td>Vanholder(2011)</td>
<td>Haiti, Chile</td>
<td>Urban &amp; refugee &amp; general</td>
<td>Natural disaster</td>
<td>Acute</td>
<td>Renal</td>
<td>Dialysis, screening, fluid administration</td>
<td>Cross-sectional</td>
<td>All</td>
<td>C</td>
<td></td>
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<td>Vanholder(2001)</td>
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<td>Urban &amp; rural</td>
<td>General</td>
<td>Natural disaster</td>
<td>Renal</td>
<td>Dialysis</td>
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<td>All</td>
<td>C</td>
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<td>Yurugen(2001)</td>
<td>Turkey</td>
<td>Urban &amp; rural</td>
<td>General</td>
<td>Natural disaster</td>
<td>Acute</td>
<td>Renal</td>
<td>Hypotension, thrombosis, complications of vascular access, mortality</td>
<td>Dialysis</td>
<td>Cross-sectional</td>
<td>All</td>
</tr>
</tbody>
</table>

Note: Empty cells are for C grade papers (low evidences category) as these were not evaluated in detail.
ANNEX 10:
DETAILS FOR SYSTEMATIC REVIEW ON INJURY AND PHYSICAL REHABILITATION

Sources:
Published: Embase, Global Health, Medline, PsychInfo, IBSS.
Grey: SourceInfo, LCD, IDDC, Eldis, EDF, CBM, CIRRIE, R4D, MSF (France and Belgium), ALNAP, WHOLIS, CRED, International Society of Physical and Rehabilitation Medicine

Health topic specific search terms:
Rehabilit* or physiotherapy* or prosthes* or orthes* or prosthetic* or orthotic* or crutch* or wheelchair* or orthopaedic* or disabled or physical* impair* or deficienc* or disabilit* or handicap* or cerebral pals* or spina bifida cystica or spina bifida occulta or muscular dystroph* or musculoskeletal abnormalit* or brain injur* or amputat* or clubfoot or poliomyelitis or paraplegia or hemiplegia or hearing loss or deaf* or blind* or vis* loss or intellectual disabilit* or learning disabilit* or developmental disabilit* or child development* disorder* or Communication disorder*

Stage 1: Peer reviewed literature: electronic database search (N=4851)
Stage 2a: Peer reviewed literature: title/abstract review (N=4649)
Stage 2b: Peer reviewed literature (N=115)
Stage 3: Grey literature (N=2)
Stage 4: Peer reviewed and grey literature (N=117)

4534 excluded (non topic)

Stage 2a: Peer reviewed literature: title/abstract review (N=4649)
202 excluded (duplicates)
<p>| Study author | Year | Study country | Setting          | Humanitarian crisis type | Crisis stage | Health outcome(s)                                                                                                                                                                                                 | Type(s) of health intervention                                                                                                                                                                                                 | Study design | Evidence category |
|--------------|------|---------------|------------------|--------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------|
| Ahlberg      | 1994 | Saudi Arabia  | Urban            | Armed Conflict           | Orthopaedic injuries | Triage, open wound treatment with secondary suture, fracture stabilisation, antibiotics                                                                                                                  | Cross-Sectional                                                                 | C              |
| Ahsan-ul-Haq | 2010 | Pakistan      | Urban &amp; rural    | Armed Conflict           | Range of physical injuries | Triage, resuscitation and surgical procedures                                                                                                                | Cross-Sectional                                                                 | C              |
| Akhaghi      | 1997 | Iran          | Urban &amp; rural    | Armed Conflict           | Maxillofacial injury | Surgical procedures (cheiloplasty, saliva shields)                                                                                                           | Cross-Sectional                                                                 | C              |
| Almassi      | 2010 | Iran          | Urban &amp; rural    | Armed Conflict           | Skin lesions in lower limb amputees                                                                                                                        | Surgical, medical and rehabilitative care                                                                                                                      | Cross-Sectional | C                 |
| Ameen        | 1984 | Iraq          | Urban &amp; rural    | Armed Conflict           | Cerebrovascular injury | Immediate surgical intervention in hospital                                                                                                                     | Cross-Sectional                                                                 | C              |
| Amrilmashidi | 2003 | Iran          | Urban &amp; rural    | Armed Conflict           | Acute crisis | Low velocity penetrating head injuries                                                                                                                        | Minimal wound debridement (suture, referral)                                                                                                                  | Cohort         | B                 |
| Asim         | 2010 | Pakistan      | Urban &amp; rural    | Urban &amp; rural            | Limb injuries                                                                                                                                             | Surgery, examinations, plastic procedures                                                                                                                   | Cross-Sectional | C                 |
| Atef         | 1993 | Iran          | Urban &amp; rural    | Natural Disaster         | Range of physical injuries, acute renal failure                                                                                                           | Intensive medical management (hydration, regular review, haemodialysis)                                                                                       | Non-Random Trial | A                 |
| Athar        | 2011 | Pakistan      | Urban &amp; rural    | Natural Disaster         | Range of physical injuries                                                                                                                              | Pre-hospital medical care                                                                                                                                  | Cohort         | B                 |
| Awais        | 2012 | Pakistan      | Urban &amp; rural    | Natural Disaster         | Orthopaedic trauma &amp; amputation                                                                                                                            | Amputation &amp; orthopaedic surgery                                                                                                                                | Cross-Sectional | C                 |
| Bajec        | 1993 | Kuwait        | Urban &amp; rural    | Armed Conflict           | Explosive and penetrating injuries (soft tissue damage, fractures, multiple sites)                                                                       | Orthopaedic surgery                                                                                                                                      | Cross-Sectional | C                 |
| Bar-On       | 2011 | Haiti         | Urban &amp; rural    | Natural Disaster         | Range of musculoskeletal injuries                                                                                                                          | Orthopaedic treatment                                                                                                                                   | Cross-Sectional | C                 |
| Bazardzanovic| 1998 | Bosnia and Herzegovina | Rural | Armed Conflict           | Acute crisis | Craniovascular injuries                                                                                                                                     | Application of first aid and medical care (exploration of wounds, treatment antibiotic)                                                                  | Cross-Sectional | B                 |
| Bhatnagar    | 1989 | Pakistan      | Rural            | Armed Conflict           | Range of physical injuries                                                                                                                                | Early surgical management, evacuation                                                                                                                      | Cross-Sectional | C                 |
| Bowyer       | 1996 | Pakistan      | Urban &amp; rural    | Armed Conflict           | Small fragment wounds                                                                                                                                     | Conservative medical and surgical treatment                                                                                                                  | Cross-Sectional | B                 |
| Bozkurt      | 2007 | Pakistan      | Urban &amp; rural    | Armed Conflict           | Range of physical injuries                                                                                                                                | Acute medical and surgical care                                                                                                                             | Cross-Sectional | C                 |
| Brown        | 2009 | Iraq &amp; Afghanistan | Urban &amp; rural | Armed Conflict           | Ballistic lower limb open fractures                                                                                                                        | Amputation, Mangled Extremity Severity Score (MESS) guidelines                                                                                               | Cross-Sectional | C                 |
| Bumbasirevic | 2010 | Serbia        | Urban &amp; rural    | Armed Conflict           | Infected tibial nonunion after open fractures (refracture, infection, need for amputation)                                                                 | Radical bony and soft tissue resection and bone transport - Ilizarov technique                                                                                   | Cohort         | B                 |
| Chambers     | 2006 | Indonesia     | Urban &amp; rural    | Natural Disaster         | Range of physical injuries                                                                                                                                | Surgery                                                                                                                                                    | Cross-Sectional | C                 |
| Chen         | 2010 | China         | Urban &amp; rural    | Natural Disaster         | Orthopaedic limb trauma                                                                                                                                  | Amputation                                                                                                                                                | Cross-Sectional | C                 |
| Chen         | 2011 | China         | Urban &amp; rural    | Natural Disaster         | Acute crisis | Gas gangrene infection                                                                                                                                     | Surgical treatment, quarantine antibiotics                                                                                                                   | Cohort         | B                 |
| Cheng        | 2010 | China         | Urban            | Natural Disaster         | Acute crisis | Crush syndrome                                                                                                                                            | Continuous renal replacement therapy (CRRT)                                                                                                                  | Cross-Sectional | B                 |
| Coupland     | 1988 | Pakistan      | Urban &amp; rural    | Armed Conflict           | War-related physical injuries                                                                                                                             | Surgery, anaesthesia, transfusion, amputation                                                                                                               | Cross-Sectional | C                 |
| Coupland     | 1992 | Pakistan &amp; Thailand | Urban &amp; rural | Armed Conflict           | Acute crisis | Cerebrovascular injuries                                                                                                                                     | Surgery, anaesthesia, rehabilitation                                                                                                                        | Cross-Sectional | B                 |
| Covey        | 2000 | Croatia       | Rural            | Armed Conflict           | Acute crisis | Musculoskeletal injury                                                                                                                                    | Reconstructive surgery                                                                                                                                   | Cross-Sectional | C                 |
| Cutting      | 1992 | Lebanon       | Camp             | Armed Conflict           | Acute crisis | Range of physical injuries (recovery, further treatment, disability)                                                                                       | Surgery (with limited access to supplies)                                                                                                                     | Cross-Sectional | B                 |</p>
<table>
<thead>
<tr>
<th>Study</th>
<th>Year</th>
<th>Country/Region</th>
<th>Setting</th>
<th>Conflict</th>
<th>Phase</th>
<th>Injuries/Treatment</th>
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<tr>
<td>De Wind 1987</td>
<td>Uganda</td>
<td>Urban</td>
<td>Armed Conflict</td>
<td>Acute crisis</td>
<td>Missile injuries (healing, disability, union of fractures)</td>
<td>Surgical procedures in a resource limited setting</td>
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<tr>
<td>Dediae 1998</td>
<td>Bosnia &amp; Herzegovina</td>
<td>Urban &amp; rural</td>
<td>Armed Conflict</td>
<td>Acute crisis</td>
<td>Penetrating chest injuries (infection, mortality)</td>
<td>Thoracotomy, conservative treatment (thoracostomy and/or thoracocentesis)</td>
</tr>
<tr>
<td>Dediae 1999</td>
<td>Bosnia &amp; Herzegovina</td>
<td>Urban &amp; rural</td>
<td>Armed Conflict</td>
<td>Acute crisis</td>
<td>Heart and great vessel injuries (mortality, non-mortality)</td>
<td>Amputation and/or revascularisation procedures</td>
</tr>
<tr>
<td>Dhar 2008</td>
<td>India</td>
<td>Urban &amp; rural</td>
<td>Natural Disaster</td>
<td>Acute crisis</td>
<td>Lower limb fractures in polytrauma patients</td>
<td>Orthopaedic surgery (external fixator to Ilizarov method in osteosynthesis conversion)</td>
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<td>Dubravko 1994</td>
<td>Croatia</td>
<td>Urban &amp; rural</td>
<td>Armed Conflict</td>
<td>Acute crisis</td>
<td>Fracture of the extremities (complications, healing)</td>
<td>External fixation</td>
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<tr>
<td>Ebrahimzadeh 2007</td>
<td>Iran</td>
<td>Urban &amp; rural</td>
<td>Armed Conflict</td>
<td>Acute crisis</td>
<td>Lower extremity injuries (pain, employment, psychological problems)</td>
<td>Vascular surgery (revision varicose vein, fasciotomy, amputation)</td>
</tr>
<tr>
<td>Fakri 2012</td>
<td>Jordan</td>
<td>Urban &amp; rural</td>
<td>Armed Conflict</td>
<td>Acute crisis</td>
<td>Infected and non-infected tibial non-union (recurrence of infection, readmission, non-union, mortality)</td>
<td>Amputation and/or reconstruction</td>
</tr>
<tr>
<td>Fasol 1989</td>
<td>Thailand</td>
<td>Urban &amp; rural</td>
<td>Armed Conflict</td>
<td>Acute crisis</td>
<td>Lower extremity injuries (pain, employment, psychological problems)</td>
<td>Emergency surgical treatment with limited facilities</td>
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<tr>
<td>Gosselin 2011</td>
<td>Haiti &amp; Dominican Republic</td>
<td>Urban &amp; rural</td>
<td>Natural Disaster</td>
<td>Acute crisis</td>
<td>Orthopaedic trauma (DALYs averted)</td>
<td>Orthopaedic surgery (fracture braces, reduction &amp; fixation, external fixators, fasciotomy, amputation, debridement)</td>
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<td>Gousheh 1995</td>
<td>Iran</td>
<td>Urban &amp; rural</td>
<td>Armed Conflict</td>
<td>Acute crisis</td>
<td>Brachial plexus injuries</td>
<td>Surgical management (nerve grafts etc)</td>
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<td>Gu 2010</td>
<td>China</td>
<td>Urban &amp; rural</td>
<td>Natural Disaster</td>
<td>Acute crisis</td>
<td>Traumatic brain injury</td>
<td>First aid and emergency surgery</td>
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<td>Guner 2013</td>
<td>Turkey</td>
<td>Urban &amp; rural</td>
<td>Natural Disaster</td>
<td>Acute crisis</td>
<td>Musculoskeletal trauma</td>
<td>Minimal invasion method with Kocher's wires, surgical and rehabilitation care</td>
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<td>Hadzismajlovic 2007</td>
<td>Bosnia &amp; Herzegovina</td>
<td>Urban &amp; rural</td>
<td>Armed Conflict</td>
<td>Acute crisis</td>
<td>Isolated penetrating chest injury</td>
<td>Traumatic Thromboembolic Disease (TEP)</td>
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<td>Has 2001</td>
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<td>Urban &amp; rural</td>
<td>Armed Conflict</td>
<td>Acute crisis</td>
<td>Open fractures of the hands and feet</td>
<td>Minimal incision method with Kocher’s wires, surgical and rehabilitation care</td>
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<tr>
<td>Herald 2012</td>
<td>Haiti</td>
<td>Urban</td>
<td>Natural Disaster</td>
<td>Acute crisis</td>
<td>Range of physical injuries</td>
<td>Medical, surgical and rehabilitation care</td>
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<td>Hudolin 2003</td>
<td>Bosnia &amp; Herzegovina</td>
<td>Urban &amp; rural</td>
<td>Armed Conflict</td>
<td>Acute crisis</td>
<td>Penetrating colorectal injury (complications, mortality)</td>
<td>Surgical management (resection, resection with defunctioning ileostomy)</td>
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<td>Hudolin 2005</td>
<td>Bosnia &amp; Herzegovina</td>
<td>Urban &amp; rural</td>
<td>Armed Conflict</td>
<td>Acute crisis</td>
<td>Penetrating colorectal injury (complications, mortality)</td>
<td>Surgical management (resection, resection with defunctioning ileostomy)</td>
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<td>Hussain 2001</td>
<td>Pakistan</td>
<td>Urban &amp; rural</td>
<td>Armed Conflict</td>
<td>Acute crisis</td>
<td>Musculoskeletal trauma</td>
<td>Minimal incision method with Kocher’s wires, surgical and rehabilitation care</td>
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<td>Author</td>
<td>Year</td>
<td>Country</td>
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<td>Conflict</td>
<td>Phase of Care</td>
<td>Description</td>
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<td>Jevtic</td>
<td>1996</td>
<td>Bosnia &amp; Herzegovina</td>
<td>Urban &amp; rural</td>
<td>Armed Conflict</td>
<td>Acute crisis</td>
<td>Range of physical injuries, Medical, surgical, and rehabilitation care</td>
</tr>
<tr>
<td>Jiang</td>
<td>2012</td>
<td>China</td>
<td>Urban &amp; rural</td>
<td>Natural Disaster</td>
<td>Acute crisis</td>
<td>Range of physical injuries, Emergency operations under anaesthesia (general and regional)</td>
</tr>
<tr>
<td>Jiang</td>
<td>2010</td>
<td>China</td>
<td>Rural</td>
<td>Natural Disaster</td>
<td>Acute crisis</td>
<td>Range of physical injuries, Rehabilitation</td>
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<td>Karamouzian</td>
<td>2010</td>
<td>Iran</td>
<td>Urban</td>
<td>Natural Disaster</td>
<td>Acute crisis</td>
<td>Spinal cord injury, Rehabilitation</td>
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<td>Kumoona</td>
<td>2011</td>
<td>Iraq</td>
<td>Urban</td>
<td>Armed Conflict</td>
<td>Acute crisis</td>
<td>Facial injuries, Craniofacial surgery (bone graft reconstruction)</td>
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<td>Latouz</td>
<td>2003</td>
<td>Sierra Leone</td>
<td>Urban</td>
<td>Armed Conflict</td>
<td>Stabilisation</td>
<td>Neuropathic pain, Pharmaceutical treatment</td>
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<td>Leininger</td>
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<td>Iraq</td>
<td>Urban</td>
<td>Armed Conflict</td>
<td>Acute crisis</td>
<td>Range of physical injuries, Surgery, vacuum-assisted surgical dressings</td>
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<td>Li</td>
<td>2012</td>
<td>China</td>
<td>Rural</td>
<td>Natural Disaster</td>
<td>Acute crisis</td>
<td>Spinal injuries, Institutional rehabilitative programme</td>
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<td>Li</td>
<td>2009</td>
<td>China</td>
<td>Urban &amp; rural</td>
<td>Natural Disaster</td>
<td>Crush injuries</td>
<td>Intensive care unit (haemodialysis, prompt medical treatment)</td>
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<td>Li</td>
<td>2009</td>
<td>China</td>
<td>Urban &amp; rural</td>
<td>Natural Disaster</td>
<td>Range of physical injuries, Rehabilitation</td>
<td>Cross-Sectional A</td>
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<tr>
<td>Li</td>
<td>2011</td>
<td>China</td>
<td>Urban &amp; rural</td>
<td>Natural Disaster</td>
<td>Crush injuries, Renal replacement therapy and blood transfusion</td>
<td>Cross-Sectional A</td>
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<tr>
<td>Liu</td>
<td>2010</td>
<td>China</td>
<td>Urban</td>
<td>Natural Disaster</td>
<td>Lower leg fractures, Orthopaedic surgery</td>
<td>Cross-Sectional B</td>
</tr>
<tr>
<td>Liu</td>
<td>2012</td>
<td>China</td>
<td>Urban &amp; rural</td>
<td>Natural Disaster</td>
<td>Tibial and fibular fractures, External fixation and vacuum sealing</td>
<td>Cohort B</td>
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<td>Lovric</td>
<td>1994</td>
<td>Croatia</td>
<td>Urban &amp; rural</td>
<td>Armed Conflict</td>
<td>Acute crisis</td>
<td>Injury of major blood vessels of the extremities, Emergency surgical treatment (fasciotomy, antibiotics)</td>
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<td>Mallick</td>
<td>2005</td>
<td>Pakistan</td>
<td>Urban &amp; rural</td>
<td>Natural Disaster</td>
<td>Early recovery</td>
<td>Major disabilities, Rehabilitation (post-spinal fixation / amputation)</td>
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<td>Natural Disaster</td>
<td>Range of physical injuries, Triage</td>
<td>Cross-Sectional C</td>
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<td>Former Yugoslavia</td>
<td>Urban &amp; rural</td>
<td>Armed Conflict</td>
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<td>Urban &amp; rural</td>
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<td>Urban &amp; rural</td>
<td>Armed Conflict</td>
<td>Injuries of the foot, Orthopaedic surgery, plaster cast, external fixation</td>
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<td>Cross-Sectional</td>
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<td>Croatia</td>
<td>Armed Conflict</td>
<td>Cross-Sectional</td>
<td>Acute renal failure, surgical management (laparotomy, cystostomy, ureterolysis)</td>
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<td>Armed Conflict</td>
<td>Cross-Sectional</td>
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<td>Cross-Sectional</td>
<td>Acute renal failure, surgical management (laparotomy, cystostomy, ureterolysis)</td>
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*Note: The above table lists studies that have investigated the spectrum of injuries and treatments in various conflict and disaster scenarios.*
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<th>Year</th>
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<th>Country</th>
<th>Region</th>
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<th>Injury Type</th>
<th>Treatment/Intervention</th>
<th>Study Design</th>
<th>Notes</th>
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<td>Urban</td>
<td>Armed Conflict</td>
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<td>Thoracic surgery</td>
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<td>Lebanon</td>
<td>Urban</td>
<td>Armed Conflict</td>
<td>Cardiac injury</td>
<td>Emergency surgical treatment</td>
<td>Cross-Sectional C</td>
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<td>Zangana</td>
<td>Iraq</td>
<td>Urban &amp; rural</td>
<td>Armed Conflict</td>
<td>Acute crisis</td>
<td>Penetrating liver injury</td>
<td>Emergency liver surgery</td>
<td>Cross-Sectional B</td>
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<tr>
<td>2011</td>
<td>Zhang</td>
<td>China</td>
<td>Urban &amp; rural</td>
<td>Natural Disaster</td>
<td>Stabilisation</td>
<td>Bone fracture</td>
<td>Rehabilitation service programme (NGO-Health Sector-Volunteer)</td>
<td>Non-Random Trial A</td>
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<td>China</td>
<td>Urban &amp; rural</td>
<td>Natural Disaster</td>
<td>Early recovery</td>
<td>Physical disability</td>
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<td>Non-Random Trial A</td>
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<td>Multiple physical injuries</td>
<td>Medical &amp; surgical intervention</td>
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ANNEX 11:
DETAILS FOR SYSTEMATIC REVIEW ON HEALTH SERVICE DELIVERY

Sources:
Medline, Embase, Global Health

Health topic specific search terms:
Rehabilit* or physiotherapy* or prosthesis* or orthes* or prosthetic* or orthotic* or crutch* or wheelchair* or (Quality improvement OR quality management system* OR total quality management OR continuous quality improvement OR quality assurance OR health care OR quality of health care OR quality collaborative OR quality indicator comparison* OR benchmark* OR balanced scorecard OR quality strategy OR patient safety OR patient risk management OR community based service* OR community driven service* OR community mobile$ation OR community based organisation* OR non$governmental organisation* OR peer support OR community scorecard* OR service agreement* OR public$private partnership* OR stewardship OR ambulatory care OR CBO OR community health practitioners OR community health service* OR community health OR volunteer* OR community health worker* OR district health system OR district hospital OR doctor* OR faith-based organisation* OR FBO OR health care organisation* OR health centre OR health facility OR mobile health OR health personnel OR health post* OR health service organisation* OR health service* OR health service delivery OR health delivery OR health worker* OR clinic* OR hospital OR managed care OR nurse practitioner* OR paramedical OR pharmaceutical service* OR pharmacy OR physician* OR primary health care OR primary health centre* OR primary care OR voluntary organisation* OR health provider* OR registered nurse* OR traditional health worker* OR alternative health delivery OR case management map OR certificate of need OR client provider interaction OR patient provider interaction Or patient satisfaction OR client satisfaction OR clinical decision support system OR clinical guidelines OR clinical pathways OR clinical peer review OR clinical practice OR communication OR community capacity for care OR community driven service* OR health education OR health improvement OR community partnership OR secondary care OR secondary health care OR tertiary care OR tertiary health care OR access* OR health care coverage OR equity OR essential kit* OR health care provision OR standard treatment guideline* OR standardised medical technology list* OR standardised pharmaceutical list* OR continuity of care OR coordination of care OR diagnosis* OR patient experience OR treatment OR therapy OR health care intervention OR prevention OR assessment).mp

Stage 1: Peer reviewed literature: electronic database search (N=28199)

Stage 2a: Peer reviewed literature: title/abstract review (N=2534)

Stage 2b: Peer reviewed literature (N=88)

Stage 3: Analysis (N=32)
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<th>Health topic</th>
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<th>Intervention</th>
<th>Health service level of intervention</th>
<th>Study design</th>
<th>Evidence category</th>
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<td>Urban &amp; rural</td>
<td>General</td>
<td>Natural disaster</td>
<td>Early recovery</td>
<td>All</td>
<td>assessments, hospitalisations, operations</td>
<td>Israeli Defence Force Field Hospital</td>
<td>secondary</td>
<td>cross-sectional</td>
<td>C</td>
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<td>Chane(2010)</td>
<td>Pakistan</td>
<td>Rural</td>
<td>General</td>
<td>Natural disaster</td>
<td>Early recovery</td>
<td>All</td>
<td>equity of use</td>
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<td>Chapin(2009)</td>
<td>Peru</td>
<td>Urban &amp; rural</td>
<td>General</td>
<td>Natural disaster</td>
<td>Early recovery</td>
<td>Tuberculosis, HIV, Family Planning</td>
<td>patients seen before and after earthquake</td>
<td>primary, secondary and tertiary in 4 districts</td>
<td>primary, secondary, tertiary</td>
<td>cross-sectional</td>
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<td>General</td>
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<td>infection, orthopaedic casualties, mortality, cross-infection, amputation, depression score</td>
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<td>casualty management</td>
<td>patient transfers</td>
<td>Patient transfer protocol</td>
<td>Ambulatory - all</td>
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<td>Cutting(1992)</td>
<td>Lebanon camp</td>
<td>Refugee</td>
<td>Armed conflict</td>
<td>Acute</td>
<td>operations performed</td>
<td></td>
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<td>Refugee Camp, Hospital</td>
<td>secondary</td>
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<td>Etting(2000)</td>
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<td>Urban &amp; refugee</td>
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<td>Armed conflict</td>
<td>Acute</td>
<td>All</td>
<td>Trends in volume of visits to health centres, mortality, vaccination uptake</td>
<td>Medical crisis headquarters formed, new locations for health units, back up facilities in inpatient units, war reserves of drugs, training courses for GPs and first aid courses for civilian defence</td>
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<td>Fernald(2007)</td>
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<td>Rural</td>
<td>General</td>
<td>Natural disaster</td>
<td>Early recovery</td>
<td>All</td>
<td>patient encounters, prescriptions, inpatient capability</td>
<td>Mobile Army Surgical Hospital - with primary care department</td>
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<td>Fosse(1992)</td>
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<td>Armed conflict</td>
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<td>casualty management</td>
<td>operations, complications</td>
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<td>Giangreco(2012)</td>
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<td>Quality measure</td>
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<td>Halpern(2003)</td>
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<td>casualty management</td>
<td>treatment and operations</td>
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<td>Schreeb (2008)</td>
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*Note: The table above provides a summary of the medical services and research methodologies used in various disaster scenarios.*
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<th>Setting</th>
<th>Design</th>
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<td>General</td>
<td>Natural disaster</td>
<td>Acute casualty management</td>
<td>patients, length of stay</td>
<td>USNS Comfort</td>
<td>Primary and secondary</td>
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<td>Wickramasinghe(2007)</td>
<td>Sri Lanka</td>
<td>camp</td>
<td>IDP</td>
<td>Natural disaster</td>
<td>Acute, Early recovery</td>
<td>All</td>
<td>Patient satisfaction</td>
<td>Health care services in relief camps</td>
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<td>Bosnia and Herzegovina</td>
<td>Urban &amp; rural</td>
<td>General &amp; refugee</td>
<td>Armed conflict</td>
<td>Acute</td>
<td>All</td>
<td>Number of examinations each year, number of operations</td>
<td>Establishment of war hospital in advance of war, prior training of local professionals, medical technicians in armoured vehicles, triage</td>
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ANNEX 12:
DETAILS FOR SYSTEMATIC REVIEW ON HEALTH SYSTEMS

Sources:

Health topic specific search terms:
Health system* or Health system design or Healthcare polic* or Healthcare strateg* or National guideline* or National standard* or Health service delivery or Human resources or Health workforce or Medical staffing or Drug suppl* or Medical suppl* or Medical equipment or Supply chain or Health financing or User fees or Healthcare costs or Health information management or Health information system or Health management information system* or HMIS or Health surveillance system* or Medical data security or Leadership or Governance or Leadership in healthcare or Leadership in medical assistance or Leadership in medical operation* or Lead health agency or Ministry of health or MOH or Government* or Support of local system or Support of national system or Health system strengthening or Sustainability or System collapse or System failure.

Stage 1: Peer reviewed literature: electronic database search (N=17259)

Stage 2a: Peer reviewed literature: title/abstract review (N=16997)

Stage 2b: Peer reviewed literature (N=194)

Stage 3: Analysis (N=56)
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<td>L&amp;G</td>
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<td>Alonso, A. and R. Brugha</td>
<td>2006</td>
<td>East Timor</td>
<td>General population</td>
<td>Conflict</td>
<td>Early recovery</td>
<td>Case study</td>
<td>General health system, L&amp;G</td>
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<td>Barnabas, G. A. B. and A. Zwi</td>
<td>1997</td>
<td>Ethiopia</td>
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<td>Case study</td>
<td>General health system, L&amp;G</td>
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<td>Batley, N. J. et al.</td>
<td>2008</td>
<td>Lebanon</td>
<td>Health workers</td>
<td>Conflict</td>
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<td>Cote d'Ivoire</td>
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<td>Bile, K. M. et al.</td>
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<td>Pakistan</td>
<td>IDP</td>
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ANNEX 13:
DETAILS FOR SYSTEMATIC REVIEW ON ACCESS TO HEALTH CARE

Sources:

Health topic specific search terms:
"Health Services Accessibility"/ OR "Architectural Accessibility"/ OR exp "health care costs"/ OR "health expenditures"/ OR "healthcare disparities"/ OR (((access OR accessibility OR affordability OR cost OR costs) adj2 (health OR healthcare OR doctor$ OR patient$ OR beneficiaries OR hospital$ OR clinic$ OR medication$ OR drug$ OR surgery OR treatment)) OR ((discrimination OR disparit$) adj2 (health OR healthcare))).tw
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<th>Population type</th>
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<th>Type(s) of health interventions</th>
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<td>Informational; discrimination (gender) of access, end-users</td>
<td>Cross-sectional</td>
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<td>Urban &amp; rural</td>
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<td>Pregnant women; children</td>
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ANNEX 14: DETAILS FOR SYSTEMATIC REVIEW ON ACCOUNTABILITY TO END- USERS

Sources:
Embase, Global Health, International Bibliography of Social Sciences, Medline, PsychINFO, Web of Science

Health topic specific search terms:
exp "Social Responsibility"/ OR exp "Ethics, Medical"/ OR exp "Patient Rights" OR exp "culture"/ OR "quality of health care"/ OR exp "Guidelines as Topic"/ OR exp "Guideline"/ OR exp "patient safety"/ OR exp "Standard of Care"/ OR exp "Clinical Competence"/ OR exp "Guideline Adherence"/ OR exp "Quality Indicators, Health Care"/ OR (("end users" OR "end user" OR beneficiary OR patient) adj2 (accountability OR obligation OR duty OR right$)) OR "right to health" OR "right to healthcare" OR ((availability OR acceptability) adj2 (healthcare OR "health care")) OR (ethical OR ethics) adj2 (medical OR healthcare OR "health care") OR "informed consent" OR (patient$ adj2 (privacy OR confidentiality)) OR (cultur$ adj2 (sensitiv$ OR appropriat$ OR acceptab$)) OR (quality adj2 (healthcare OR "health care") OR medicine$ OR drug$ OR surgery OR procedure$ OR "health worker" OR "health workers" OR "healthcare workers" OR "health professional" OR "health professionals" OR "healthcare professional" OR "healthcare professionals" OR doctor$ OR nurse$ OR "medical staff" OR "medical training" OR "medical skills") OR ((professional OR gold OR national OR care OR practice OR medical) adj2 (standard$ OR guideline$ OR protocol$)) OR (patient adj2 safety) OR ("professional expectations" OR "standard of care" OR incompeten$ OR negligent$ OR irresponsible)).tw

Stage 1: Peer reviewed literature: electronic database search (N=4228)
Stage 2: Title/abstract review (N=3876)
Stage 3: Detailed review (N=48)
Stage 4: Data extraction of included studies (N=30)
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ANNEX 15:
DETAILS FOR SYSTEMATIC REVIEW ON HEALTH ASSESSMENT METHODS

Sources:
Embase, Global Health, International Bibliography of Social Sciences, Medline, PsychINFO, Web of Science

Health topic specific search terms:
("Rapid assessment" OR ((morbidity OR mortality OR population OR nutrition? OR fertility OR "birth rates" OR "birth rates") adj2 (estimat? OR assess?)) OR ((health OR weight OR height OR sanitation OR security OR shelter OR "health needs" OR "security needs" OR "shelter needs" OR water OR hygiene OR threat? OR protection? OR settlement? OR "food security") adj2 assess?)).tw

Stage 1: Peer reviewed literature: electronic database search (N=865)
Stage 2: Title/abstract review (N=663)
Stage 3: Detailed review (N=101)
Stage 4: Data extraction of included studies (N=83)
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ANNEX 16: DETAILS FOR SYSTEMATIC REVIEW ON COORDINATION

Sources:

Health topic specific search terms:
((humanitarian adj2 (coordination OR reformS)) OR ("cluster system" OR "cluster approach" OR "transformative agenda") OR (ocha adj2 (coordination OR mechanismS)) OR ("united nations" OR "uni" OR agency) adj1 partnershipS) OR ((competition OR rivalry) adj2 (agencies OR funding OR recognition OR data OR interagency)) OR ((leadership OR coordination) adj2 ("health care" OR healthcare OR "medical assistance" OR "medical operations")) OR ("lead health agency" OR "ministry of health" OR "primary health intervention" OR "subsidary health intervention" OR "primary health interventions" OR "subsidary health interventions") OR (support adj2 ("local health system" OR "national health system" OR "local health systems" OR "national health systems").

Stage 1: Peer reviewed literature: electronic database search (N=778)

Stage 2: Title/abstract review (N=662)

Stage 3: Detailed review (N=37)

Stage 4: Data extraction of included studies (N=25)

53 excluded (duplicates)

315 excluded (non-topic)

12 excluded (non-topic)
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<td>Conflict</td>
<td>Chronic</td>
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<td>IDP</td>
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<td>General</td>
<td>Conflict</td>
<td>Chronic</td>
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<td>General</td>
<td>Conflict</td>
<td>Chronic</td>
<td>NGO medical aid; use of existing services</td>
<td>Security coordination</td>
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<td>Urban &amp; rural</td>
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<td>General</td>
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<td>Acute</td>
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ANNEX 17: DETAILS FOR SYSTEMATIC REVIEW ON SECURITY OF HEALTHCARE WORKERS

Sources:

Health topic specific search terms:
(violence/ AND exp Health Personnel/) OR ((security OR safety OR attack? OR death? OR danger? OR threat? OR violence) adj4 (“healthcare worker” OR “healthcare workers” OR “health professional” OR “health professionals” OR “health care worker” OR “health care workers” OR “healthcare professional” OR “healthcare professionals” OR “health worker” OR “health workers” OR doctor? OR nurse? OR “medical operations” OR “aid worker” OR “aid workers”).tw

Stage 1: Peer reviewed literature: electronic database search (N=397)

Stage 2: Title/abstract review (N=344)

Stage 3: Detailed review (N=29)

Stage 4: Data extraction of included studies (N=16)

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315 excluded (non-topic)

13 excluded (non-topic)
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<th>Crisis stage</th>
<th>Humanitarian crisis type</th>
<th>Character of factor influence</th>
<th>Target age group</th>
<th>Evidence category</th>
<th>Health topic</th>
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<td>Refugees</td>
<td>Descriptive</td>
<td>Use of existing services</td>
<td>Chronic</td>
<td>Conflict</td>
<td>Assassination of doctors by patients and family</td>
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<td>Cross-sectional</td>
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<td>Chronic</td>
<td>Conflict</td>
<td>Use of existing services</td>
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<td>Refugees</td>
<td>Cross-sectional</td>
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<td>Conflict</td>
<td>Kidnapping, violence, assassination attempts</td>
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<td>Chronic</td>
<td>Conflict</td>
<td>Violence and humiliation of doctors by Taliban</td>
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<td>Chronic</td>
<td>Conflict</td>
<td>Security of doctors in changing nature of conflict</td>
<td>All</td>
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<td>Chronic</td>
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<td>Conflict</td>
<td>Security of doctors in changing nature of conflict</td>
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<td>Conflict</td>
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<td>Conflict</td>
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<td>Conflict</td>
<td>Measuring rate of violence and threats in public health field</td>
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<td>Conflict</td>
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Summary data extraction table:
ANNEX 18:
DETAILS FOR SYSTEMATIC REVIEW ON URBANISATION

Sources:

Topic specific search terms:

Stage 1: Peer reviewed literature: electronic database search (N=3529)
Stage 2: Title/abstract review (N=3141)
Stage 3: Detailed review (N=46)
Stage 4: Data extraction of included studies (N=27)

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3095 excluded (non-topic)
19 excluded (non-topic)
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<th>Evidence category</th>
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<th>Health topic</th>
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<td>Descriptive, comparative</td>
<td>All; Pregnant women</td>
<td>C</td>
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<td>C</td>
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Hurford (2010) Indonesia Urban General Natural (flooding) Chronic Disaster preparedness 1D vs 2D computer modelling to predict flood extent Descriptive, comparative All A Preventive care

Kirsch (2012) Pakistan Rural; Urban General Natural (flooding) Early recovery Care planning Urban environments more resilient in disaster recovery Descriptive, comparative All A Health access; nutrition; water, sanitation, hygiene

Liu (2011) China Urban General Natural (earthquake) Acute Disaster preparedness Urban health facilities and shelter must take account of seismic faults and threats Descriptive All B Health access

Liu (2010) China Rural; Urban General Natural (earthquake) Early recovery Care planning Girls, older age groups and those from rural areas suffer more PTSD than those from urban areas Cross-sectional, comparative Children 11 – 17 years A Mental health

Lucchi (2010) Brazil; Haiti; Guatemala Urban General Urban violence Chronic Care planning Health provision strategies outside traditional conflict setting Descriptive All B Health access

Lucchi (2012) Multiple Urban General Urban violence Chronic Care planning Health provision strategies outside traditional conflict setting Descriptive All A Health access

Mullen (2008) Burundi Rural; Urban General Conflict Chronic Use of existing services Lower socioeconomic status and greater distance from health facility reduces mental health and increases mortality in urban but not rural settings Cross-sectional All A Health access; mental health

Munslow (2010) Multiple (Asia) Urban General Natural Chronic Disaster preparedness Climate change threat to urban environments: flooding, drought Descriptive All B Health access

Najarian (2001) Armenia Urban General; IDP Natural (earthquake) Early recovery Care planning Urban relocation associated with more mental health problems than non-relocation Descriptive, comparative Women B Mental health

Ochoa (2007) Multiple Urban General Natural Chronic Disaster preparedness; coordination Extreme events affect urban areas more, necessitating more efficient decision-making and coordination Descriptive All C All

Puertas (2006) Colombia Urban (slums) IDP Conflict Chronic Use of existing services; care planning IDP with health care cards had less mental health issues than those without Cross-sectional Adults A Health access; mental health

Rashid (2000) Pakistan Urban General Natural (flooding) Acute International medical aid; use of existing services; care planning Major health challenges: water, sanitation, hygiene; diarrhoeal disease Descriptive All C Water, sanitation, hygiene; diarrhoeal disease

Ruiz-Rodriguez (2012) Colombia Urban IDP; General Conflict Chronic Use of existing services IDP and non-IDP have similar access to medicines Cross-sectional, comparative All A Access to medicines

Suriya (2012) India Urban General Natural (flooding) Acute Care planning Urban environments flood-prone Descriptive All C Health access