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An evidence review of research on health interventions in humanitarian crises

2021 Update

CONTENTS

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ABOUT ELRHA

We are Elrha. A global charity that finds solutions to complex humanitarian problems through research and innovation.

We are an established actor in the humanitarian community, working in partnership with humanitarian organisations, researchers, innovators, and the private sector to tackle some of the most difficult challenges facing people all over the world. We equip humanitarian responders with knowledge of what works, so that people affected by crises get the right help when they need it most. We have supported more than 200 world-class research studies and innovation projects, championing new ideas and different approaches to evidence what works in humanitarian response. Elrha has two successful humanitarian programmes: Research for Health in Humanitarian Crises (R2HC) and the Humanitarian Innovation Fund (HIF).

The R2HC aims to improve health outcomes for people affected by humanitarian crises by strengthening the evidence base for public health interventions. Our globally-recognised research programme focuses on maximising the potential for public health research to bring about positive change and transform the effectiveness of humanitarian response.

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ABOUT THE JOHNS HOPKINS CENTER FOR HUMANITARIAN HEALTH

The Johns Hopkins Center for Humanitarian Health is a unique and collaborative Johns Hopkins academic program conducted jointly by the Bloomberg School of Public Health, the School of Medicine, and the School of Nursing. It is hosted by the Department of International Health at the Bloomberg School of Public Health and draws upon a variety of disciplines, including epidemiology, demography, emergency and disaster medicine, health systems management, nutrition/food security, environmental engineering, mental health, political science, and human rights. The Center collaborates with a variety of organizations including national and international non-governmental organizations (NGOs), multilateral and UN organizations, and Governmental agencies, as well as other research institutions on field-based research and humanitarian projects.

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HUMANITARIAN HEALTH

LIST OF ACRONYMS

ASAQ	Artesunate-amodiaquine
BCC	Behaviour change communication
BRANCH	Bridging Research & Action in Conflict Settings for the Health of Women & Children
CATI	Case-area targeted interventions
CETA	Common Elements Treatment Approach
CPR	Cardiopulmonary resuscitation
CVD	Cardiovascular disease
DRC	Democratic Republic of the Congo
EMC	Ebola management centre
EMDR	Eye movement desensitisation and reprocessing
FP	Family planning
GBV	Gender-based violence
HAZ/LAZ	Height-for-age z-score/length-for-age z-score
HHER1	First Elrha Humanitarian Health Evidence Review
HHER2	Current Humanitarian Health Evidence Review (2021 update)
HIS	Heath information system
IASC	Inter-Agency Standing Committee
IDP	Internally displaced person
IPV	Intimate partner violence
IYCF	Infant and young child feeding
LMIC	Low- and middle-income country
MAM	Moderate acute malnutrition
MDA	Mass Drug Administration
mhGAP	Mental Health Gap Action Programme
MHPSS	Mental health and psychosocial support
MISP	Minimum Initial Services Package for Reproductive Health in Crises
MNH	Maternal and newborn health
MUAC	Mid-upper arm circumference
NCD	Non-communicable disease
NGO	Non-governmental organisation

NPWT	Negative pressure wound therapy
OPD	Outbreak-prone disease
PM+	Problem Management Plus
PoS	Point of source
PoU	Point of use
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
PTSD	Post-traumatic stress disorder
RCT	Randomised controlled trial
RDT	Rapid diagnostic test
RT-PCR	Reverse transcription-polymerase chain reaction
SAC	Safe abortion care
SCM	Spinal Cord Independence Measure II
SRH	Sexual and reproductive health
STI	Sexually transmitted infection
TORCH	Toxoplasmosis, other agents, rubella, cytomegalovirus and herpes simplex
UN	United Nations
WASH	Water, sanitation and hygiene
WAZ	Weight-for-age z-score
WHZ/WLZ	Weight-for-height/-length z-score

FOREWORD

Humanitarian crises threaten the health, protection and dignity of hundreds of millions of people worldwide.[i] In the face of pre-existing and emerging crises, and often working with limited resources, health responders and humanitarian health policymakers are under constant pressure to adapt humanitarian health responses to optimise their effectiveness, often with limited resources.

This has been particularly true of the global response to the COVID-19 pandemic and concurrent established and emerging humanitarian crises. This response has shown how evidence-informed policies and practices can have a positive impact on health and human rights – for example, through timely community-driven mitigation efforts such as handwashing and physical distancing, which have limited the spread of the virus, and community collaboration to determine public health restrictions deemed both appropriate and effective in different settings.[ii]

However, COVID-19 has also provided a stark reminder of the challenges associated with evidence-informed decision-making, particularly where competing political priorities are at play and where the available evidence is often limited or lacks local contextualisation.

To address gaps in the evidence base informing humanitarian health programmes, in 2013 we launched the Research for Health in Humanitarian Crises (R2HC) programme.[iii] The programme plays a crucial role in funding public health research in humanitarian settings and promoting the uptake of new evidence among decision makers, humanitarian practitioners and funders.

At that time, we also commissioned the first Humanitarian Health Evidence Review (HHER1), [iv,v] bringing together evidence on the effectiveness of public health interventions in humanitarian crises. The review identified the limited quality and quantity of humanitarian health intervention research over the preceding 30+ years. Its findings reinforced the need for the R2HC, and the importance of dedicated funding and technical support for the delivery and uptake of humanitarian research.

Since 2014, we have funded over 90 research studies in more than 45 countries, spanning issues as diverse as community-based Ebola virus disease control in the eastern Democratic Republic of the Congo, and hypertension and diabetes care for Syrian refugees in Jordan.

As we approach a decade since the creation of the R2HC, and in recognition of the persistent need for evidence-informed public health response in diverse and complex humanitarian settings, we have taken stock of humanitarian health research published since the first review was conducted. We are pleased to present here the second Humanitarian Health Evidence Review (HHER2), which reflects a collaboration between Elrha and the Johns Hopkins Center for Humanitarian Health, led by Shannon Doocy, Emily Lyles and Hannah Tappis.

This updated review has identified a substantial increase in humanitarian health intervention research across nine topic areas; 269 studies have been published since mid-2013, compared with 387 between 1980 and early 2013.

The growth in health research in humanitarian settings reflects sectoral appreciation of the importance of robust evidence to high-quality and effective health programming. Such evidence plays a critical role in efforts to reduce morbidity and mortality among people affected by humanitarian crises such as armed conflict and violence, environmental disasters and disease outbreaks.

HHER2 highlights where progress has been made in some topic areas, such as the continued growth of mental health and psychosocial support research, but also identifies persistent and emerging evidence gaps for which people-centred and context- and crisis-specific research is still urgently needed. People affected by humanitarian crises have diverse and often complex health needs, and we must continue to support efforts to ensure communities and health responders have timely access to the knowledge and resources to meet those needs.

We encourage frontline humanitarian practitioners to engage with the findings of this review, and to pinpoint research gaps where further evidence is needed to determine the effectiveness of humanitarian health activities. Researchers will recognise the substantial growth in health research in humanitarian settings. By working closely with frontline responders and the people most affected by humanitarian crises, they can refine a research agenda that is sensitive to the most pressing humanitarian health needs.

Finally, we hope that policymakers and donors will see in this review the scope for and potential of high-quality humanitarian health research. Continued investment in research in humanitarian settings is vital if we are to ensure effective, ethical and appropriate humanitarian response in the years ahead.

Jess Camburn, CEO, Elrha
Paul B. Spiegel, Director, Johns Hopkins Center for Humanitarian Health

Executive Summary

EXECUTIVE SUMMARY

Background

Humanitarian crises pose a major threat to health and dignity worldwide. There is a need for evidence-based interventions in humanitarian settings to maximise the impact of efforts to respond to pressing needs. The first Elrha Humanitarian Health Evidence Review (HHER1), led by a team from the London School of Hygiene & Tropical Medicine and published in 2015, was the first report to provide a comprehensive assessment of the evidence base for humanitarian health interventions in low- and middle-income countries (LMICs).

Recognising that a significant body of relevant research has been published since 2013 (the upper limit for publication dates included in the first review), we commissioned researchers from the Johns Hopkins Center for Humanitarian Health to update HHER1, documenting new evidence that has contributed to the public health evidence base informing humanitarian decision-making.

This review, HHER2, has assessed evidence for interventions in humanitarian crises in nine thematic areas:

communicable disease control

sexual and reproductive health (SRH), including gender-based violence (GBV)

non-communicable disease (NCD)

water, sanitation and hygiene (WASH)

mental health and psychosocial support (MHPSS)

health service delivery strategies

nutrition

injury and physical rehabilitation

health systems interventions

Methods

The review builds on HHER1. It comprises a thorough mapping of peer-reviewed literature on quantitative evaluations of the effectiveness of health interventions in humanitarian settings in LMICs published since HHER1 searches were completed in 2013; and an analysis of the critical weaknesses in the evidence base for sectoral areas of interest.

Evidence mapping included assessment of the depth and quality of evidence based on recognised methods for individual study quality appraisal and evaluating bodies of research. The systematic review methodology adheres to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement.

Overview

A total of 269 peer-reviewed articles met the eligibility criteria across all topics, with 81 (30%) reporting on multiple topics. This reflects a continuation of the increase in publication volume first documented in HHER1, though the volume of evidence and increase in publication rates vary substantially across topics.

Across all topics, the diversity of interventions studied has increased. To some extent, this reflects a shift in focus to some of the narrow evidence gaps identified in HHER1. However, it also reflects a general broadening of the scope of humanitarian interventions in recent decades and an increase in the publication of peer-reviewed research on more aspects of programming.

Choice of methodology, along with the quality of the evidence base, also vary substantially across and within topics. Experimental and quasi-experimental studies account for 98 (36%) included studies. Seventy-six (28%) articles were judged to have a low risk of bias in their study design. Gaps in information needed to assess the risk of bias in publications are common across topics; half of all included studies were deemed to have an unclear risk of bias due to insufficient reporting detail, for which reporting quality remains an area in need of improvement.

Communicable disease control

Seventy articles on communicable disease control interventions met the inclusion criteria and were reviewed, of which nine (13%) are experimental or quasi-experimental studies, and five (7%) are economic evaluations.

Communicable disease control literature focuses largely on Ebola virus disease and cholera. There is a complete or near absence of evidence for other diseases that comprise a significant portion of the disease burden in humanitarian settings such as respiratory infections, diarrhoeal diseases and malaria.

Vaccination campaigns are the most frequent intervention of focus (n=22, 31%), followed by surveillance and contact tracing (n=13, 19%). Few publications were identified that address communicable disease treatment, testing and other prevention measures.

Compared to HHER1, HHER2 has seen a shift away from experimental and quasi-experimental studies on treatment interventions in armed conflict contexts to a greater preponderance of observational studies during outbreak responses.

Recommendations for future research include prioritising diseases with a high morbidity and mortality burden or where there has been a failure to achieve disease control despite existing evidence. Focus is also needed on interventions to increase access to and ease of diagnostic testing and treatment interventions that have been shown to be effective in other contexts, but for which evidence in humanitarian settings is lacking.

Water, sanitation and hygiene

Twenty-one articles on WASH interventions met inclusion criteria and were reviewed, including four (19%) quasi-experimental studies, and one mixed-methods study that includes an economic assessment.

Most articles (n=15, 71%) report on water-related interventions, with 12 (57%) reporting on hygiene interventions with less emphasis on sanitation-related interventions. Interventions most frequently focus on water quality (n=12, 57%) and education or promotion (n=10, 48%). Less-represented intervention types include in-kind assistance, waste or wastewater management, environmental hygiene, water quantity or supply, and water storage.

HHER2 found more than three times as many WASH articles than HHER1. The distribution of articles assessing interventions related to water, sanitation, hygiene or a mix thereof is largely the same, though HHER2 has seen a diversification in intervention types.

A particular challenge with the WASH review was identifying publications that specifically report on health and nutrition outcomes. Most of the published evidence does not investigate or report on direct links to health outcomes. Future WASH research should include health and/or nutrition outcomes. Economic evaluation components are also needed, as cost-effectiveness is a persistent evidence gap.

Nutrition

Thirty-four articles on nutrition interventions met the inclusion criteria and were reviewed, of which nine (27%) articles report on randomised controlled trials (RCTs), eight (24%) on quasi-experimental studies and three (9%) on economic evaluations.

The largest proportion of articles focus on wasting, with far fewer articles on other nutrition topics. Supplementary feeding and cash transfers are the most common intervention areas of focus. HHER2 has seen greater representation of non-observational study types and increased representation of cash transfers compared to HHER1. Emphasis on wasting and supplementary feeding has remained consistent across the two reviews.

Previously identified evidence gaps that have not been well addressed by recent literature and which should be future research priorities include: interventions to improve breastfeeding; breast milk substitutes; re-lactation; complementary feeding strategies; nutrition education; bundled and multi-sectoral interventions; and targeting, specifically of older people and people with disabilities.

Sexual and reproductive health and gender-based violence

Thirty-two articles on SRH interventions met the inclusion criteria and were reviewed, of which seven (22%) articles report on RCTs, six (19%) on quasi-experimental studies and three (9%) on economic evaluations.

Over half (n=17, 53%) of the articles report on maternal and newborn health (MNH) interventions, with GBV interventions comprising an additional nine articles (28%). Half report on service delivery interventions and nearly a quarter on GBV prevention, with other intervention types minimally included.

HHER2 has seen a shift towards experimental and quasi-experimental study designs, as well as increased diversification by topic area and intervention type. MNH is the most frequent topic of focus in both reviews.

Recommendations for future research include: expanding research on service delivery strategies for multifaceted packages of care; more consistent assessment of SRH service quality and use of common frameworks and evaluation metrics; and diversifying population groups and humanitarian settings that are subject to research.

Mental health and psychosocial support

One hundred and four articles on MHPSS interventions met the inclusion criteria and were reviewed, making this the topic area with the largest evidence base, of which thirty-three (32%) articles report on RCTs, 20 (19%) on quasi-experimental studies and one on an economic evaluation.

Most articles (n=60, 58%) report on non-specialised service interventions. Psychological interventions are the most common intervention type (n=33, 32%). HHER2 has identified greater use of mixed-methods studies, as well as an expanded scope of outcomes of focus. Most studies include measurement of non-disorder-related psychosocial and psychological constructs, as well as non-specific psychological distress and wellbeing outcomes.

Recommendations for future research include continued support for replication studies to better understand the effectiveness of interventions and delivery modalities across diverse humanitarian settings and for varied subpopulations.

Also, research implementation and uptake recommendations outlined in *Elrha's Review and Assessment of Mental Health and Psychosocial Support Intervention Research in Humanitarian Settings*[283] and other recent consensus-based research prioritisation exercises should be embraced.

Non-communicable diseases

Fifteen articles on NCD interventions met the inclusion criteria and were reviewed, of which five (33%) report on RCTs and one on a quasi-experimental study. Two studies include costing outcomes. Five studies focus on both diabetes and hypertension, with an additional two solely on diabetes.

Other NCDs such as cancer, respiratory pathologies and other cardiovascular diseases are minimally included. Primary care provision is the most common intervention type, with most interventions delivered at health facilities.

HHER2 has seen a shift towards experimental and mixed-methods study designs, and from disease monitoring and management protocols to integration of NCDs into primary care provision. The Middle East is the main region of study in both reviews and most research focuses on populations affected by conflict.

Recommendations for future research include diversifying the focus of NCD research to include crisis-affected contexts in Africa and Asia, as well as other types of crises such as environmental disasters. NCD research during humanitarian crises should focus on access to care and intervention effectiveness for the most prevalent NCDs at primary care level, and should incorporate longer-term follow-up periods and health outcome measures.

Injury and physical rehabilitation

Six articles on injury and rehabilitation interventions met the inclusion criteria and were reviewed, with one article reporting on results from an RCT. Trauma care interventions account for half of the articles, with one article assessing post-trauma care and two focusing on rehabilitation.

HHER2 has seen a noticeable decrease in the volume of research conducted on injury and physical rehabilitation. Both reviews report primarily on studies occurring in settings affected by armed conflict. While most articles in HHER1 focused on orthopaedic care, HHER2 has identified a more diverse range of topics.

The low number of publications identified in the review suggests there is a broad need to expand research on injury and physical rehabilitation in humanitarian crises. Research on injury rehabilitation programmes is an important gap in the recent literature, as are studies conducted in humanitarian settings across Africa. Incorporation of longer-term outcome measures and costing would help to address persistent evidence gaps.

Health service delivery

Fifty-six articles on health service delivery interventions met the inclusion criteria and were reviewed, of which thirteen (23%) articles report on experimental and quasi-experimental studies, with an additional four reporting on mixed-methods studies with an experimental study component. Four articles are economic evaluations; and an additional article reports on a mixed-methods study with an economic evaluation.

Community-based and primary care interventions are the two most commonly studied levels of care. MHPSS is the most common intervention type, followed by SRH. Over half of the articles evaluate the effectiveness of service delivery models. One third evaluate specific protocols, procedures or clinical decision support tools.

HHER2 has identified diversification in study designs, including experimental, quasi-experimental and mixed-methods studies; and in the level of care studied, including community-based services in addition to facility-based care. The vast majority of articles in HHER2 focus on specific health needs, while most HHER1 articles addressed general health needs.

Research on resilience, sustainability and scalability of service delivery strategies is limited. There is a need for more multi-site, larger-scale and longer-term research on effective models of care in different contexts and among different subpopulations.

More systematic reporting on interventions to strengthen health service delivery and packages of care is needed to facilitate comparisons of intervention effectiveness across settings. Finally, more research on the effectiveness and costs of both focused and integrated models of community- and facility-based care is needed.

Health systems

Thirty-two articles on health systems interventions met the inclusion criteria and were reviewed, of which five (16%) are quasi-experimental studies, two (6%) RCTs and two (6%) economic evaluations. Fourteen articles report on health workforce interventions, with ten focusing on service delivery and nine on health information system interventions.

HHER2 has seen a slight shift from the preponderance of case studies in HHER1 to greater representation of experimental and quasi-experimental study designs. Most articles in HHER1 assessed interventions focused on policy areas of leadership and governance, while health workforce interventions are most represented in HHER2.

There is a need to expand health systems research generally. It should include the study of intervention strategies that address other essential health system building blocks, including health financing, access to medicines and medical products, vaccines and technologies, as well as leadership and management.

More systematic reporting on the roles that governments, humanitarian and development organisations, and other key stakeholders play in strengthening health systems in humanitarian crises, as well as the immediate and longer-term impacts of health systems interventions, would benefit the health systems evidence base.

Conclusions

There has been a notable increase in the publication of studies evaluating the effectiveness of humanitarian health interventions between HHER1 and HHER2. The topic areas with the most limited evidence base on intervention effectiveness remain NCDs and WASH.

The types of interventions studied has increased across all topic areas. An overarching theme is the challenge of implementing high-quality and well-reported humanitarian health research. Humanitarian contexts present significant challenges to research design – particularly in relation to experimental designs – and implementation.

Improvements in reporting and intervention description could make research more impactful. The collective aim of humanitarian health researchers should be to improve the utility of research findings, which requires inclusion of far more context, methodology and intervention information to allow for the replication of successful interventions, along with clear limitations and generalisability statements.

Of critical importance for intervention research is the need to prioritise investment in research where study designs allow for the characterisation and attribution of changes resulting from a particular intervention. Researchers should try to incorporate standard indicators and should also consider the feasibility of measuring longer-term outcomes to enable better comparison of the effectiveness of different interventions against one another, as well as intervention effectiveness across different contexts and populations over time.

Shifts in the evidence base indicate efforts to address gaps identified in HHER1. However, the variation in research across and within topic areas does not necessarily reflect the health issues of greatest concern or bottlenecks to quality health service delivery in humanitarian settings. Several previously identified and well-established evidence gaps have yet to be addressed. Notably, there is a need for additional research on health service delivery – in particular, task shifting, and other strategies for scaling up evidence-based interventions and supporting health system resilience. Similarly, economic evaluations continue to make up a small proportion of studies (13 articles, 5% of publications). This is a significant limitation to the current evidence base given the importance of cost, particularly in settings where humanitarian needs exceed available financial resources.

Many research priority-setting efforts are topic- or sector-specific. To bring about change in humanitarian health programming and policy, there is a clear need to prioritise expansion of cross-cutting topics – namely, health service delivery, health systems and the study of cost-effectiveness in humanitarian health research.

1
Introduction

1. INTRODUCTION

Humanitarian crises continue to pose a substantial threat to health and wellbeing worldwide. The number of people displaced has consistently increased over the past decade and funding requirements for United Nations (UN)-coordinated appeals are at an all-time high, reaching US$30.4 billion in 2019.1 Despite increasing needs, humanitarian assistance funding dropped 5.3% from US$31.2bn in 2018 to US$29.6bn in 2019, the first such decline since 2012.1 Coupled with the increased strain introduced by the coronavirus (COVID-19) pandemic, there remains a need for evidence-based interventions in humanitarian settings to maximize the impact of efforts to respond to growing needs.

While nearly all humanitarian responses historically required a substantial health repose, the COVID-19 pandemic has emphasised the critical importance of an evidence-informed, effective health response. This is often hindered by a lack of sound evidence for effective interventions in humanitarian settings. Although efforts to improve the evidence base for humanitarian responses have increased in recent years, it remains limited both in quantity and quality.

The first Elrha Humanitarian Health Evidence Review (HHER1), led by a team from the London School of Hygiene & Tropical Medicine, was the first report to provide a comprehensive assessment of the evidence base for humanitarian health interventions in LMICs. It was published as a report in 2015[2] and a series of peer-reviewed articles.[3–7] Recognising that a significant body of relevant research has been published since 2013 (the later limit for publication dates included in the first review), Elrha commissioned the Johns Hopkins Center for Humanitarian Health to conduct a second Humanitarian Health Evidence Review (HHER2) to document new or supplementary evidence to inform the public health evidence base on which humanitarian decisions are made.

Although efforts to improve the evidence base for humanitarian responses have increased in recent years, it remains limited both in quantity and quality.

2
Methods

2. METHODS

Objectives

The objective of this review is to provide a thorough mapping of the current quality and depth of evidence examining the effectiveness of health interventions in humanitarian settings in LMICs published in peer-reviewed journals since 2013.

Title registration and review protocol

The protocol for this systematic review was registered in PROSPERO on 12 June 2021 and is available on the PROSPERO database.

Overview of approach

This review builds upon HHER1 published in 2015. It consists of a thorough mapping of peer-reviewed literature on the effectiveness of health interventions for populations affected by humanitarian crises in LMICs published since HHER1 searches were completed in 2013; and an analysis of the critical weaknesses in the evidence base for sectoral areas of interest. Evidence mapping included assessment of the depth and quality of evidence based on recognised methods for individual study quality appraisal and evaluating bodies of research. The systematic review methodology adheres to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement.[8]

Criteria for considering studies for this review

The Campbell Collaboration and Cochrane approaches to systematic reviewing[9–11] were followed, with an extension to include observational and mixed-methods studies. Per the Terms of Reference, the updated evidence review included only peer-reviewed literature.

The review was limited to new and/or supplementary evidence generated since 2013 to capture developments in relevant research published since HHER1. The review focuses on evidence from humanitarian crises. Within these parameters, a series of systematic reviews was performed on interventions addressing nine thematic areas covered in HHER1: (1) communicable disease control; (2) water, sanitation and hygiene (WASH); (3) nutrition; (4) sexual and reproductive health (SRH), including gender-based violence (GBV); (5) mental health and psychosocial support (MHPSS); (6) injury and physical rehabilitation; (7) non-communicable disease (NCD); (8) health service delivery strategies; and (9) health systems interventions.

Notably, HHER2 incorporated search terms related to palliative care, but no studies were identified that met the inclusion criteria and thus a dedicated chapter on palliative care has not been included.

Types of studies

Types of studies considered eligible for inclusion included experimental and quasi-experimental study designs that allow for attribution, economic evaluations (cost utility, cost benefit and cost effectiveness analyses) that assess the efficiency of an intervention in a way that can be compared with alternatives or benchmarks, as well as observational or descriptive studies and mixed-methods studies that evaluate intervention effectiveness. Only studies involving primary data were considered eligible; review articles were excluded from the search results synthesis but referenced in discussion of findings, particularly as they relate to the scope of the literature by sector and for the purpose of comparison of results.

Types of participants

The review focused on people affected by humanitarian crises occurring in LMICs. For this review, humanitarian emergencies (or crises) are broadly defined to include armed conflict, environmental disasters and major infectious disease outbreaks. A broader literature from humanitarian settings was also included. For our purposes, humanitarian settings are defined as conflict-affected states, complex emergency settings, camps and settlements for refugees and internally displaced people (IDP), camps and settlements, and urban settings where refugees and IDPs are hosted. Studies focused exclusively on preparedness or on the post-conflict/post-disaster reconstruction period were excluded. Affected populations could include non-displaced people; people displaced within their home country; or refugees displaced in neighbouring countries, regardless of the host country income level (e.g. Syrian refugees in Greece).

Types of interventions

Interventions are broadly defined to include any programmes, projects or activities explicitly seeking to improve health systems; health service delivery; and/or health outcomes, including nutrition, among emergency-affected populations.

Types of outcome measures

Outcome measures included individual (e.g. mortality, disease control) or population-level (e.g. contraceptive prevalence rate) health outcomes, as well as health programme outputs (e.g. patients treated per protocol). Given the aim of characterising evidence on the effectiveness of health interventions, output measures were deemed insufficient to warrant quality appraisal and were not included*.

Other criteria for including and excluding studies

The review excluded any studies published before 30 April 2013 in order to capture research published since the cut-off date for HHER1. Only English language publications were included based on the experience of HHER1 where few studies published in other languages were identified. The inclusion and exclusion criteria for the review are summarised in Table 2.1.

*HHER1 captured "category C" studies, which reported on outputs but not on outcomes. The Nutrition and Health Service Delivery chapters in HHER2, which report on outcome measures, compare against both output and outcome data from HHER1. All other HHER2 chapters compare against only outcome data from HHER1.

Table 2.1 Inclusion and exclusion criteria

	Include	Exclude
Intervention	• Communicable disease control • Non-communicable disease (NCD) • Injury and physical rehabilitation • Nutrition • Sexual and reproductive health (SRH) • Gender-based violence (GBV) • Mental health and psychosocial support (MHPSS) • Health service delivery strategies • Health systems strengthening • Water, sanitation and hygiene (WASH)	• Camp coordination/ management • Early recovery • Education • Emergency communications • Food security • Preparedness • Protection • Reconstruction • Shelter • Logistics
Population	• Emergency-affected (non-displaced) • Internally displaced populations • Refugees	• Not emergency-affected • Asylum seekers in high-income countries • Resettled refugees
Type of study	• Economic evaluations • Experimental • Quasi-experimental • Mixed-methods studies (that allow for attribution)	• Systematic reviews • Case studies • Opinions/perspectives • Qualitative studies
Outcomes/ other factors	• Individual health indicators • Population health indicators • Health service/programme outputs (in cases where attribution is possible)	• Non-health-related outcomes
Publication dates	1 May 2013–30 April 2021	30 April 2013 and before*
Publication language	English	All others

Search methods for identification of studies

We conducted an extensive systematic search for peer-reviewed literature following the guidelines provided in the Campbell Collaboration's Information Retrieval Methods Guide.[12] In the process of developing the search strategy, approaches from other recent relevant reviews were considered as the search strategy was refined and adapted, in particular, HHER1, The Lancet and Johns Hopkins Center for Humanitarian Health's Humanitarian Health Digest, and the Bridging Research & Action

*An updated search in advance of the 2015 publication of HHER1 identified a small number of papers from later in 2013 and 2014 (n=6). There was no duplication between these papers and papers included in HHER2.

in Conflict Settings for the Health of Women & Children (BRANCH) consortium's series of systematic reviews on reaching conflict-affected women and children with health and nutrition interventions published in The BMJ.[13,14] A common search strategy was used across the different thematic areas to identify studies to address the review objectives.

Electronic searches

Databases searched for this review included MEDLINE, Embase and Global Health. Search strategies included terms related to (a) topic/intervention, (b) setting and (c) population. In addition to database searches, the team reviewed bibliographies from relevant systematic and non-systematic reviews for additional studies that were not identified using the search strategies described above. A search strategy mapping and detailed search strategies for each database are provided in Annex 1.

Data collection and analysis

Study screening, data extraction and quality appraisal were performed using the Covidence Systematic Review Software Platform,[15] which is identified as the "primary screening and data extraction tool" for Cochrane reviews.

Selection of studies

Two study team members independently screened all titles and abstracts for relevance. Discrepancies were resolved by a third reviewer where necessary. Two reviewers then screened the full texts of potentially relevant publications to determine eligibility for inclusion.

Data extraction and management

Data extraction included information on study designs and their strengths and weaknesses as necessary to facilitate critical appraisal of study quality, as well as types of interventions and outcomes, intervention and study settings (geographic locations and types of humanitarian settings), and target population groups. Data extraction also included information on intervention characteristics such as service delivery or implementation sites (e.g. system-level, facility-based, community-based, mobile/outreach, self-care), types of personnel involved (e.g. health professional cadre, lay personnel) and whether the intervention was part of a broader multisector programme or intervention strategy, as applicable. Data extraction was conducted by a single reviewer, with a second reviewer performing a quality and completeness assessment. The complete data extraction tool is provided in Annex 2.

Critical appraisal of included studies

Included studies were stratified into three groups for critical appraisal: (1) experimental or quasi-experimental studies evaluating the effectiveness of health or public health interventions for achieving sector-specific or cross-cutting outcomes; (2) quantitative studies measuring the cost, cost-efficiency, cost-effectiveness, cost-utility or cost-benefit of public health interventions; and

(3) observational or mixed-methods studies evaluating the effectiveness of health or public health interventions for achieving sector-specific or cross-cutting outcomes. Standardised criteria and templates used for quality appraisal are provided in Annex 3. Studies with multiple purposes and study designs were appraised for each relevant classification.

- Experimental or quasi-experimental studies measuring the effectiveness of public health interventions for achieving sector-specific or cross-cutting outcomes were assessed using criteria adapted from risk-of-bias tools included in The Cochrane Handbook of Systematic Reviews of Interventions.[12]
- Studies measuring the cost-effectiveness, cost-utility, cost-benefit or cost-efficiency of public health interventions were assessed using criteria adapted from the Campbell Collaboration Economic Methods Policy Brief.[16]
- Observational or mixed-methods studies evaluating the effectiveness of health or public health interventions for achieving sector-specific or cross-cutting outcomes were assessed using an adapted version of the Mixed Methods Assessment Tool development by Pluye et al. (2011) at McGill University, which is recommended by Cochrane, to critically appraise the methodological quality of such research studies.[12,17]

For all studies, the risk of bias impacting the results or conclusions of a study was categorised as low, moderate, high or unclear. Studies were judged to have low a risk of bias if classified as having a low risk of bias for all criteria specific to that study design. Studies were judged to have a moderate risk of bias if reviewers did not find a high risk of bias in any criteria but were uncertain or identified concerns related to at least one criterion. Studies were judged to have a high risk of bias if identified as such for at least one criterion or if there were concerns across multiple criteria in a way that substantively affected confidence in the results. Finally, studies were classified as having an unclear risk of bias if there was too little information on which to base a judgement for the primary outcome(s) of interest. Per Cochrane guidance, to be classified as having a low risk of bias a study must have a low risk in all domains; in many cases articles were classified as having an unclear risk of bias because available information was insufficient to make classifications for one or more domains.

Risk-of-bias assessments were performed by a single reviewer, with a second reviewer performing a quality and completeness assessment and making overall risk-of-bias judgements. Articles were appraised based solely on information included in the article itself; team members did not search for additional documentation or contact study investigators to clarify incompletely reported information.

Data synthesis

Findings from the series of systematic reviews for public health topics are presented individually by topic area along with a synthesis of findings and analysis of the overall evidence base for health interventions in humanitarian settings. Analyses for each public health area were conducted in parallel and presented in separate sections in this report. In many cases, articles were classified as relevant to multiple topic areas and are discussed, as relevant, in multiple sections of the report. This was particularly true for health service delivery, where many studies evaluating health service

delivery strategies focused on services for a particular health issue (e.g. SRH or MHPSS service-delivery interventions). Articles evaluating system-level interventions to improve health service delivery (including health workforce capacity strengthening) or evaluating the effectiveness of service delivery at scale were included in both health service delivery and health systems reviews. Also of note is the increasing attention to cash transfer interventions within the context of health and nutrition programming; cash-based interventions were classified by outcome measure/focal topic (e.g. nutrition) to ensure that evidence was incorporated under appropriate topic areas. Content for these individual sections consists of comprehensive summaries of the body of evidence in the respective topic area, including summaries of the characteristics of identified studies based on descriptions as reported by authors and key themes identified in the research with a focus on the quantity and quality of the evidence base, including strengths and gaps in the available evidence. Evidence of the effectiveness of specific interventions is also summarised within topic areas in instances where several studies reporting similar outcome measures were identified in the review. Changes in the quantity and quality of evidence on each topic since HHER1 in 2013 were also assessed; however, this was limited by methodological divergences between the two reviews, particularly in the use of different quality appraisal tools, definitions of 'effectiveness' and typologies used to classify interventions. Based on this synthesised mapping, critical weaknesses were identified and recommendations for future research developed. A comprehensive synthesis of findings and analysis of the overall evidence base for health interventions in humanitarian settings is also provided, integrating and mirroring content in the previous individual topical sections (e.g. summaries of identified studies and key themes, analysis of the quantity and quality of available evidence, changes in the evidence base, etc.).

Methodological limitations

This systematic review has a number of limitations. First, searches were limited to English-language publications, potentially missing evaluations published in other languages. Second, inconsistent levels of detail in reporting on study design, methods and outcomes limited the depth of analyses that could be conducted within and across health topic areas. Nearly half of included studies were classified as having an unclear risk of bias due to lack of information on critical appraisal criteria recommended by Cochrane for experimental, quasi-experimental, mixed-methods and economic evaluations. Although we used validated appraisal tools and sought consensus among review team members when necessary, overall risk-of-bias judgement remains a somewhat subjective process. In cases where information needed to appraise individual studies was lacking and there were concerns in one or more domains, studies were classified as having an unclear risk of bias (too little information on which to base a judgement for the outcome of interest) rather than a moderate risk (raising some concerns in at least one domain but not high risk in any domains). While this approach may have mitigated inconsistencies in classification, the high proportion of studies with an unclear risk of bias limits conclusions that can be drawn about the quality of evidence within and across health topics.

Although we report on changes between HHER1 and HHER2, caution should be exercised in drawing direct comparisons between the two reviews due to several notable differences in methodologies. First, search terms and inclusion criteria were broadened for HHER2. HHER1 included only primary quantitative studies including economic analyses, while HHER2 expanded inclusion criteria to consider mixed-methods studies. HHER1 also focused exclusively on evaluations

of interventions in LMICs, while HHER2 broadened inclusion criteria to also consider evaluations of interventions for populations affected by humanitarian emergencies occurring in LMICs, including interventions for refugees displaced from LMICs to high-income countries (e.g. articles evaluating MHPSS interventions for Syrian refugees in Greece were included). Third, articles included in HHER1 were only described in relation to one health topic, whereas nearly one-third (30%) of articles included in HHER2 were associated with multiple health topics of interest. Allowing inclusion of articles in multiple topic-specific reviews provides a more comprehensive summary of the state of evidence on effectiveness of interventions in each topic area, but limits comparability between HHER1 and HHER2. Finally, in some chapters HHER1 and HHER2 used different typologies for classifying intervention types and characteristics of personnel involved. In general, decisions to deviate from HHER1 were made in consultation with Elrha and the HHER2 advisory committee to be as inclusive as possible and to reflect development in humanitarian health programming over the past eight years.

Even with broadened search terms and inclusion criteria, there were studies meeting review criteria that were not captured by the HHER2 search strategy. For example, upon reviewing the draft findings for the WASH topic area, expert reviewers noted articles that were potentially missing from those identified and included in the review. Based on their concerns and recommendations, the review team conducted an assessment of the suggested publications, as well as publications on the WASH cluster website and identified nine articles that were published in journals indexed in the databases searched, but which were not identified in our searches (Annex 7). Additionally, articles evaluating interventions to address epidemic-prone diseases in LMICs may not have been captured if authors did not identify study populations or settings as emergency affected or humanitarian crises using terms in the search strategy.

Reviewers also noted topics that they were surprised not to see included among review findings, such as palliative care. Similarly, while the search strategy was expanded with HHER2 to include terms related to palliative therapy and palliative care, no studies evaluating interventions to improve palliative care were identified. This may reflect limited research on the topic in humanitarian contexts, research focusing primarily on describing experiences of care and not on evaluating interventions, or of limitations in our search strategy.

Finally, it is critical to recognise that the scope of this review was limited to humanitarian settings and that it is not all encompassing. It is likely that there is also a body of relevant research from LMICs and other settings that should be consulted to garner a more complete understanding of the extent of available evidence for most topics.

As the primary aim of this review is to identify how the quantity and quality of research across the humanitarian health sector has changed in recent years, and to identify broad trends across topic areas related to studies that assess the effectiveness of interventions exclusively in humanitarian settings, the review is not intended as a complete synthesis of the evidence base that should inform our understanding of specific humanitarian health practices. Such a complete synthesis must necessarily incorporate a broader range of evidence sources, including knowledge deemed transferable from non-crisis-affected contexts.

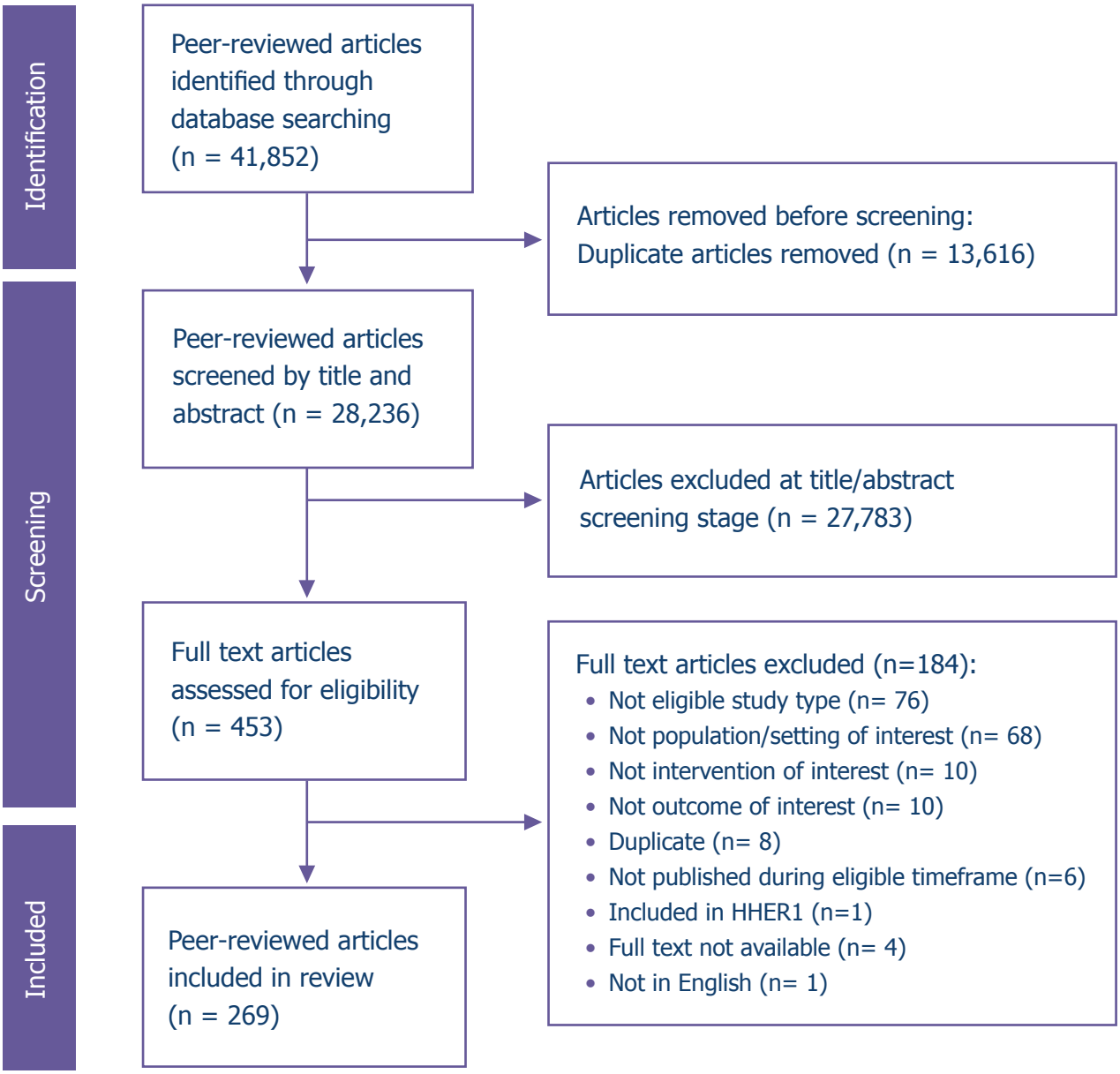
3
Results Overview

3. RESULTS OVERVIEW

Characteristics of Included Studies

Our database search retrieved 28,236 indexed publications, of which 269 met review inclusion criteria. Article identification and screening flow details are summarized in Figure 3.1.

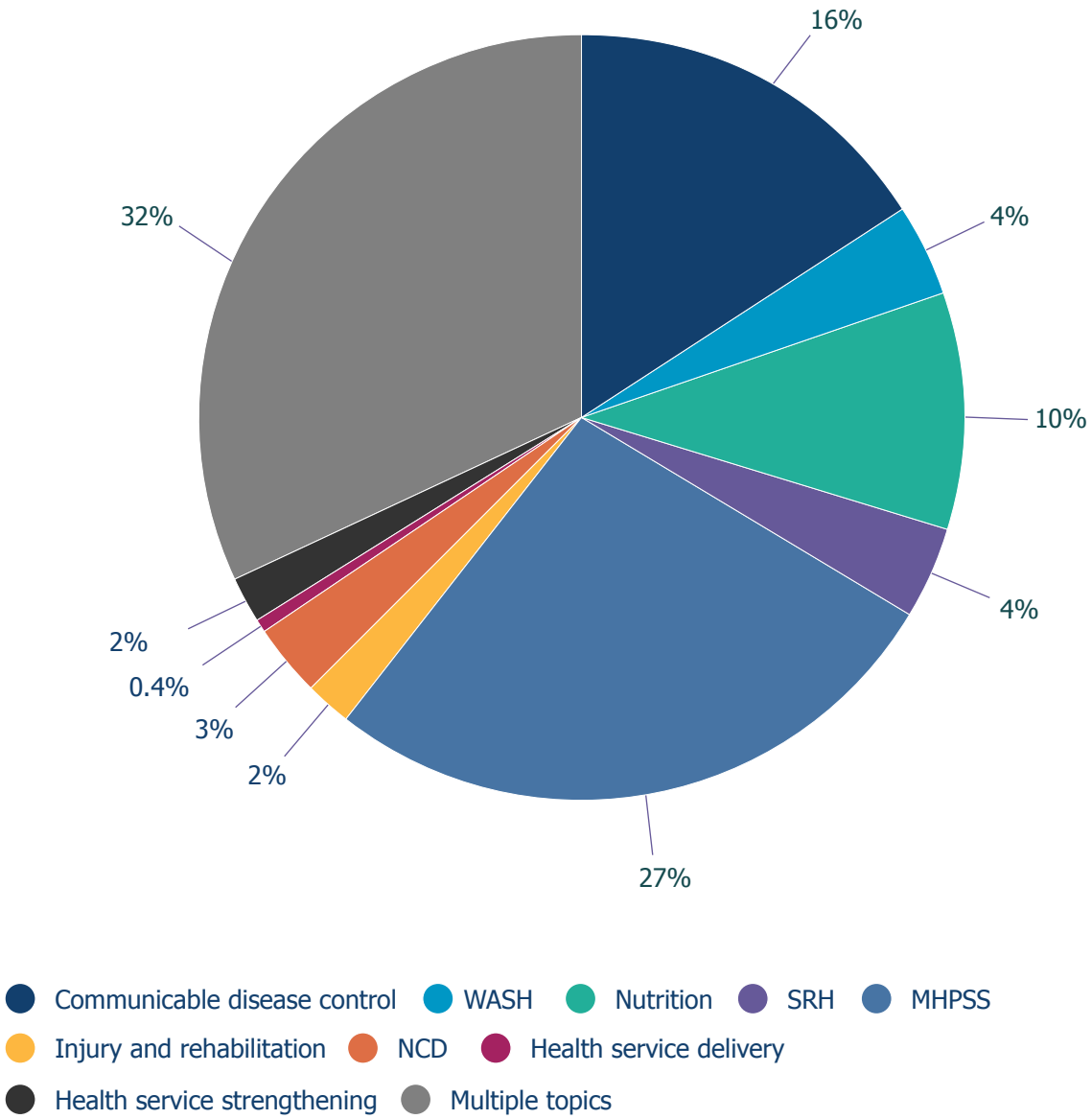
Figure 3.1 PRISMA Flow Diagram for HHER2



Of the 269 peer-reviewed articles meeting eligibility criteria across all topic areas, 81 (30%) reported on multiple topic areas and 188 (70%) reported on a single topic. The number of articles included in each topic area are presented in Figure 3.2 and were as follows:

- Communicable disease control (n=70, including 24 cross-listed with other topics)
- Water, sanitation, and hygiene (n=21, including 11 cross-listed with other topics)
- Nutrition (n=34, including 5 cross-listed with other topics)
- Sexual and reproductive health, including GBV (n=32, including 21 cross-listed with other topics)
- Mental health and psychosocial support (n=104, including 31 cross-listed with other topics)
- Injury and rehabilitation (n=6, including 1 cross-listed with other topics)
- Non-communicable disease (n=15, including 8 cross-listed with other topics)
- Health service delivery (n=56, including 54 cross-listed with other topics)
- Health systems (n=32, including 27 cross-listed with other topics)

Figure 3.2 Publications Included in HHER2 by Topic Area (n=269)

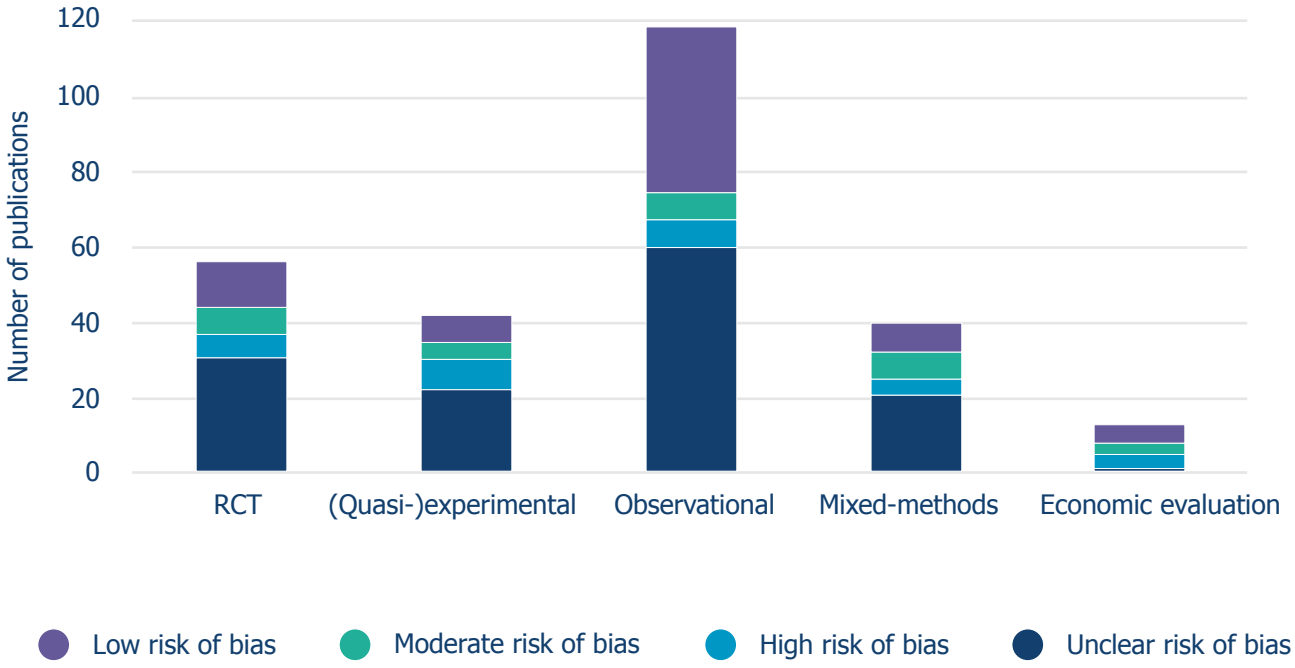


Study design and risk of bias

Included articles were categorised by study design and risk of bias assessed accordingly for each article. Experimental and quasi-experimental studies accounted for 98 (36%) included studies, while observational studies accounted for 118 (44%), mixed-methods studies accounted for 40 (15%) and economic evaluations accounted for 13 (5%).

Overall, 76 (28%) articles were judged to have a low risk of bias for their study design, 29 (11%) a moderate risk and 30 (11%) a high risk. The remaining 134 (50%) were determined to have an unclear risk of bias due to lack of information available in the article. Figure 3.3 summarises included publications on the effectiveness of humanitarian health interventions by study design and risk of bias.

Figure 3.3 Study design and risk of bias for included publications



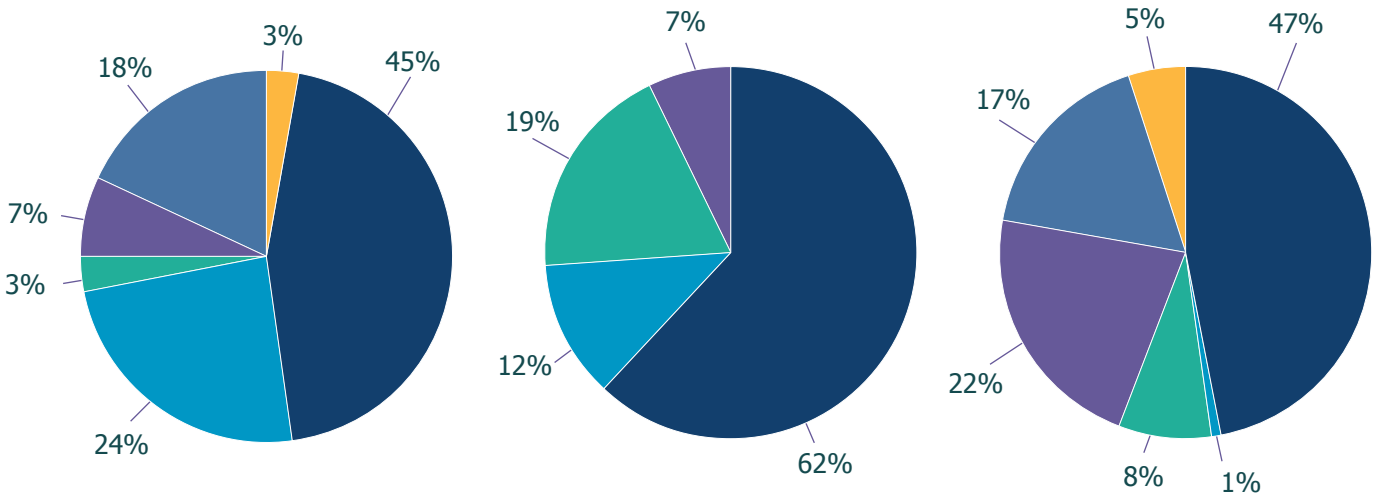
Study populations and contexts

The distribution of included publications by geographic region, type of humanitarian crisis and population of focus is presented in Figure 3.4. With respect to context, the largest proportion of publications included in HHER2 reported on interventions in Africa (n=121, 45%), followed by Asia (n=64, 24%), the Middle East (n=49, 18%), Latin America and the Caribbean (n=19, 7%) and Europe (n=7, 3%), with the remaining nine (3%) articles reporting on interventions implemented in multiple regions. An overview of regional classification of countries in which research was conducted for all HHER2 publications is provided in Annex 4 along with a map highlighting study countries for all publications and individual maps for each topic area.

The majority of included articles (n=166, 62%) reported on interventions in areas affected by armed conflict, followed by disease outbreaks (n=50, 19%) and environmental disasters (n=33, 12%). Nineteen (7%) articles reported on interventions occurring in areas affected by multiple types of crises and one (0.4%) did not describe the study setting in sufficient detail for classification.

In terms of population types of focus, nearly half of the included articles reported on interventions for emergency-affected (non-displaced) populations (n=126, 47%); this was followed interventions for refugee populations (n=60, 22%) and IDPs (n=22, 8%). Forty-five (17%) articles reported on interventions for multiple population types and three (1%) reported on interventions for host community populations. Similar proportions of articles reported on interventions in urban (n=90, 33%) and rural areas (n=77, 29%) with 35 (13%) that reported on interventions in both urban and rural areas; urban or rural setting was unclear in 67 (25%) articles. Studies most commonly reported on interventions occurring in non-camp settings (n=170, 63%), followed by camp settings (n=55, 20%), and interventions occurring in both camp and non-camp settings (n=29, 11%); study location was not specified in 15 (6%) publications.

Figure 3.4 Distribution of HHER2 publications by region, crisis and population type



Key themes

Authorship

Lead and last authors' affiliated countries were examined for the overall body of included literature to better understand representation in humanitarian health research. Of all 269 included articles, 114 (42%) had a lead or last author affiliated with an institution in an LMIC; 88 (33%) articles' lead author and 85 (32%) articles' last author were affiliated with an institution in a LMIC. For 98 (36%) articles, either the lead or last author was affiliated with an institution in the crisis-affected or host country in which the study was based; 78 (29%) articles' lead author and 72 (27%) articles' last author were affiliated with the affected/host country.

Quantity of evidence

The volume of peer-reviewed publications on the effectiveness of health interventions in humanitarian crises continued to increase after HHER1 was completed in 2013. The number of articles published in the past eight years equates to 78% of the articles identified in HHER1, which spanned a 32-year period. This translates to an increase from an average of 11 humanitarian health intervention effectiveness articles annually in the first review period to an average of 34 articles annually since then.

The volume of evidence and increase in publication rates varied substantively across topics. The average number of publications per year in the review period increased at least two-fold from HHER1 to HHER2 for all topics except injury and rehabilitation, which saw a 50% decrease in publication volume from HHER1 to HHER2. For nutrition and communicable disease control (the topics with the most articles included in HHER1), this was a modest increase from an average of 2–4 and 4–5 articles per year, respectively. For other topic areas, such as WASH and SRH, there was a much more dramatic increase. The number of articles on the effectiveness of WASH interventions increased from an average of one publication every five years during the HHER1 review period to an average of two publications per year in HHER2. The number of articles on the effectiveness of SRH interventions similarly increased from an average of one publication every two years during the HHER1 review period to an average of four publications per year in this review.

Quality of evidence

The quality of the evidence base also varied substantively across and within topic areas. In general, though the number of publications on experimental and quasi-experimental or high-quality mixed-methods studies increased in many topic areas, so did the number of publications with less robust study designs and weak descriptions of methodologies. Gaps in information needed to assess risk of bias of publications were common across topic areas and half of all included studies were deemed to have an unclear risk of bias due to insufficient reporting detail, suggesting that reporting quality remains an area in need of improvement.

Topic areas of focus

Within all topic areas, there was an increase in the diversity of interventions studied. To some extent, this reflects shifts in focus to narrow evidence gaps that were identified in HHER1. However, it also reflects a general broadening of the scope of humanitarian interventions in recent decades and an increase in peer-reviewed publication of research on more aspects of programming. For example, one of the main recommendations emerging from HHER1 was the need for more evidence on the feasibility and effectiveness of inter-sectoral interventions. Synthesis of studies included in this review suggests that progress has been made in advancing evidence of links between WASH, communicable diseases and nutrition. Of the 21 WASH articles in HHER2, eight were also included in the communicable disease control section and two others were included in the nutrition section.

Along with a notable increase in publication of studies evaluating effectiveness of humanitarian health interventions, shifts in the research topics and interventions of focus were observed from HHER1 to HHER2. Overall, the most common topic of focus shifted from communicable disease control, which comprised 30% of the studies in HHER1, to MHPSS, which accounted for 38% of the studies in HHER2. Both NCDs and WASH remained among the topics with the smallest evidence base. A summary of changes in the evidence base by topic area is as follows, with subsequent chapters providing an in-depth review of the evidence identified in HHER2, comparison of evidence across HHER1 and HHER2, discussion of evidence gaps and recommendations for future research.

- **Communicable disease control** research shifted from a focus on malaria, tuberculosis and measles to Ebola and cholera, and from disease treatment to a more diverse range of interventions including education, testing, surveillance, contact tracing and vaccination.

- **WASH** research expanded substantially from HHER1 to HHER2 in terms of volume and diversity of both topical area (water, sanitation hygiene) and interventions within each of these areas. Despite the recent proliferation of WASH studies, the absence of evidence on the effectiveness of WASH interventions on health and nutrition outcomes – an evidence gap identified in HHER1 – persisted in HHER2.

- **Nutrition** research in HHER2 was moderate in volume but identified breastfeeding/infant and young child feeding (IYCF) and stunting among the three most common topical areas (after wasting), suggesting an important shift to address known evidence gaps, where lack of evidence for IYCF, moderate acute malnutrition (MAM) and stunting interventions were identified in HHER1.

- **SRH** research expanded beyond a narrow focus on capacity strengthening of health workers to provide maternal and newborn health (MNH) and family planning services to include evaluations of a wider array of interventions addressing these topics. In addition, HHER2 studies addressed GBV, safe abortion care and components of the Minimum Initial Services Package for Reproductive Health in Crises, which were areas identified by HHER1 where intervention effectiveness was lacking.

- **MHPSS** research during the period covered by HHER1 was primarily focused on interventions addressing mental disorders in one individual at a time. In recent years, this focus has expanded substantially, with a notable increase in studies evaluating the effectiveness of group interventions and improved framing of outcome measures in terms of mental health and wellbeing.

- **NCD** research remained limited in HHER2, with only three conditions addressed (diabetes, hypertension and heart failure), which reflects a decrease in diversity compared to HHER1 where research covered twice as many chronic conditions. There was also a shift in the types of interventions evaluated. The majority of studies included in HHER1 evaluated established disease management protocols and monitoring of NCD cohorts. The studies included in HHER2 suggest that in recent years the focus of research has expanded to evaluate NCD health education and effectiveness of methods for integrating NCDs into primary care provision.

- **Injury and rehabilitation** accounted for very few studies included in HHER2, though these studies covered a wider array of acute trauma care procedures and rehabilitation interventions compared to studies included in HHER1, which were substantially more numerous but focused primarily on surgical care.

- **Health service delivery** saw a substantial expansion between HHER1 and HHER2 with a notable increase in publications from 2015 onwards. Both HHER1 and HHER2 included articles evaluating health service delivery interventions at multiple levels of the health system. In HHER2, there was a relatively even split between research on facility-based care (including primary, secondary and specialised care) and community-based or outreach services, which were not evaluated in HHER1. In HHER1, interventions addressing general health needs accounted for the majority of articles; this remained an area of greater evidence in HHER2; however, more literature emerged on specific health needs, most notably MHPSS and SRH.

- **Health systems** research volume was similar overall across the two reviews, with a notable increase in attention in the past decade. There was a shift in focus away from leadership and governance, which was where evidence was concentrated in HHER1 but was not an area of investigation for any study in HHER2. Instead, recent research has continued to focus on the health workforce (an area of concentration from HHER1) but also diversified to address new topics including health information systems (HIS) and service-delivery interventions.

4

Communicable Disease Control

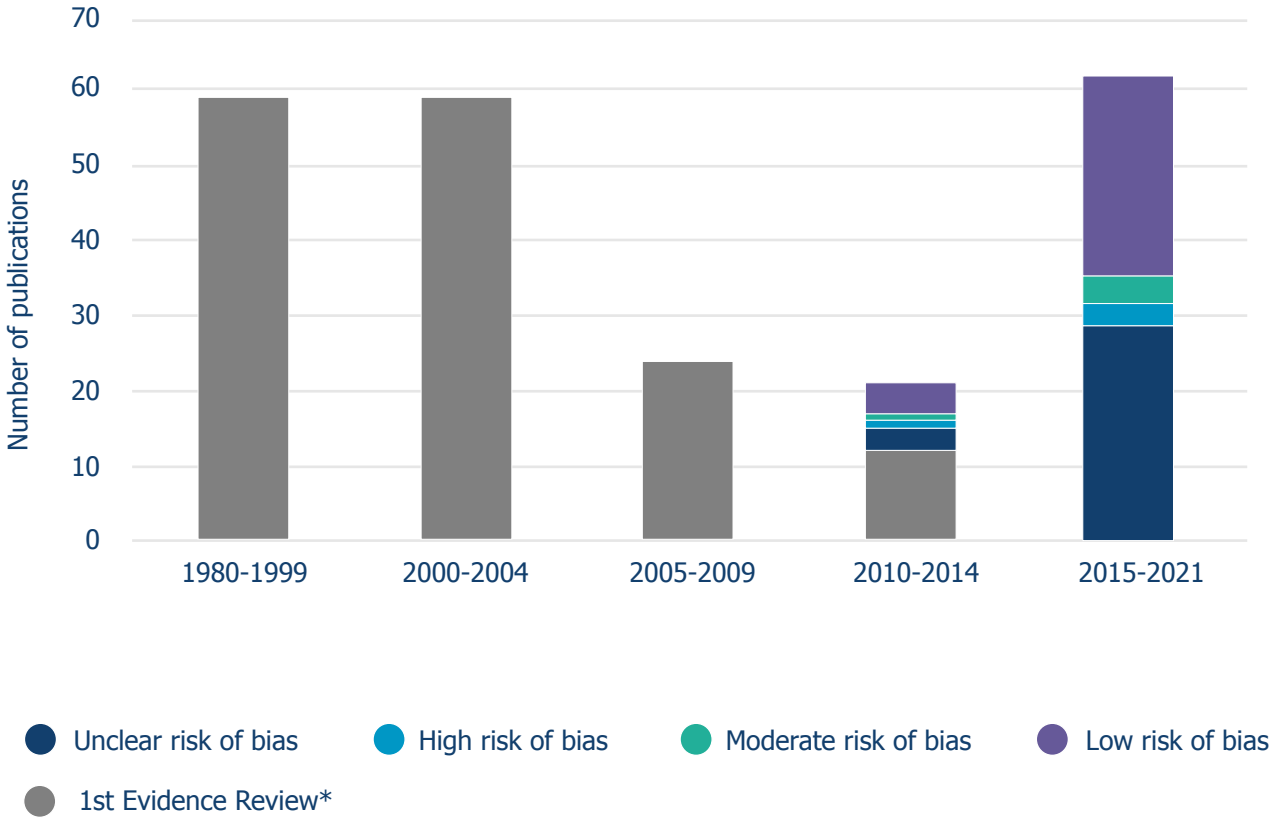
4. COMMUNICABLE DISEASE CONTROL

70 Peer-reviewed publications in 8 years

Overview of literature search findings

Of the 269 peer-reviewed articles meeting eligibility criteria across all topic areas, 70 (26.0%) reported on communicable disease control. The 70 peer-reviewed articles present findings from 69 unique studies; a detailed summary of included studies is presented in Annex 5. Of the included publications, seven articles were published from 2013–2014, with 35 published from 2015–2017 and 28 from 2018–2021. The number of communicable disease control articles published in the past eight years equates to 53% of the articles identified in HHER1 (n=131), which spanned a 32-year period; this translates to an average of 4.1 and 8.8 publications per year in the first and second reviews, respectively. This progression in publication volume is illustrated in Figure 4.1, where a substantial increase in publication volume is observed in 2015–2021, which is largely attributable to publications stemming from the 2014–2016 West Africa Ebola outbreak.

Figure 4.1 Quantity and quality of communicable disease control publications over time



*Non-comparable quality appraisal was conducted in HHER1 (1980-2013).

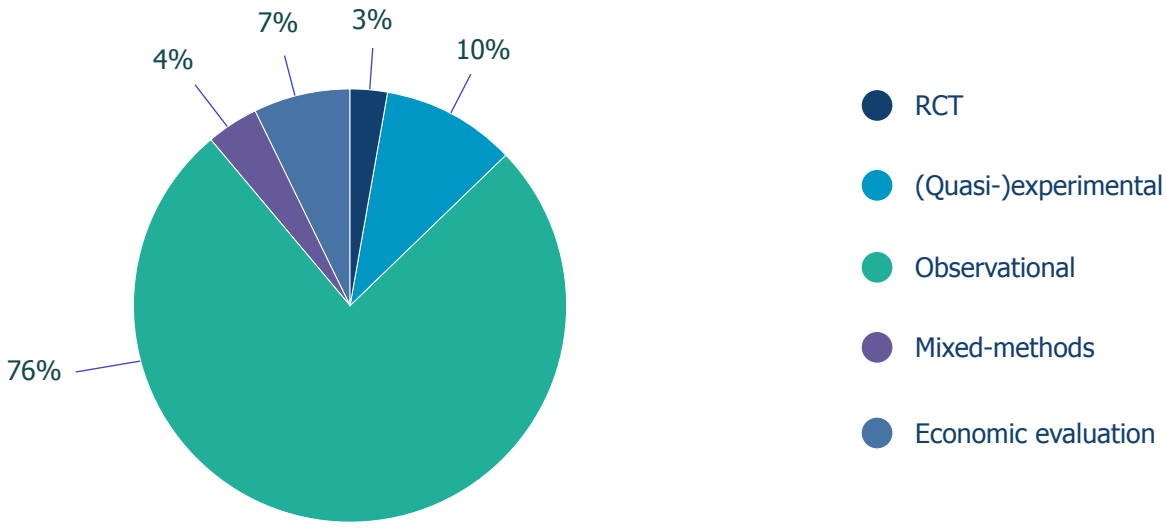
Study designs and research quality

Included articles were categorised by study design and risk of bias was assessed accordingly for each article. A summary of study design and quality appraisal findings follows.

Study designs

Quasi-experimental studies accounted for seven (10%) included publications, while observational studies accounted for 53 (76%). Economic evaluations accounted for five (7%), mixed-methods studies for three (5%) and randomised controlled trials (RCTs) two (3%) of the included articles (Figure 4.2). The sample size in the articles presented ranged from 24 (local government areas to evaluate impact of active case finding services)[18] to 3,317,304 (children targeted in a polio vaccination campaign).[19] Overall, there were 24 (34%) publications reporting sample sizes between 100 and 1,000 and 21 (30%) articles with a sample size greater than 1,000.

Figure 4.2 Communicable disease control research by type of study design

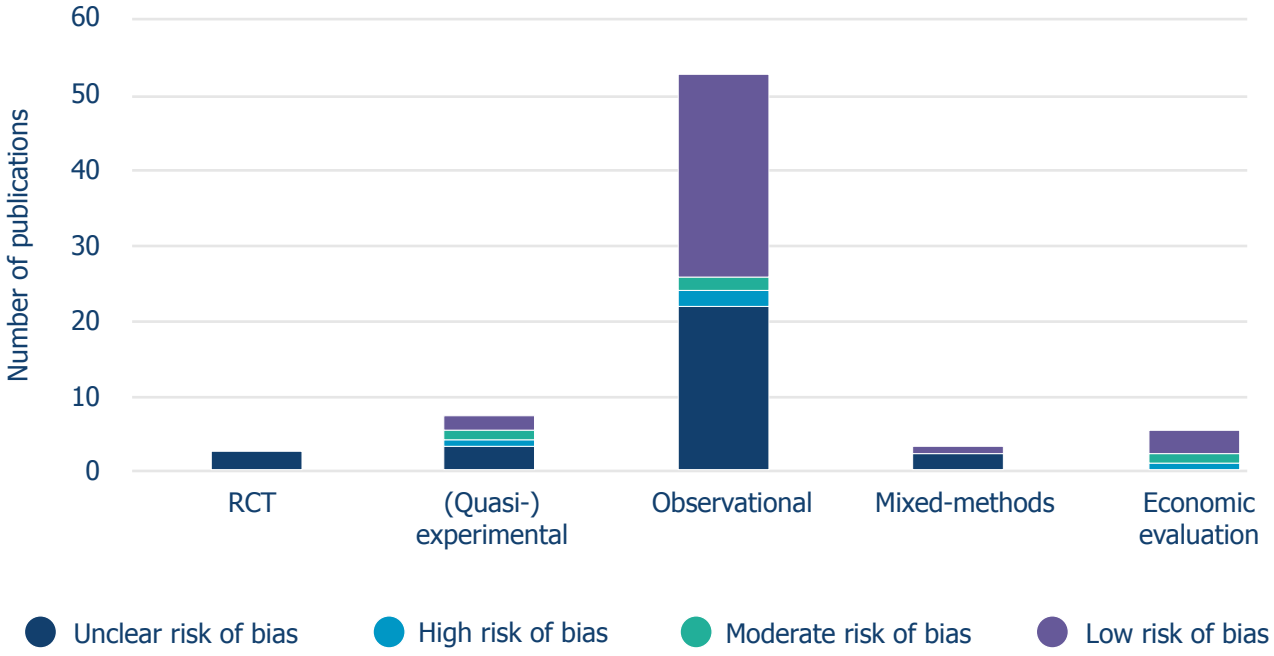


Quality appraisal

Of articles reporting on communicable disease control interventions, 41 (59%) included sufficient information to make a judgement on the risk of bias. Of these, 32 (78%) articles were judged to have a low risk of bias, five (12%) were assessed as having a moderate risk of bias and four (10%) a high risk of bias. The remaining 29 (41%) were determined to have an unclear risk of bias based on the information available in the article (Figure 4.3). Of the 53 observational studies, 27 (50%) were determined to have a low risk of bias, followed by 22 (40%) with an unclear risk, two (4%) with a moderate risk and two (4%) a high risk. Out of seven quasi-experimental studies, two had a low risk of bias, one a moderate risk, one a high risk of bias and three an unclear risk of bias. Both articles reporting on RCTs had an unclear risk of bias.* Of the three mixed-methods studies, two had an unclear risk of bias and one had a moderate risk. Lastly, of the five costing/economic evaluation studies, three had a low risk of bias, one a moderate risk and one a high.

*Per Cochrane guidance, to be classified as having a low risk of bias a study must be classified as having a low risk of bias in all domains. In many cases, articles were classified as having an unclear risk of bias because available information was insufficient to make classifications for one or more domains.

Figure 4.3 Risk of bias in communicable disease control publications, by study design

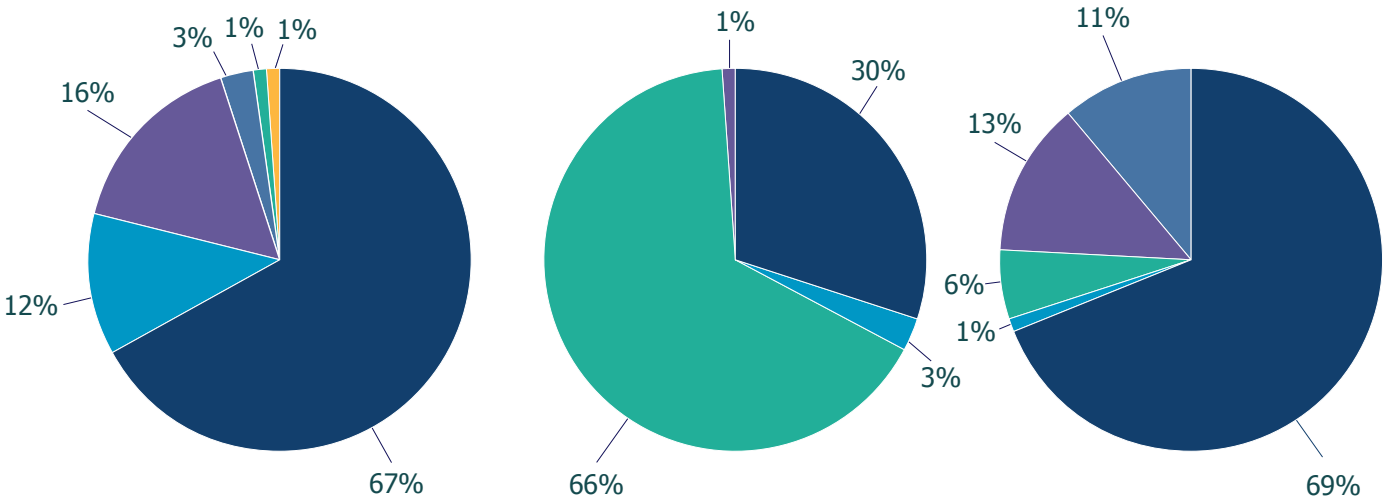


Research location, setting and population type

The majority (n=47, 67%) of communicable disease control articles reported on interventions in Africa (Figure 4.4). An additional 11 (16%) articles reported on interventions in Latin America and the Caribbean, eight (11%) reported on interventions in Asia and two (3%) in the Middle East. One (1%) reported on a targeted typhoid vaccination campaign following a cyclone in Oceania; and the remaining article reported on interventions implemented in study sites in multiple regions, household spraying programmes during cholera outbreaks in the Democratic Republic of the Congo (DRC) and Haiti. A map of countries in which communicable disease control research was conducted is provided in Annex 4. The majority of articles, 46 (66%), reported on interventions in areas where disease outbreaks were the primary cause of the crisis. An additional 21 (30%) articles reported on interventions in areas affected by armed conflict. Two (3%) articles reported on areas affected by environmental disasters, and one (1%) reported on an area affected by multiple types of crises (a study of wastewater disinfection in a region of Haiti affected by both an environmental disaster and disease outbreak).

The majority of articles, 48 (69%), reported on interventions for emergency-affected (non-displaced) individuals. An additional nine (13%) articles reported on interventions for refugee populations, four (6%) on interventions for IDPs and one (4%), a Phase III Ebola vaccine trial among frontline workers in Guinea, reported on interventions directed at host communities. Eight (11%) articles reported on interventions for multiple population types. The highest proportion of articles (n=25, 36%) reported on interventions in urban settings, with 19 (27%) reporting on interventions in mixed urban and rural settings and 16 (23%) on interventions in rural areas; urban or rural setting was not clear in ten (14%) articles. The majority of articles (n=47, 67%) reported on interventions occurring in non-camp settings, while 11 (16%) reported on interventions occurring in camp settings; and ten (14%) reported on interventions occurring in both camp and non-camp settings.

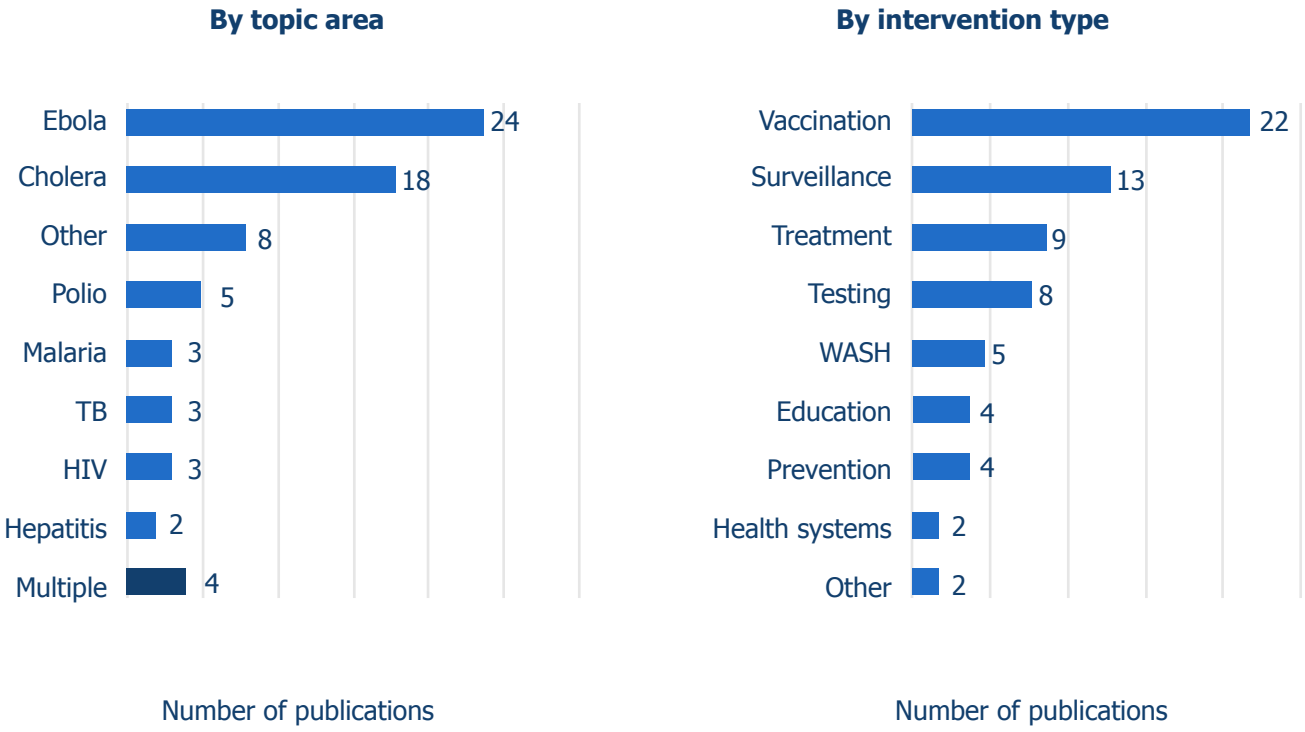
Figure 4.4 Distribution of communicable disease control publications by region, crisis and population



Topical areas and interventions of focus

An overview of the number of publications by topic area and intervention type is presented in Figure 4.5 and further discussed in this section. When considering the body of literature on communicable disease interventions that were large enough to be summarised by thematic area, four areas of focus with a sizeable number of publications were identified: Ebola, cholera, vaccination and surveillance. Figure 4.5 presents an overview of the distribution of topics and interventions across articles reporting on communicable disease control.

Figure 4.5 Communicable disease control research by topics and interventions of focus



Topical areas of focus

Articles that assessed Ebola interventions were the most frequent, accounting for 34% (n=24) of the communicable disease control articles;[20–43] cholera interventions were the second most frequent, accounting for 26% (n=18) of included articles.[44–61] Other communicable diseases with multiple publications included polio (n=5, 7%),[19,62–65] HIV,*[66–68] malaria,[69–71] and tuberculosis[72–74] interventions, which each had three publications that accounted for 4% of included articles. Many other communicable diseases, including diarrhoea,[75] measles,[76] yellow fever,[77] pneumonia,[78] scabies,[79] typhoid[80] and rotavirus[81] had only a single publication that accounted for 1% of included communicable disease control articles; several articles reported on multiple diseases. The small number of published studies on many important communicable diseases is a striking finding.

Interventions of focus

Included articles reported on the effectiveness of a wide range of interventions addressing various aspects of communicable disease control. Vaccination campaigns were the most frequent intervention of focus (n=22, 31%),[19,23,26,44,45,47,48,50,51,54,56,58,62,64,65,69,76–78,80,82,83] followed by surveillance/contact tracing (n=13, 19%);[18,22,27,29,30,37,40,63,73–75,84,85] disease treatment (n=9, 13%);[20,21,24,25,28,35,59,71,79] testing (n=8, 11%);[32,36,39,43,52,67,72,81] WASH (n=6, 9%);[53,55,57,60,61,86] education (n=5, 7%);[31,33,46,66,68] prevention (n=4, 6%);[34,49,70,87] health systems (n=2, 3%);[41,42] and surveillance/health education combined (n=1, 1%).[38]

*One article that evaluated models of care for chronic management of HIV is included in the Health Service Delivery review and omitted from Communicable Disease Control, as it does not address communicable aspects of HIV. An article by Logie et al. (2014) on HIV and sexually transmitted infection prevention intervention is elaborated in the SRH review, as well as Communicable Disease Control.

In terms of where interventions occurred, community-based interventions were reported most frequently (n=26, 37%), followed by facility-based interventions (n=22, 31%). An additional 11 articles (16%) reported on outcomes of combined interventions that took place both at community and facility levels. Fewer studies focused on communicable disease interventions at health system level (n=6, 9%) or laboratory level (n=2, 3%) and several did not specify the implementation location (n=2, 3%) or were not applicable (n=1, 1%).

With regard to implementation, information was summarised by the type of individual involved in intervention delivery. Articles reporting on interventions implemented by both health professionals and lay personnel were most common (n=28, 40%), followed by those carried out only by health personnel (n=15, 21%); an additional eight articles (11%) involved lay personnel only. A substantial number of publications either did not specify the personnel type (n=11, 16%) or the intervention did not require a specific type of personnel (n=8, 11%). Specific health professional cadres and lay personnel types involved in interventions also varied from topic to topic. Health professional cadres involved in interventions included doctors, epidemiologists, laboratory staff, nurses, state tuberculosis control officers, vaccinators, district health officers, district surveillance officers, community health officers, paramedics, research assistants, phlebotomists, nutritionists and health education teams. A range of lay personnel were also cited: community health workers, non-governmental organisation (NGO) staff, community volunteers, community leaders, camp managers, recorders, social mobilisers, data collectors, town announcers, spraying agents, refugee workers and call centre operators.

Considering the body of evidence on communicable diseases, four topic areas had a sizeable number of publications where the collective research during the review period could be thematically summarised. These included research on Ebola, cholera, vaccination and surveillance/contact tracing, all of which are presented in this section.

Ebola

As noted, 24 of the 70 (34%) articles reviewed reported on interventions related to Ebola.[20–43] Ebola studies were from Sierra Leone (n=11; 46%), Guinea (n=4; 24%), DRC (n=4; 24%) and Liberia (n=2; 8%). The remaining articles focused on a combination of the above countries. Ebola articles most frequently reported on treatment interventions (n=7, 29%),[20,21,24,25,28,35,41] testing (n=5, 21%),[32,36,39,42,43] and surveillance (n=6, 25%);[22,27,29,30,37,40] with fewer publications focused on infection prevention and control (n=2, 8%),[33,34] vaccination (n=2, 8%)[23,26] and community-based health education, including combined education and surveillance (n=2, 8%).[31,38] There was little consistency in the types of interventions seen in the body of evidence, making generalisations about the topic area challenging.

Ebola research most frequently focused on facility-based interventions (n=10, 42%), though a substantial number of studies were community-based (n=7, 30%). Other intervention locations included system-level interventions (n=4, 17%) and laboratory interventions to improve diagnostic capacity (n=2, 8%). One (4%) intervention was both facility-based and community-based. Fourteen (58%) of the Ebola interventions were part of a broader multi-sectoral programme, while ten (42%) were stand-alone interventions.

Ebola studies most frequently reported on interventions that involved only health professionals (n=9, 38%), though interventions involving both health professionals and lay personnel (n=7, 29%) were also frequent. Several articles reported using only lay personnel (n=2, 8%). The remaining six studies (25%) either did not specify personnel type (n=3, 13%) or the category was not applicable (n=3, 13%).

Ebola-focused articles were largely categorised as observational studies (n=20, 83%), though the body of evidence also included non-randomised quasi-experimental designs (n=2, 8%) and both a mixed-methods study and a costing study/economic evaluation. There was little consistency in outcome indicators reported across the literature, hindering the ability to meaningfully summarise evidence and draw inferences across studies. The most frequently reported outcomes included treatment (n=8, 33%), testing (n=5, 21%) and surveillance (n=6, 25%).

Treatment interventions. Four of the seven Ebola treatment articles examined malaria-related interventions and the remaining three articles each addressed a separate topic. One study evaluated the administration of convalescent whole blood in the treatment of Ebola virus disease in Sierra Leone and observed lower case fatality ratios among patients treated with convalescent whole blood compared to controls (26% vs 44%, p=0.09), as well as a significant decline in viral loads within 24 hours of convalescent whole blood treatment (p<0.001). The authors concluded that convalescent whole blood is promising for Ebola treatment in resource-poor settings and should be considered as a treatment option.[35] Another study examined the association between oral third-generation cephalosporin antibiotic treatment and mortality in a regional retrospective cohort. Patients who received once daily cefixime (400 mg) treatment for five days, per the clinical protocol, were compared to those not receiving the treatment due to lack of resource availability. Mortality was significantly lower among cefixime-treated patients compared to untreated patients (55% vs 73%); in advanced models, mortality likelihood was significantly lower among cefixime recipients (OR=0.5, CI: 0.3–0.7; p=0.01) and a non-significant risk reduction was found with cefixime treatment (RR=0.8, CI: 0.6–1.2, p=0.11). The study concluded that early oral cefixime may be associated with reduced Ebola mortality and warrants further investigation.[20] The last of the three studies examined the effect of opening a district-based Ebola management centre (EMC) on time to admission and number of suspect cases dead on arrival compared to the period before the facility opened when patients were referred to neighbouring districts for care. The median time from symptom onset to admission was longer in distant EMCs compared to the district EMC (6 vs 3 days, p<0.001); opening of a district EMC was associated with earlier admission to appropriate care facilities, illustrating the importance of rapidly scaling coverage of EMCs early in Ebola outbreaks.[41]

Four studies evaluated the impact of mass drug administration (MDA) with artesunate-amodiaquine (ASAQ), where amodiaquine has been shown to inhibit Ebola virus in laboratory settings. The first study used malaria morbidity at health facilities and the number of Ebola alerts received at district Ebola command centres as primary outcomes. After two rounds of the MDA, malaria cases decreased significantly by 45%; the proportion of confirmed malaria cases (out of all outpatients) fell by 33% while other non-malaria outpatient cases remained unchanged or fluctuated insignificantly. Ebola alerts decreased by 30% (13–46%) at the end of the first week and were lower in later weeks. The authors concluded that MDA reduced malaria transmission and morbidity along with the patient caseload in severely strained health services at the peak of the Ebola outbreak; and that MDA is an appropriate public health intervention in areas with high malaria transmission in the context of an outbreak.[21]

A second study examined MDA with ASAQ in Monrovia, Liberia, and observed that MDA may be effective in reducing cases of self-reported fever (decreases from 4.2% to 1.5%), but noted that treatment initiation was low. The authors concluded that MDAs should be combined with longer-term malaria prevention interventions and improved access to care.[28] The third study assessed the effect of MDA on mortality of patients at Ebola treatment centres in Sierra Leone. The overall patient mortality rate was 58% and patients exposed to ASAQ during the MDAs had a lower risk of death (RR=0.6, CI: 0.4–1.1, p=0.86); however, this finding was not statistically significant. The authors recommended additional trials to determine the effect of ASAQ on Ebola mortality.[25] The final study assessed the economic feasibility of preventive malaria treatment (artemisinin-based combination treatment) for contacts of Ebola patients to prevent febrile malaria and EMC admissions in Liberia, Sierra Leone, and Guinea. Preventive malaria treatment for contacts of Ebola patients was cost-saving among health provider contacts of all ages and was estimated to reduce the probability of admission by 10–36% depending on location and age group. The study concluded that preventive malaria treatment for contacts of Ebola patients should be considered when addressing Ebola outbreaks in locations/seasons of high malaria transmission.[24] The overall body of evidence on MDA with antimalarial drugs in Ebola outbreaks suggests the intervention is effective in reducing both malaria cases and admissions; and should be considered in future Ebola outbreaks to help manage health facility caseloads in areas with high rates of malaria transmission.

Surveillance. Six studies reported on Ebola surveillance or contact tracing. Two studies focused on phone-based surveillance systems at national and subnational levels. The evaluation of an Ebola national call centre and a local alerts system in Guinea observed sensitivity estimates (i.e. proportion of cases identified by calls) of 51.1% for local alert calls and 3.2% for the national call centre. The study concluded that prefecture-level reporting was more sensitive for case detection than the national call centre, which limited its utility as a surveillance system, and that the role of prefecture-level health departments in surveillance should be supported.[30] The other study evaluated the effectiveness of cell (mobile) phone messaging (SMS and calls) for community surveillance and compared this to sentinel surveillance in Sierra Leone, concluding that cell phone-based community surveillance outperformed the traditional sentinel surveillance system and that cell phone messaging is an effective tool for community surveillance.[27]

Two articles reported on facility-based surveillance, including passive and active surveillance, both of which used retrospective analysis. The first study used Ministry of Health active surveillance data to assess the accuracy of facility-based passive surveillance conducted prior to official active surveillance. Case reporting through the passive surveillance system coincided with official Ebola epidemic curves during outbreaks in 2007, 2008 and 2012. The authors concluded that passive surveillance based only on clinical evaluation may be a useful predictor of true cases prior to laboratory confirmation.[22] The second study described a facility-based active surveillance system that aimed to identify undetected Ebola cases among health facility patients. Fewer than 2% of patients met the definition of a suspected case; however, many who met the definition did not have Ebola. The authors concluded that the low positive predictive value of the Ebola suspected case definition is likely a reflection of the high infectious disease burden in the area (and comparatively low Ebola virus circulation) and that, given the burdensome nature of testing, improved clarity/protocols for selection of a subset of suspect cases would strengthen facility-based surveillance.[29]

Two of the surveillance articles, both from Sierra Leone, focused specifically on contact tracing, which aims to rapidly detect new cases and prevent further transmission. Both studies used retrospective descriptive analysis of data collected on confirmed Ebola cases and their contacts. There was convergence that contact tracing during the Sierra Leone outbreak was incomplete. One study that included >25,000 contact tracing records found case investigation was initiated in only 26.7% of cases and detected 3.6% of new cases.[40] A second, smaller study, which analysed >2,500 contact tracing records, found that 58% of cases had contact tracing initiated but only 44% had registered contacts and that 6% of cases were previously identified as contacts. Both studies concluded there were limitations to the performance of contact tracing and that there was considerable unmonitored transmission, particularly in earlier stages of the outbreak and in urban areas.

Testing. Of the five studies on Ebola testing, four focused on point-of-care testing approaches to address challenges associated with the use of reverse transcription-polymerase chain reaction (RT-PCR) for Ebola diagnosis, including two that examined alternatives to current testing practices (venous blood samples, RT-PCR) and two that assessed rapid diagnostic tests (RDTs).

The first of the two studies addressing alternatives to current Ebola testing practices evaluated usability of fingerstick capillary blood samples from patients in Guinea and observed the sensitivity and specificity of tests performed with capillary blood samples were 87% and 100%, respectively, compared to a venous sample gold standard. The study concluded that capillary blood samples could serve as an alternative to venous samples for Ebola diagnosis in resource-limited settings, which could help to overcome human resource and logistical limitations of venous blood samples and aid in testing among populations where venous sample collection is particularly challenging.[39] The second study evaluated performance of the Cepheid GeneXpert Ebola assay on venipuncture blood samples and buccal saliva swab specimens, comparing findings to RT-PCR testing. All positive RT-PCR samples were Xpert positive, translating to 100% sensitivity and specificity was also 100%. The authors concluded the Xpert Ebola assay had excellent performance compared to the RT-PCR gold standard in a laboratory; and that feasibility and performance in other settings should be evaluated as an approach to facilitate expanded access to testing.[36]

Of the two studies focusing on RDTs, the first evaluated the diagnostic accuracy of a rapid diagnostic antigen test developed by the United Kingdom's Defence Science and Technology Laboratory against RT-PCR in Sierra Leone. All RT-PCR confirmed Ebola cases were identified by the antigen RDT, with sensitivity of 100%, specificity of 97%, and positive and negative predictive values of 79% and 100%, respectively. The authors concluded that the results, if confirmed in a larger study, indicate that the RDT could be used to improve rapid identification of Ebola cases and resource allocation in outbreak response.[43] The second RDT study evaluated the immunochromatography-based QuickNaviTM-Ebola Kit in the DRC using the World Health Organization-approved GeneXpert RT-PCR test as a gold standard. The sensitivity and specificity of QuickNaviTM-Ebola were estimated at 85% and 100%, respectively, which the authors concluded is indicative of practical reliability for point-of-care Ebola diagnosis.[32]

The remaining study on Ebola testing used laboratory testing to evaluate triage performance among admitted patients in Sierra Leone. The positive and negative predictive values for receiving a positive laboratory result after being allocated to the 'highly-suspect' ward were 76% and 54%, respectively; sensitivity and specificity were 70% and 61%, respectively. These findings suggest inaccuracies in patient classification and testing, and that point-of-care diagnostic testing could improve early isolation and management of patients with Ebola.[42]

Cholera

Of the included 70 publications on communicable diseases, 18 (26%) articles focused on interventions related to cholera.[44–61] The majority of cholera publications were from Latin America and the Caribbean (n=11, 61%), with fewer numbers from Africa (n=6, 33%) and Asia (n=1, 6%). Most cholera-focused interventions were community-based (n=9, 47%), though four (21%) were facility-based, four (21%) were a combination of facility- and community-based, and two interventions had unclassified implementation locations. Both health professionals and lay personnel were involved in ten of 18 (56%) cholera interventions; and two (12%) interventions involved lay personnel only. The remaining publications either did not specify (n=3, 16%) or this type of categorisation was not applicable (n=3, 16%). Of the 18 cholera publications, ten (56%) reported on interventions that were part of a broader multisector programme, while eight (42%) focused on stand-alone interventions.

Research on cholera vaccination was most common, accounting for 12 (66%) publications, followed by three (17%) articles on WASH interventions intended to reduce cholera transmission; two (11%) on testing, including water testing and an RDT for cholera diagnosis; and one article that focused on cholera treatment. Of note, nine (50%) cholera publications originated from Haiti and many focused on a single national programme, which is not typical of humanitarian settings and an important consideration when assessing the evidence base. Given the concentration of cholera vaccine research, key findings are summarised in Figure 4.6. Six cholera vaccination studies reported on vaccination coverage (range: 69–99%)[44,46,51,54,57,88] and six studies reported on vaccine effectiveness (range: 58–98%; most often concerning symptomatic illness during follow-up periods of variable lengths).[44,45,47,48,50,58] The remaining study was a costing evaluation that estimated the total cost per dose at US$2.90, including US$1.85 for the vaccine, US$0.70 for delivery and administration, and US$0.35 for transportation and storage.[56]

Figure 4.6 Summary of oral cholera vaccination evidence from humanitarian settings (2013–2021)

Study	Location	Vaccination coverage	Vaccine effectiveness
Aibana (2013)[46]	Haiti	OCV1 93% (reported) OCV1 81% (card-confirmed)	Specific to Amani 2021; the other articles Aibana through Scobie do not have vaccine effectiveness evidence. Trend in reduction of new cases after OCV campaign
Amani (2021)[44]	Cameroon	OCV1 100% (reported) OCV1 97% (monitoring)	
Khan (2019)[82]	Bangladesh	OCV1 94%, OCV2 92%	
Luquero (2013)[51]	Guinea	OCV1 89%, OCV2 76%	
Parker (2017)[54]	S. Sudan	OCV 1 69%	
Scobie (2016)[57]	Thailand	OCV1 91%, OCV2 85%	
Azman (2016)[45]	S. Sudan		Azman 2016: 80% unadjusted, 87% adjusted Bekolo 2016: OCV2 patients were significantly less likely to develop severe disease compared to unvaccinated patients (adjusted oddrs ratio 0.2, p<0.01)
Bekolo (2016)[47]	S. Sudan		
Franke (2018)[48]	Haiti		76%
Ivers (2015)[50]	Haiti		58%
Severe (2016)[58]	Haiti		98%

Note: OCV = oral cholera vaccination

Vaccination campaigns

Vaccination campaigns represented 22 of the 70 (29%) communicable disease control articles.[19,23,26,44,45,47,48,50,51,54,56,58,62,64,65,69,76–78,80,82,83] Of the publications on vaccinations, 11 (50%) focused on cholera; four (18%) on polio; two (9%) on Ebola; two (9%) on multiple diseases (cholera, polio, measles and rubella in one and pentavalent vaccine coverage in the other); and one (4%) each on malaria, measles, pneumonia, typhoid and yellow fever. The majority of the vaccination literature (n=15, 68%) described vaccination interventions in Africa, with fewer publications from Latin America and the Caribbean (n=4, 18%), Asia (n=3, 14%) and Oceania (n=1, 5%). As with most communicable disease control research, vaccination studies were largely observational, likely due to the complexity of and ethical issues with conducting a randomised trial in an acute outbreak situation: 19 (86%) were observational studies, two (9%) were costing studies, one (5%) was a randomised trial and one (5%) was a quasi-experimental study.

There was substantial variation in the sample size of vaccination campaign studies, with sample sizes from observational studies ranging from 189 individuals involved in a polio vaccination campaign in Somalia to 537,274 individuals participating in a cholera vaccination campaign in Cameroon. Of the 22 vaccination campaign articles, over half (n=13; 59%) focused on emergency-affected (non-displaced) individuals, three (14%) on refugee populations, one (5%) on host communities, four (18%) on multiple populations and one (5%) on IDPs.

Of the 22 vaccine-related interventions, the two most common outcome measures were vaccine coverage rates (n=10, 46%) and vaccine effectiveness (n=10, 46%). Coverage and effectiveness estimates for the various studies can be found in Annex 5 and are not summarised in the text (with the exception of oral cholera vaccines) because of the varied nature of the vaccines and diseases they are intended to prevent. Vaccination campaigns, while varying greatly in context and methods, had a common theme in that they demonstrated feasibility in multiple contexts, including those of urban, rural, post-disaster, camp and non-camp settings.

Surveillance

Surveillance comprised 13 (19%) out of the 70 articles reviewed under the communicable disease control topic area.[18,22,27,29,30,37,40,63,73–75,84,85] The vast majority of articles, 12 out of 13 (92%), used an observational study design while one (8%) used a mixed-methods design. Of the 13 articles, ten (80%) originated from Africa, with the other two focused on Asia and the Middle East. Surveillance articles most often focused on Ebola (n=6, 50%), with fewer numbers on tuberculosis (n=2, 17%) and other conditions (one publication each on diarrhoea, polio, cholera, HIV/tuberculosis combined and multiple outbreak-prone diseases (OPDs)). Populations in the majority of surveillance articles (n=9, 69%) were emergency-affected (non-displaced); three (23%) articles focused on refugees and one (8%) on multiple population types. Four (31%) surveillance articles reported on national-level surveillance systems, whereas the remaining nine (69%) reported at regional level.

Four articles focused on a combination of surveillance and other interventions including both contact tracing and treatment (n=2, 15%), contact tracing and testing (n=1, 8%) and a combined surveillance/WASH intervention (n=1, 8%). Community-based interventions accounted for six (46%) of the surveillance articles, five (38%) were conducted at health system level and the remaining two (15%) were facility-based. The personnel involved in surveillance interventions varied and were distributed in the following categories: health professionals (n=3; 23%), lay personnel (n=3; 23%) and a combination of lay personnel and health professionals (n=4; 31%). Findings from surveillance articles are summarised in Annex 5 but were not synthesised due to the variation in diseases and reporting formats, which precludes broader synthesis. Furthermore, findings describe disease prevalence/incidence but do not reflect the impact of specific communicable disease control interventions, which is the focus of this review.*

* Surveillance was defined as intervention for the purposes of the review (meaning articles met inclusion criteria) but observed changes in disease measures could not be attributed to the intervention.

Cumulative summary of recent communicable disease publications

In this section, the body of evidence on communicable diseases during the eight-year HHER2 review period is compared against the body of evidence captured in HHER1[2] (Figure 4.7) as means of summarising the cumulative evidence base on various topics within the broader category of communicable diseases.

Figure 4.7 Comparison of communicable disease control research across evidence reviews

Study design and quality	HHER1 (1980–2013) 131 articles	HHER2 (2013–2021) 70 articles
Study design		
Experimental	**59**	2
Quasi-experimental	10	6
Observational	56	**54**
Mixed-methods	-	3
Economic evaluation	5	5
Study quality		
Low risk of bias	Comparable quality assessment not completed in HHER1.	**30**
Moderate risk of bias		6
High risk of bias		4
Unclear risk of bias		30
Study characteristics		
Region		
Africa	49	**47**
Asia	**76**	8
Latin America/Caribbean	3	11
Middle East	3	2
Others	-	2
Crisis type		
Armed conflict	**118**	21
Environmental disaster	13	2

Outbreak	-	**46**
Multiple	-	1
Population type		
Refugee	**76**	9
Internally displaced	14	5
General population	41	**49**
Multiple	-	7
Study topics and interventions		
Topic area		
Malaria	**62**	3
Tuberculosis	25	4
Measles	17	1
Cholera	6	19
Polio	6	5
Diphtheria/tetanus/pertussis	6	-
Diarrhoea	4	1
Ebola	-	**24**
Multiple OPDs	-	3
HIV	-	3
Visceral leishmaniasis	5	-
Other	-	7
Intervention type		
Vaccination	nearly 20%	**23**
Surveillance	-	13
Treatment	**111**	9
Testing	-	8
Prevention	33	4
Education	-	4
Other	-	9

Changes in research between the review periods

HHER1 identified 131 communicable disease articles across 32 years (1980–2013), including 36 published between 2005 and 2013. In comparison, HHER2 found a little over half (53%) as many articles in a third of that time, and a noticeable increase in the quantity of publications from 2015 onwards (63 publications, a substantial increase in the number of publications as compared to any preceding time period). This trend suggests either increased attention to communicable diseases in humanitarian settings or a greater willingness and capacity to publish findings. The rise in publications may also be due in part to the response to the West Africa Ebola regional epidemic, which accounted for many publications in this time frame. Considering that HHER2 was conducted while the COVID-19 pandemic was ongoing, it is anticipated that there will be another increase in the number of publications on communicable diseases in humanitarian settings as COVID-19 studies are published over the next several years.

Most articles in HHER1 reported on interventions in Asia (58%) or Africa (37%), which is where the largest humanitarian crises are presently concentrated. Interestingly, the publication location trends differed and there was a noticeable decrease in communicable disease publications in Asia (11%) and a shift of focus to Africa, which accounted for 67% of the publications in HHER2. The proportion of articles from Latin America and the Caribbean increased from 2% to 16% of articles between HHER1 and HHER2. However, all 11 articles in HHER2 detailing interventions in Latin America and the Caribbean region took place in Haiti, all but one of which focused on cholera. Cholera interventions only accounted for 5% of the articles in HHER1 compared to 27% in HHER2.

The vast majority of articles in HHER1 focused on interventions in areas affected by armed conflict, most often in refugee populations. The focus shifted to outbreaks, notably Ebola and cholera in HHER2, with more evidence from general populations (e.g. emergency-affected but non-displaced) or from multiple population types. Literature from HHER2 focused on a broad range of interventions, whereas most publications (85%) in HHER1 reported on communicable disease treatment, with malaria, tuberculosis and measles the most common diseases of focus.

Also noteworthy was the observed change in research designs between the HHER1 and HHER2. More than half of articles in HHER1 reported on findings from experimental (n=59, 45%) or quasi-experimental (n=10, 8%) research designs, whereas HHER2 found mainly observational studies (n=54, 77%) and comparatively few experimental (n=2, 2%) and quasi-experimental studies (n=6, 5%). The change in study design is likely a result of the shift of focus in the evidence base away from treatment interventions and towards outbreak response, where observational studies are more feasible to implement due to challenges associated with setting up and conducting a randomised or quasi-experimental design that coincides with onset of an outbreak. Comparison of the quality of evidence generated in the two time periods was not possible. However, it was noteworthy that of the articles included in HHER2, similar numbers either included insufficient information for quality appraisal or were classified as having a low risk of bias (60%).

Most articles in HHER1 assessed interventions focused on malaria, tuberculosis and measles. There was a major shift in HHER2 to focus on Ebola and cholera, with a much smaller focus on malaria, tuberculosis and measles. Most articles in HHER1 assessed treatment interventions of varying kinds, with prevention and vaccination representing the rest of the articles. The most frequent intervention type in HHER2 shifted to vaccination interventions, and HHER2 also saw a diversification

of intervention type with surveillance, testing, education, contact tracing, health systems and WASH represented.

Communicable disease control evidence gaps

HHER1 reported on several gaps in the evidence base and identified a lack of research on quality standards and indicators to measure impact of communicable disease control interventions (e.g. standardised measurement methods for outcomes such as mortality). HHER1 noted specific evidence gaps around several diseases including polio, measles, hepatitis A and E, and pertussis; the need for research in urban settings was also noted as an evidence gap. HHER2 identified a sizable number of interventions in urban settings (36% of publications), as well as numerous coordinated interventions such as combining mid-upper arm circumference (MUAC) screening or education with vaccination campaigns or multisector cholera prevention programmes. However, research focusing specifically on broader coordination of communicable disease control efforts and related outcomes was absent.

Since HHER1, another systematic review on infectious diseases in conflict settings was conducted that covered a partially overlapping period (1990-2018) and identified 194 publications, most of which were from Africa (55%), Asia (27%), and the Middle East and North Africa (15%). The most frequently reported areas of focus were vaccination campaigns and malaria interventions. Gaps identified in the literature included: (1) few publications from Latin America and the Caribbean (consistent with HHER1); (2) an absence of publications on infectious disease interventions targeting adolescents; and (3) a disproportionate amount of literature focusing on measles and polio, while ignoring other infectious conditions that occur in the context of conflict.[89]

With respect to literature gaps identified in the infectious diseases in conflict review, 16% of publications in HHER2 were from Latin America and Caribbean, all of which originated in Haiti, representing an increase from HHER1. The relatively small proportion of studies from this region may reflect the greater proportion of people affected by humanitarian crises in Africa and Asia, and the smaller proportion of displacement in the region prior to mass displacement from Venezuela beginning in 2017. HHER2 did not specifically examine interventions targeting adolescents but, given that adolescents are often included in studies reflecting the general population (though not consistently disaggregated as such), it could not be determined whether this remains a critical evidence gap.

Finally, compared to literature included in HHER1 and the recent review of infectious disease interventions for women and children in conflict settings, in HHER2 there was a noticeable decrease in research on malaria (62 vs 3 publications), measles (17 vs 1 publication) and tuberculosis (25 vs 4 publications), while polio publications remained similar in number (6 vs 5 publications). An increase in the number of publications from HHER1 to HHER2 occurred for several communicable diseases, notably cholera (6 vs 19 publications) and Ebola (0 vs 24 publications). This may reflect changes in the need for different research topics and/or shifts in donor funding priorities in humanitarian settings. The rate of evidence generation for communicable diseases in lower- and middle-income settings, evidence gaps within these contexts; and both if and how various types of evidence are or could be translated for use in humanitarian settings are also unclear from this review. For many communicable diseases, in particular epidemic-prone diseases and vaccine trials, it is apparent there is a large evidence base from lower- and middle-income settings that is beyond the scope of this review but that is likely be highly relevant to humanitarian contexts.

Recommendations for future communicable disease control research

Despite the recent proliferation in communicable disease publications in humanitarian settings, there is no doubt that gaps in the evidence base remain given the diversity of communicable diseases, affected populations, humanitarian settings and disease control interventions. Evidence gaps and recommendations for future research include the following:

- Malaria, tuberculosis and measles were the most researched communicable diseases in HHER1, Ebola and cholera were the most common in HHER2, and ongoing research at the time of writing (not included in this review) reflects an emerging focus on COVID-19. **Future communicable disease control research should prioritise diseases with a high morbidity and mortality burden, or where there is failure to achieve disease control despite existing evidence.**

- Communicable disease treatment and testing interventions comprised only 14% and 11% of publications, respectively – a relatively small proportion given their importance in infectious disease control. **Future research should prioritise interventions with potential to increase access and ease of diagnostic testing and treatment interventions that have been demonstrated to be effective in other contexts but for which there is a lack of evidence in humanitarian settings.**

- Vaccination was the most frequently reported communicable disease intervention, with many studies reporting vaccination coverage rates, which are generally high. **Future research on vaccination should focus on vaccines with a more limited evidence base and should report outcome measures beyond coverage rates.**

- With respect to geographic areas of focus, communicable disease control research should remain proportionate to the regions most affected by infectious diseases and with the largest number of people affected by crises. Given urbanisation and the long-standing preference for settlement outside of camps, future research should be diverse in context to acknowledge both the predominance of urban displacement and the infectious disease risks and vulnerabilities associated with camp settings.

- Research on specific communicable diseases should be informed by a broader review of evidence that includes non-crisis-affected lower- and middle-income settings because much evidence from these contexts is likely to be relevant in humanitarian crises. This is particularly true for epidemic-prone diseases where a significant amount of relevant literature may have been excluded from this review as they did not occur within the context of a humanitarian crisis.

- Low-quality evidence was noted as a limitation to communicable disease control research in all recent reviews. In this review, only 59% of articles included sufficient information for quality appraisal and 46% of studies were classified as having a low risk of bias. **Ensuring sound study design and a complete description of study methods to enable quality appraisal in communicable disease research is necessary for future research to be impactful.**

5

Water, Sanitation and Hygiene

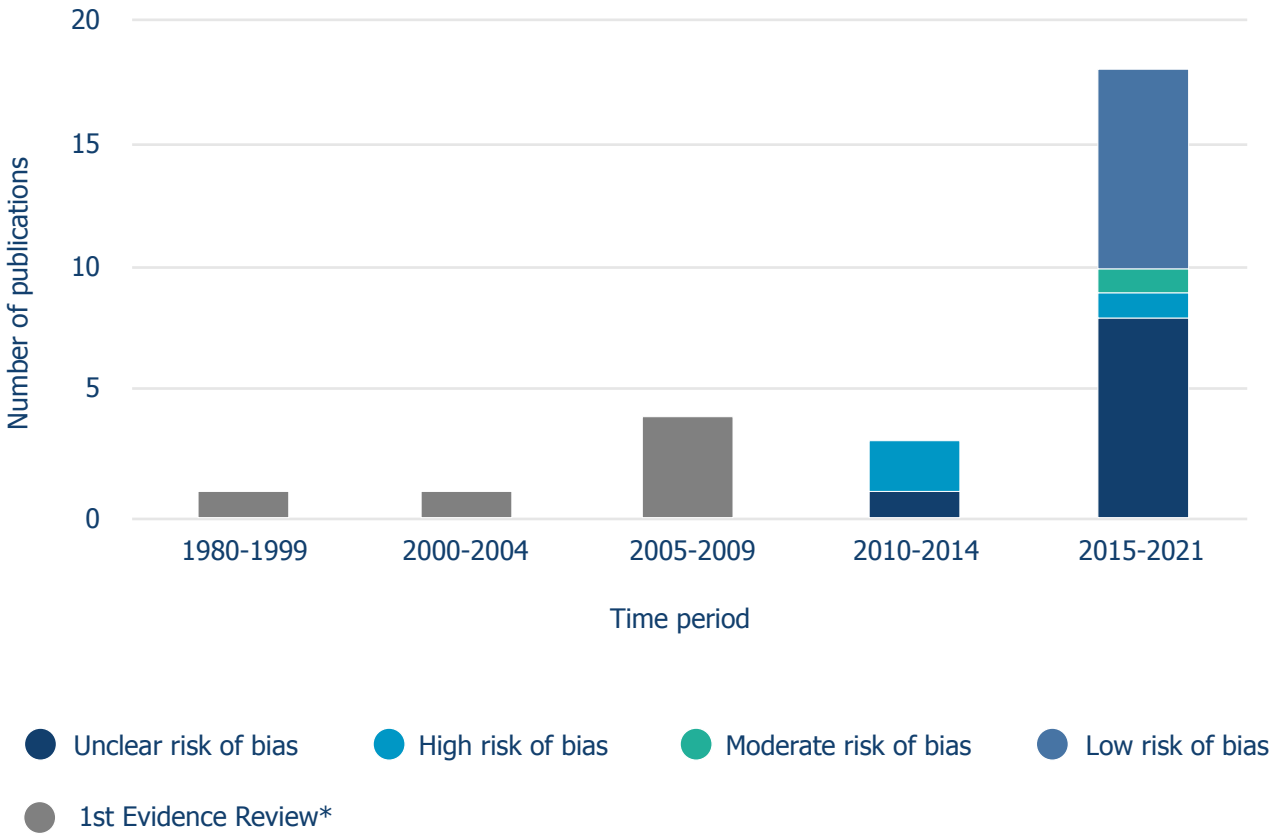
5. WATER, SANITATION AND HYGIENE

21 Peer-reviewed publications in 8 years

Overview of literature search findings

Of 269 peer-reviewed articles meeting eligibility criteria across all topic areas, 21 (8%) reported on WASH. The 21 peer-reviewed articles presented findings from 20 unique studies; a detailed summary of included WASH studies is presented in Annex 6. Of these 21 articles, three were published in 2013–2014, seven in 2015–2017 and 11 in 2018–2021. The number of WASH articles published in the past eight years is triple the number included in HHER1 (n=6), which spanned a 32-year period from 1980 to mid-2013. HHER1 and HHER2, respectively, averaged 0.2 and 2.6 WASH publications annually, indicating a dramatic increase in the volume of WASH research. Given the recency of this trend, with a large increase in publications since 2015, the overall evidence base for WASH interventions in humanitarian settings remains limited. Changes in the volume of publications are illustrated in Figure 5.1.

Figure 5.1 Quantity and quality of WASH publications over time



*Non-comparable quality appraisal was conducted in HHER1 (1980-2013).

Study designs and research quality

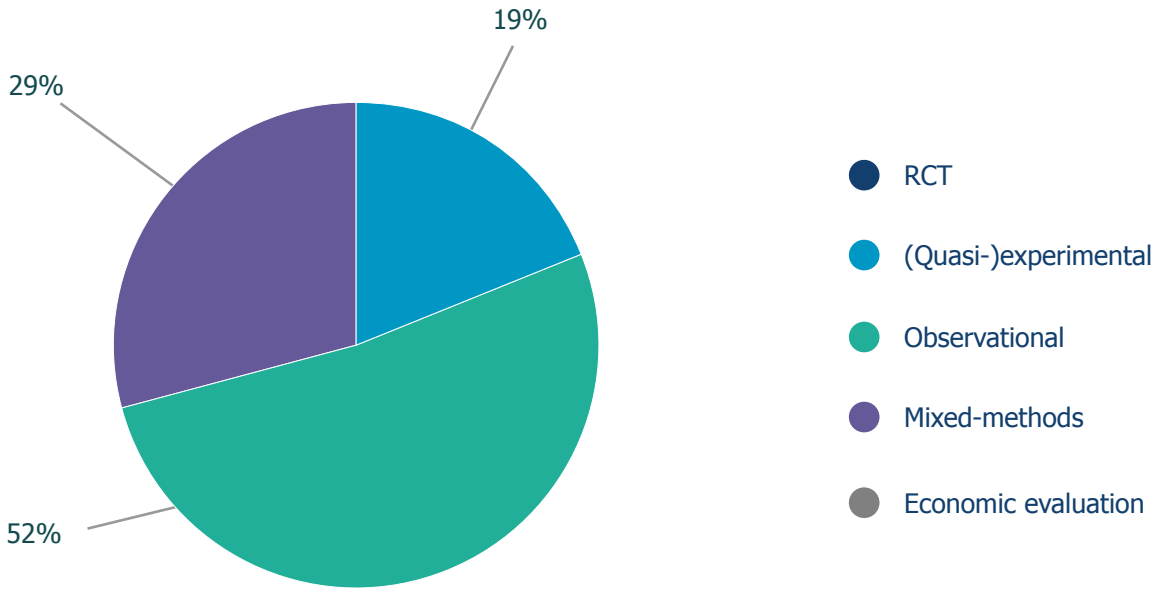
Included articles were categorised by study design and risk of bias was assessed accordingly for each article. A summary of study design and quality appraisal findings follows.

Study designs

The most common study design was observational, accounting for 11 (52%) articles including three longitudinal studies and two retrospective studies. Another six (29%) articles reported on mixed-methods studies, including one that also incorporated economic assessment of interventions. Single-group pre-post evaluations were conducted in two mixed-methods and two observational studies. Four (19%) studies employed quasi-experimental designs (Figure 5.2).

While not all WASH articles reported a sample size, in those that did, reported sample sizes ranged from 14 (households surveyed to evaluate a household spraying intervention)[49] to 7,856 (cholera surveillance alerts analysed to evaluate the implementation of case-area targeted interventions (CATIs)).[55] In three (14%) articles, the sample size was greater than 1,000 and an additional nine (43%) articles reported on studies with a sample size greater than 100. Sample size was not explicitly reported in 4 (19%) articles.

Figure 5.2 WASH research by type of study design

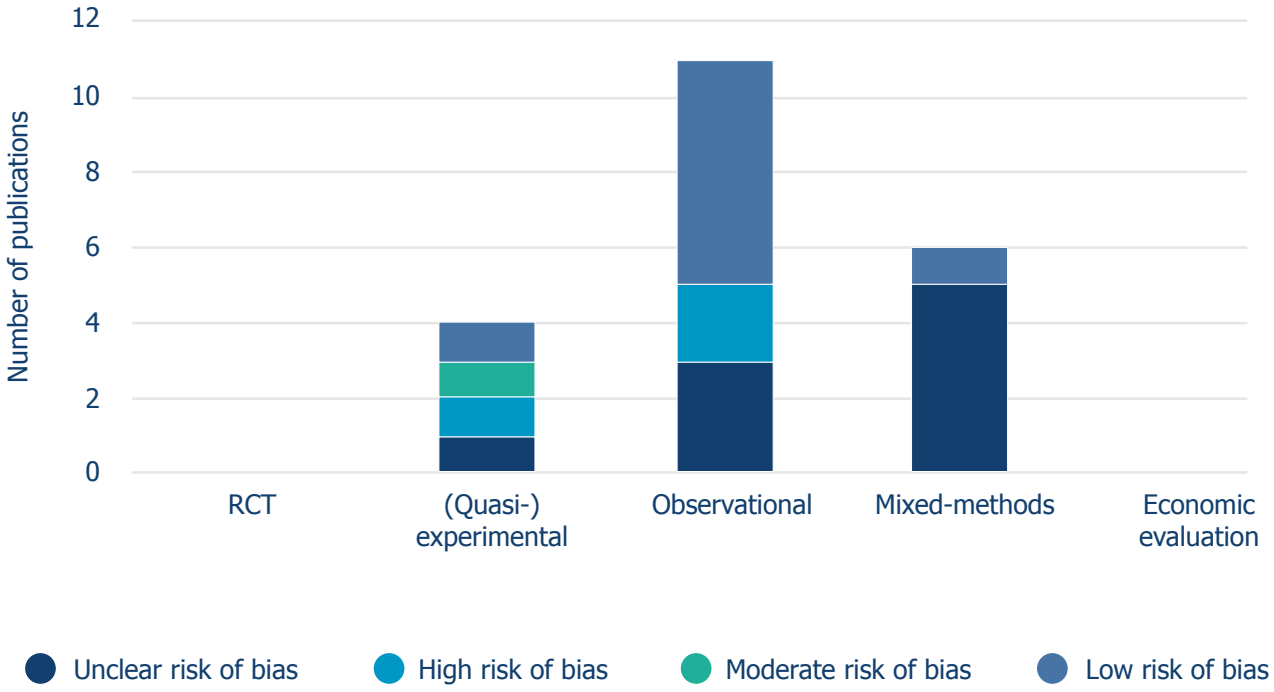


Quality appraisal

Among the 21 articles reporting on WASH interventions, 12 (57%) included sufficient information to make a judgement on risk of bias (Figure 5.3). Based on their study designs, eight (38%) articles were judged to have a low risk of bias, one (5%) a moderate risk and three (14%) a high risk. The remaining nine (43%) articles were determined to have an unclear risk of bias based on the information available in the article and the requirement for complete reporting across multiple quality appraisal categories to make a final determination.

Of the 11 articles reporting on observational studies, six (55%) had a low risk of bias, two (18%) a high risk and three (27%) an unclear risk. Mixed-methods studies represented the highest proportion of studies with an unclear risk of bias (n=5, 83%) and observational studies represented the highest proportion of studies with a low risk (n=6, 55%). The four articles reporting on quasi-experimental studies were evenly distributed across risk of bias categories.

Figure 5.3 Risk of bias in WASH publications, by study design

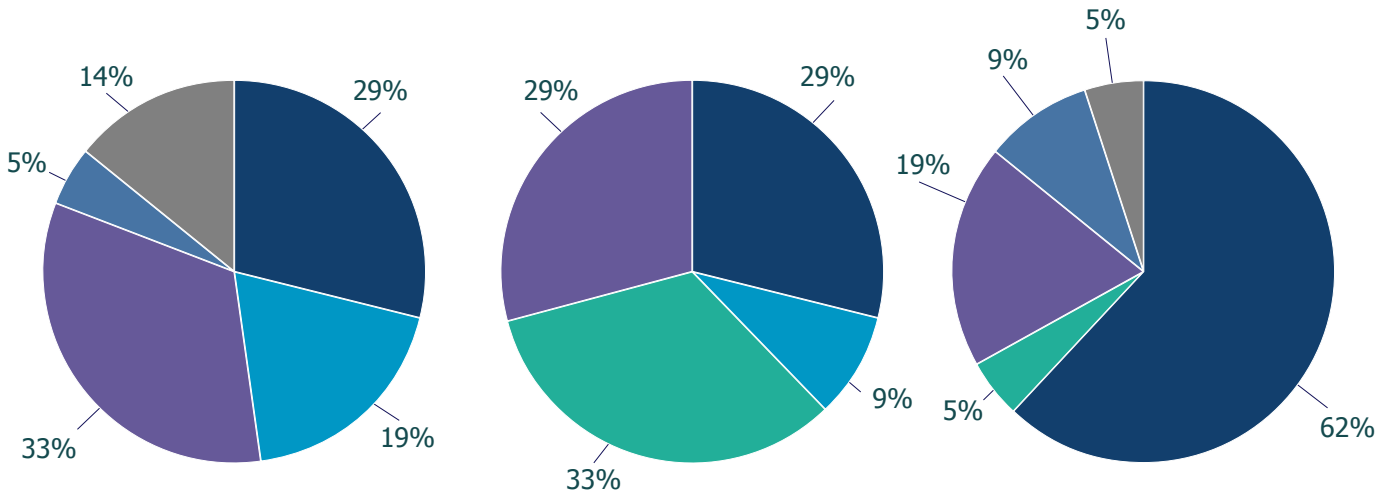


Research location, setting and population type

The distribution of humanitarian WASH research by region, setting and population is presented in Figure 5.4; a map of countries in which WASH research was conducted is provided in Annex 4. The largest proportion of WASH articles reported on interventions in Latin America and the Caribbean, accounting for seven (33%) articles, though all of these studies were in Haiti. It is worth noting that almost half of all WASH articles (n=9, 43%) reported on interventions in Haiti; this includes seven studies from Haiti alone and two multi-country studies where Haiti was represented.[46,49,53,60,61,90–92] A smaller number of articles (n=6, 29%) reported on interventions in Africa, including one multi-country study, with publications from Angola, Chad, Ethiopia, Liberia and Sierra Leone. Asia accounted for four (19%) studies implemented in Bangladesh, Pakistan and Thailand, while one (5%) article reported on an intervention in Iraq. The remaining three (14%) articles reported on studies in multiple regions including Africa and Asia (n=1; DRC and Bangladesh), as well as Africa and Latin America and the Caribbean (n=2; DRC, Senegal, Sierra Leone and Haiti).

A breakdown of articles by crisis type shows that the largest portion of articles (n=7, 33%), reported on interventions in areas affected by a disease outbreak, followed closely by armed conflict (n=6, 29%). Of the remaining articles, two (10%) reported on interventions in environmental disaster contexts and six (29%) reported on interventions occurring in areas affected by multiple types of crises. Most WASH articles classified the study site as either rural, urban, or both; however, urban vs rural location was not specified in three (14%) articles. A similar number of articles reported on interventions in both urban and rural areas (n=6, 29%) and in rural areas (n=7, 33%) with the remaining five (24%) articles on interventions in urban areas. The majority of articles (n=13, 62%) reported on interventions occurring in non-camp settings compared to only five (24%) in camp settings and two (10%) in both camp and non-camp settings. The remaining WASH article did not fully specify location. WASH articles most commonly reported on interventions in emergency-affected (non-displaced) populations (n=13, 62%), followed by refugees (n=4, 19%) and IDPs (n=1, 5%). Of the remaining articles, two (10%) examined interventions for multiple populations and one did not specify population type.

Figure 5.4 Distribution of WASH publications by region, crisis and population

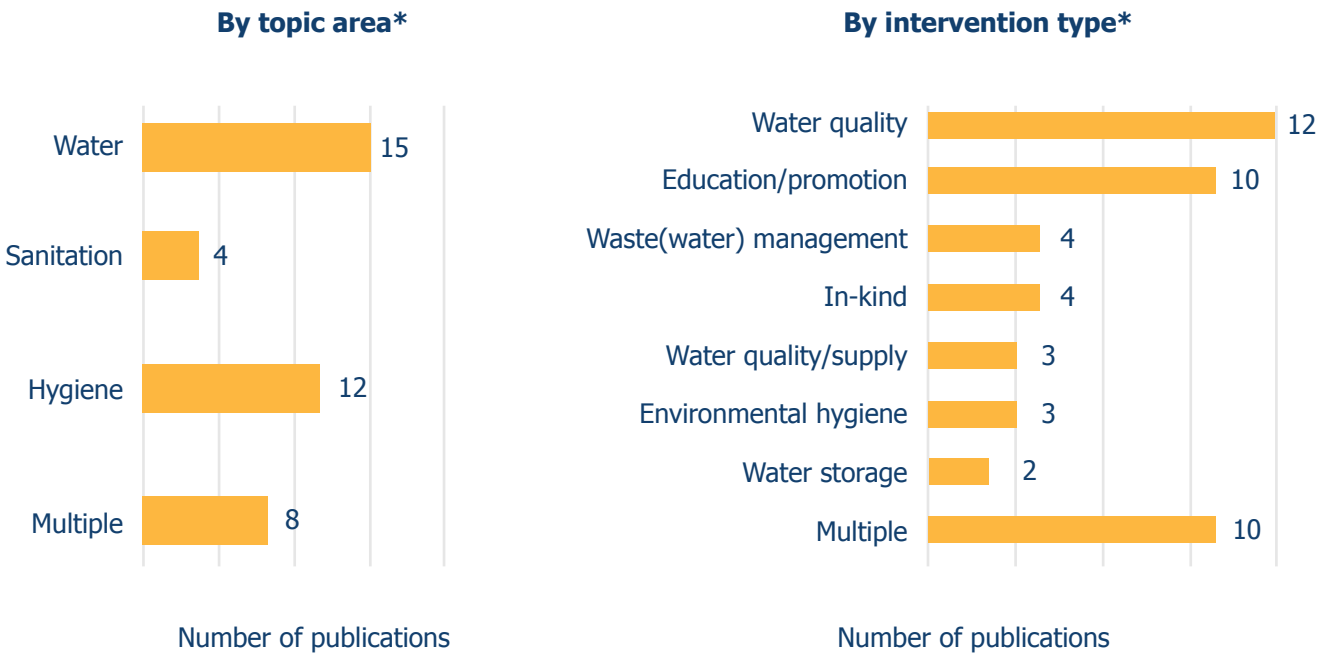


Topical areas and interventions of focus

Topical areas of focus

To characterise identified WASH publications, article themes were summarised into three topical areas of focus: water, sanitation and hygiene. Articles were also further categorised based on the type(s) of intervention(s) on which they reported, aligning with intervention categories used in HHER1 to the extent possible to allow comparison of evidence in both reviews and change over time (Figure 5.5).

Figure 5.5 WASH research by topics and interventions of focus



*Categories not mutually exclusive

A summary of the evidence base for WASH is provided in this section and results from each of the studies are presented in Annex 6. Findings across each topic area were not synthesised in the report because both interventions of focus and outcome measures varied such that results could not be meaningfully aggregated. Additionally, eight (38%) articles covered two or more of the three overarching topic areas.[46,53,55,86,93–96]

Water

Most articles reported on water-related interventions, accounting for 15 (71%) WASH articles.[46,53,55,61,86,90–99] Articles covering water-related interventions focused on water supply, treatment, purification and filtration, storage and water-related education. The largest proportion of articles on water-related interventions, accounting for seven (47%), reported on interventions in Haiti; this was followed by seven African countries that accounted for six (40%) studies on water.

Of the 15 WASH articles reporting on water-related interventions, most (n=12, 80%) reported on interventions in non-camp settings and were conducted in rural settings (n=12, 80%). Interventions among emergency-affected (non-displaced) populations accounted for ten (67%) of the 15 water studies, with refugees being the next most frequent population of study (n=2, 13%).

Hygiene

Hygiene interventions were reported in 12 (57%) articles that examined hygiene education and promotion, in-kind assistance (e.g. soap, hygiene kits) and menstrual hygiene interventions.[34,46,49,53,55,57,86,93–95,100,101] Hygiene research was concentrated in Africa, accounting for five (42%) studies, followed by Haiti, which accounted for four (33%) publications. More than half (n=7, 58%) of hygiene-related intervention studies were conducted in non-camp settings. WASH articles on hygiene-related interventions were also more heavily focused in rural than urban settings, with eight (67%) hygiene-related articles originating from rural areas. Research on hygiene interventions was predominantly conducted among emergency-affected (non-displaced) populations (n=8, 67%), followed by refugee populations (n=3, 25%).

Sanitation

Sanitation-related interventions, specifically waste/wastewater management and latrine interventions, were addressed in four (19%) articles and included two publications from Africa, and one each from Haiti and from Thailand.[60,94–96] Most (n=3, 75%) of the sanitation-related intervention articles reported on interventions in non-camp settings that were urban. Study sites and populations were not always well described, though two studies were conducted in emergency-affected (non-displaced) populations.

Interventions of focus

Included articles reported on the effectiveness of a wide range of interventions addressing WASH topics, including water quality (n=12, 57%),[46,53,55,61,86,90–93,95,98,99] education/promotion (n=10, 48%),[34,46,53,55,57,86,90,93–95] in-kind assistance (n=4, 19%),[53,86,100,101] waste/wastewater management (n=4, 19%),[60,94–96] environmental hygiene (n=3, 14%),[49,53,55] water quantity/supply (n=3, 14%)[93,94,98] and water storage (n=2, 10%).[92,99]

In terms of location, most WASH interventions (n=15, 71%) were community-based, with far fewer that were facility-based (n=3, 14%), system-level (n=1, 5%), or multi-level (n=2, 10%). Approximately half of WASH articles (n=11, 52%) reported on interventions implemented primarily by lay personnel, four (19%) by a mix of lay personnel and health professionals and one (5%) solely by health professionals. Five (24%) articles did not specify types of personnel involved in the intervention. A total of eight (38%) WASH articles reported on interventions that were part of a broader multi-sector programme or intervention strategy. Specific interventions and outcomes for each category are summarised below.

Water quality

The largest proportion of WASH articles focused on water quality interventions (n=12, 57%).[46,53,55,61,86,90–93,95,98,99] Interventions classified as relating to water quality included point of use (PoU) water treatment interventions: chlorine tablets to treat household water sources (n=8, 67%);[53,55,61,86,91,92,98,99] point of source (PoS) interventions to disinfect/decontaminate, repair and/or install water sources (n=4, 33%);[53,90,93,99] and a behaviour change communication (BCC)/education intervention (n=1, 8%).[46] Three-quarters (n=9) of the WASH articles reporting on water quality interventions utilised observational study designs compared to only two mixed-methods studies[90,98] and one quasi-experimental study.[92] More than half of the water quality interventions were implemented in Haiti (n=7, 58%). A similar number (n=8, 67%) were implemented in outbreak settings, including those concurrent with environmental disasters.

The majority of water quality interventions (n=10, 83%) were community-based, though two (17%) were implemented at multiple intervention sites, including one article that assessed provision of technical assistance to improve chlorination of drinking water and monitor water quality in Ethiopia;[99] and another study examining three water source chlorination interventions (bucket, in-line and piped water chlorination) in Bangladesh.[98] Most of the water quality interventions (n=7, 58%) were carried out by lay personnel. Only one intervention, monthly household counselling visits by a nurse in Thailand,[95] was implemented by health professionals. Another two articles were implemented by a combination of lay personnel and a health professional cadre, both of which studied CATI cholera response strategies in Haiti,[53,55] while two others (17%) did not specify personnel type.

Just under half of the articles assessing water quality interventions reported contamination-related outcome measures including Escherichia coli (E. coli) (CFU/100 mL),[91,92,98] Vibrio cholerae,[61] turbidity,[91–93,98] contamination with faecal/total coliforms[61,91,93] and bacteriological risk.[93] Similarly, four articles measured chlorine levels as primary outcomes, two of which measured both contamination and chlorination.[92,98] A comparable number of water quality intervention articles (n=5, 42%) reported behaviour-related outcome measures, most commonly including use of chlorine dispenser systems[90] and of household water treatment and safe storage intervention items;[92] household water sources, transport and storage;[86] and household water treatment practices.[46]

Water quantity and supply

Water quantity and supply interventions, including those pertaining to infrastructure and supply chain, were less commonly studied, accounting for only three (15%) WASH articles.[93,94,97] These articles focused on diverse interventions in varied implementation sites and contexts. Two of the articles reported findings from mixed-methods studies[94,97] and the third reported on an observational (pre-post) study.[93]

The first water quantity/supply article assessed health facility-based WASH renovations, mentoring and supply chain improvements in Liberia using pre-post quantitative data and cost analyses.[94] The second article examined tanker truck water delivery in the DRC and Bangladesh using mixed methods including qualitative methods, water collection and distribution point observations, household surveys and water quality testing.[97]

The third water quantity/supply article assessed post-flood shallow well cleaning, well improvement, water treatment and hygiene awareness in Pakistan using a pre-post observational study design.[93] Two of these studies were implemented in rural, non-camp settings in Liberia and Pakistan; while the other was implemented in urban settings in two countries (DRC and Bangladesh) both in and out of camps.

Primary outcome measures in two of the three water quantity and supply intervention articles were contamination measures, including risk-of-contamination ranking before and after well cleaning, turbidity, pH, biocides, fluoride and arsenic,[93] as well as E. coli (CFU/100 mL) at various water-system points, free residual chlorine (FRC) and programme effectiveness compared to key Sphere indicators.[97] Outcomes in the third article focused on behaviours, specifically behavioural compliance (proper handwashing) before and after a single patient-care event; this was also the only WASH article to report cost-related outcomes including estimated and actual implementation costs (but not cost-effectiveness or efficiency).[94]

Water storage

Interventions in only two (10%) WASH articles incorporated water storage components.[92,99] These included an observational study of multi-level technical assistance to improve chlorination of drinking water and monitor quality in Ethiopia[99] and a quasi-experimental study of five different household water treatment and safe storage programmes (Aquatabs + training; Aquatabs only, ceramic filters + training; biosand filters + training; Klorfasil chlorine powder) in Haiti.[92] Due to the multi-pronged nature of these interventions, the primary outcomes measured included a range of indicator types including chlorine levels, effective household use of the intervention and E. coli (CFU/100 mL).

Waste and wastewater management

All articles included in HHER2 with interventions related to sanitation focused on waste and wastewater management, accounting for four (19%) articles.[60,94–96] Only one of the four articles focused on wastewater management,[60] reporting on a quasi-experimental study of disinfection of wastewater in a cholera treatment centre in Haiti. This was the only article in this category to measure contamination outcomes and also the only one where wastewater management was the sole intervention being assessed.

The three articles evaluating waste management interventions all incorporated additional WASH interventions (water quality, water quantity/supply and/or education/promotion activities) and were part of broader multi-sector programmes or intervention strategies. The three studies used different research designs including observational, quasi-experimental and mixed-methods. Only one waste management article was facility-based (WASH renovations, mentoring and supply chain improvements).[94] The other two waste management articles were community-based: (1) monthly household nurse visits to mother-infant pairs in Thailand for appropriate infant feeding and WASH practices (namely, safe disposal of infant stool);[95] and (2) a variety of water, sanitation and waste management interventions financed by the Angola Social Action Fund between 1994 and 2001, which were not explicitly described in the article.[96]

Education and promotion

Nearly half of included WASH articles (n=10, 48%) reported on education/promotion interventions.[34,46,53,55,57,86,90,93–95] Of these articles, only two did not include additional WASH interventions, one of which implemented a messaging campaign for handwashing and cholera prevention practices as part of a preventive oral cholera vaccine campaign,[57] while the other sought to improve infection prevention and control behaviours in primary healthcare facilities during an Ebola outbreak in Sierra Leone.[34] Three articles reported on mixed-methods studies of education/promotion interventions and the remaining seven articles reported on observational studies.

Most interventions related to education and promotion (n=8, 80%) were community-based, though two (20%) were facility-based, including the aforementioned article reporting on infection prevention and control behaviours in Sierra Leone[34] and another article that studied WASH renovations, mentoring and supply chain improvements at health facilities in Liberia.[94] WASH education and promotion interventions were also predominantly implemented among emergency-affected (non-displaced) populations (n=8), with only two of the ten studies conducted in refugee populations. The two articles reporting on WASH education and promotion interventions among refugees were also the only two implemented in non-camp settings and both were related to conflicts in Thailand.[57,95] Of the remaining articles, five reported on interventions in outbreak settings and only one in relation to an environmental disaster (flooding in Pakistan).
While the content of education and promotion interventions was often not reported in detail, interventions focused on cholera prevention messaging (n=2), chlorination/water treatment (n=2) and other general hygiene promotion and/or handwashing-related topics (n=4). Outcome indicators for WASH education and promotion interventions included behaviour-related indicators such as handwashing practices, use of chlorine dispenser systems, safe disposal of infant stool and household water treatment, along with household water sources, transport and storage.

In-kind assistance

Only four (19%) articles explicitly reported on in-kind WASH assistance, including handwashing bags,[101] soap[53,100] and hygiene kits.[86] Three of these were observational studies and the fourth, a 'toy soap' handwashing promotion intervention for older IDP in Iraq, was a quasi-experimental study.[100]

While other interventions may have been implemented but not reported, two of the identified in-kind assistance studies reported implementing additional WASH interventions. The first studied CATIs (which typically deliver a package intervention that may include decontamination spraying; education on cholera risk factors, prevention and management; distribution of soap and oral rehydration salts; and household and/or water collection point chlorination) in Haiti.[53] The second examined a combined intervention including chlorination of water supplies, hygiene promotion and hygiene kit distribution among people affected by a hepatitis E virus outbreak in Chad.[86] While the CATI study from Haiti involved both health professionals and lay personnel in its implementation, only lay personnel were reportedly involved in the remaining three studies.

Outcome measures varied across all four in-kind assistance intervention articles. Behaviours constituted the sole primary outcome measures in two articles including use of handwashing bags in Ethiopia[101] and the toy soap handwashing promotion intervention in Iraq.[100]

A third article on chlorination of water supplies, hygiene promotion and hygiene kit distribution in Chad measured hygiene behaviour, water sources, transport and storage, and also reported FRC levels in stored drinking water.[86] The fourth article assessing CATI implementation in Haiti reported outcomes related to implementation, namely CATI effectiveness according to response promptness and response intensity.[53]

Environmental hygiene

Three articles reported on an environmental hygiene intervention.[49,53,55] All were community-based interventions that involved household spraying for decontamination during a cholera outbreak in Haiti, though one also studied household spraying programmes in cholera-endemic areas of the DRC.[49] The study from the DRC was the only intervention implemented in a camp setting. The other articles, implemented only in Haiti, both assessed implementation of CATIs using observational study designs. The study on household spraying programmes in cholera outbreaks in the DRC and Haiti measured only contamination outcomes (both Vibrio cholerae and E. coli), while the two articles assessing CATI implementation measured effectiveness according to responsiveness, promptness, intensity and quality of CATIs in response to cholera alerts.[53,55]

Cumulative summary of recent WASH publications

Together, HHER1[2] and HHER2 identified 27 articles that report on effectiveness and/or costs of WASH interventions in humanitarian settings that were published in between 1980 and April 2021. Comparison of articles included in HHER1 and HHER2 suggests an increase in both volume and diversity of WASH research in recent years (Figure 5.6).

Figure 5.6 Comparison of WASH research across evidence reviews

Study design and quality	**HHER1 (1980–2013) 6 articles**	**HHER2 (2013–2021) 21 articles**
Study design		
Experimental	2	-
Quasi-experimental	1	4
Observational	**3**	**11**
Mixed-methods	-	6
Economic evaluation	-	-
Study quality		
Low risk of bias	Comparable quality assessment not completed in HHER1.	8
Moderate risk of bias		1
High risk of bias		3
Unclear risk of bias		**9**

Study characteristics		
Region		
Africa	**5**	6
Asia	-	4
Latin America/Caribbean	1	**7**
Middle East	-	1
Europe	-	-
Multiple	-	3
Crisis type		
Armed conflict	**5**	6
Environmental disaster	1	2
Outbreak	-	**7**
Multiple	-	6
Population type		
Refugee	2	4
Internally displaced	**3**	1
General population	1	**13**
Multiple	-	2
Not specified	-	1
Study topics and interventions		
Topic area		
Water	**5**	**15**
Sanitation	1	4
Hygiene	3	12
Multiple	2	8
Intervention type*		
Water quality	**3**	**12**
Education/promotion	2	10

Waste(water) management	-	4
In-kind	2	4
Environmental hygiene	-	3
Water storage	**3**	2
Multiple	**3**	10

Changes in research between the review periods

HHER1 found six WASH articles published from 1980 to 2013, while HHER2 found more than three times as many articles in roughly a quarter of that time. Compared to only three observational studies in HHER1, more than half of articles included in HHER2 reported on observational studies. HHER1 included two experimental articles, whereas no experimental studies were identified in HHER2. Compared to only one in HHER1, four articles in HHER2 reported on quasi-experimental studies in addition to six HHER2 articles on mixed-methods studies (compared to no articles in HHER1).

Five out of six articles in HHER1 reported on interventions in Africa and only one article reported on interventions in Latin America and the Caribbean. While a notable number of the articles in HHER2 also reported on interventions in Africa, there was an increase in the number of articles covering interventions in Latin America and the Caribbean, though this was specifically in relation to Haiti, which accounted for all publications in the region. This is due to the substantial body of research on WASH interventions in the wake of the 2010 earthquake and cholera outbreak(s) in Haiti. Interventions in Africa, Asia and the Middle East were also represented in HHER2 but not in HHER1, indicating geographic diversification in WASH research over time. The vast majority of articles in HHER1 focused on interventions in areas affected by armed conflict, whereas HHER2 included articles on interventions that were distributed in areas affected by armed conflict, outbreaks or multiple types of humanitarian crises. Interventions primarily targeted refugees and IDPs in HHER1, while HHER2 saw a shift towards interventions that focused more on the general population (primarily emergency-affected/non-displaced populations).

The distribution of articles assessing interventions related to WASH or a mix thereof remained largely the same between HHER1 and HHER2, with the largest number of articles in both reviews addressing water and hygiene. It is not possible to discern trends in intervention types included in HHER1 given the relatively small number of included articles and even distribution of intervention types. However, several differences in available evidence across types of interventions are apparent in HHER2. The most frequent intervention types in HHER2 shifted to water quality and education/promotion, increasing from three articles in HHER1 to 12 in HHER2 for water quality, and from two to ten articles for education/promotion. HHER2 also saw a diversification of intervention type, with waste/wastewater management and environmental hygiene interventions also represented. A notable number of articles in HHER2 also studied multiple types of interventions.

WASH evidence gaps

HHER1 highlighted several gaps in the evidence for WASH interventions in humanitarian contexts, primarily the dearth of economic analyses, lack of evidence on specific health outcomes, and insufficient evidence of linkages between WASH, communicable diseases and nutrition.[2] While no articles in HHER2 focused primarily on assessing cost-effectiveness, one mixed-methods article published in 2021 included an economic analysis component with findings demonstrating the substantial added value of as yet under-utilised economic analyses.[94] The absence of evidence on the effectiveness of WASH interventions for health outcomes persists as none of the articles identified in HHER2 explicitly measured direct health outcomes. Since HHER1, however, progress has been made in advancing evidence of links between WASH and communicable diseases and nutrition. Of the 21 WASH articles in HHER2, eight were also included in the Communicable Disease Control review and two others were included in both the WASH and Nutrition reviews.

The systematic review that synthesised WASH findings from HHER1 provided additional commentary regarding gaps in the evidence base.[6] Specifically, it was noted that despite evidence on the effectiveness of WASH interventions in improving water quality or other WASH indicators, studies assessing WASH interventions in relation to health outcomes (particularly non-diarrhoeal diseases) in humanitarian settings are a critical gap. The article further indicated the need for evidence that reports impacts on uptake and/or behaviour change, which HHER2 shows has been reflected in more than half of the WASH articles published since HHER1. The article also recommended two specific WASH interventions for evaluation: (1) water quality interventions beyond PoU; and (2) alternative hygiene interventions beyond soap distribution. Evidence in these two areas saw an increase since HHER1 with two articles in HHER2 that evaluated PoS water quality interventions and hygiene interventions in all but one article incorporating components other than, or in addition to, soap distribution.

Since HHER1 was conducted, four additional systematic reviews of WASH interventions in humanitarian settings have been published,[102–104] in addition to numerous literature reviews of specific types of WASH and cross-cutting interventions in humanitarian contexts (e.g. menstrual hygiene management,[105] chlorination of drinking water[106] and WASH components in cholera rapid response teams,[107] among others),[102] as well as a gap analysis of WASH in humanitarian response conducted in 2021.[108] One of these reviews focused broadly on short-term WASH interventions in emergency response;[103] two focused on the impact of WASH interventions (and specifically household water treatment) in controlling cholera;[102,109] and the third focused on delivering WASH interventions to women and children in conflict settings.[104] A review by Yates et al. (2018) WASH review noted gaps in research on several specific interventions, including repairing damaged waterpoints, water trucking, bucket chlorination, household spraying, handwashing, latrine construction and environmental clean-up,[103] many of which are also included in a review by Als et al. (2020) of WASH interventions for women and girls where delivery of household water treatment, source-based water treatment and environmental hygiene interventions were cited as having limited evidence.[104] HHER2 identified articles that evaluated many of these interventions including water trucking, household spraying and handwashing, many of which also measured behavioural outcomes, a need noted in the full review report by Yates et al. (2018).[110]

Yates et al. (2018) also highlighted a need for cost-effectiveness research on WASH interventions in emergencies.[103] This was also noted in HHER1 and persists, as evidenced by the absence of formal cost-effectiveness studies in HHER2. Among other research needs identified in these reviews that remain relevant based on HHER2 is a lack of studies examining disease outcomes.[102,103] While all the articles in HHER1 measured diarrhoeal outcomes, none of the studies included in HHER2 measured direct health outcomes related to disease, including diarrhoeal outcomes. Finally, an important consideration for developing and disseminating research of relevance for practical application, Als et al. (2020) noted challenges in capturing information about intervention implementation from WASH articles, namely where and by whom interventions were conducted.[104] This also proved challenging in HHER2 where personnel involved in intervention implementation were not specified in nearly a quarter of the included articles. Overall, the relatively limited number of studies of WASH intervention effectiveness in humanitarian settings in relation to health outcomes, particularly given the diversity of WASH interventions and the mechanisms by which they impact population health, suggests that research on the effectiveness of a wide range of interventions, especially in relation to health outcomes, is still needed.

A research prioritisation exercise conducted in 2018 also highlighted critical areas of focus for WASH research.[111] The ten specific priorities identified in the 2018 exercise focus on: WASH for cholera prevention and control (as well as oral cholera vaccine and WASH intervention coordination); menstrual hygiene management; design and targeting of hygiene kits; WASH in malnutrition programmes; WASH-related enteric disease and transmission; WASH for reproductive, maternal and neonatal health; strengthening hygiene sanitation components of WASH programmes; and WASH as part of the effective transition between emergency and development. HHER2 found few, if any, studies that address these research priorities.

One challenge faced in HHER2, given its focus on health, was that many WASH studies without references to health outcomes or that described behaviours or perceptions but did not report on intervention effectiveness were excluded because they were not within the scope of the review. As such, it should be noted that the WASH evidence base is larger than the studies captured in the present review. It is likely that studies addressing many of the evidence gaps and research priorities have recently been published and would likely be identified using a broader WASH search strategy. A more detailed explanation of the HHER2 search strategy and criteria and a discussion of other relevant WASH publications are provided in Annex 7.

Recommendations for future WASH research

Despite the recent proliferation of research on the effectiveness of WASH interventions in relation to health in humanitarian settings, the overall size and scope of the evidence base is limited. Priorities for future WASH, and WASH and health research that were identified include the following:

- HHER1 noted an evidence gap on the impact of WASH interventions in relation to health and disease outcomes, particularly non-diarrhoeal diseases. While some recent WASH research has sought to characterise casual pathways and establish linkages with health and nutrition outcomes, **the evidence base for WASH intervention effectiveness on health and nutrition outcomes remains limited**.

- Another persistent evidence gap is cost-effectiveness research on WASH interventions in humanitarian crises. **Future WASH research should endeavour to include a costing component** as a means of expanding this very limited evidence base.

- The current WASH evidence base is diverse in terms of geographic region, affected population type and settings in which research is conducted; this diversity should be maintained. The evidence base for sanitation interventions, particularly for excreta disposal, is limited in comparison to water and hygiene evidence, though it is unclear whether this is an evidence gap that should be prioritised given that it was not highlighted by recent reviews or prioritisation exercises.

- Several recent reviews noted gaps in the evidence based on specific types of WASH interventions. Among water interventions, these included **repairing damaged waterpoints, water trucking, bucket chlorination, water quality interventions beyond PoU, latrine construction, household spraying, environmental clean-up, handwashing and alternative hygiene interventions beyond soap distribution** such as hygiene kits. While some recent publications focus on these subjects, the evidence gaps for these topical areas persist and should be considered in prioritisation of future research.

- Eight (38%) of the 21 articles included in this review were judged to have a low risk of bias; the others were classified as having either a moderate or high risk or did not report in a sufficient level of detail to be included in quality appraisal. Inadequate descriptions of intervention implementation have also been noted as a limitation in the WASH literature that may inhibit replication of successful interventions. **Improved reporting on WASH interventions, research design and implementation** is critical for strengthening the WASH evidence base.

6
Nutrition

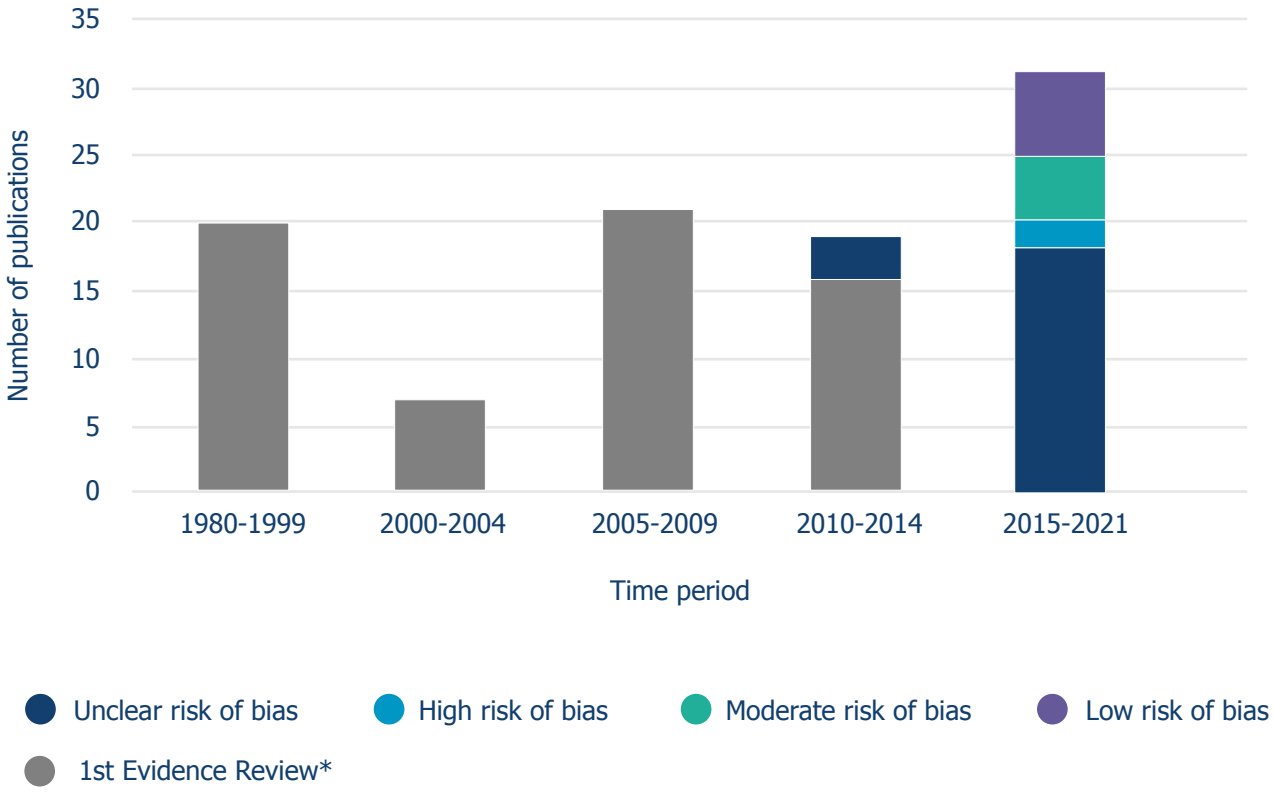
6. NUTRITION

34 Peer-reviewed publications in 8 years

Overview of literature search findings

Of 269 peer-reviewed articles meeting eligibility criteria across all topic areas, 34 (13%) reported on nutrition. The 34 peer-reviewed articles presented findings from 26 unique studies. A detailed summary of included studies is presented in Annex 8. The number of nutrition articles published in the past eight years is just under half the total number of articles (n=77) included in HHER1, which spanned a 32-year period. With an average of 2.4 and 4.3 publications annually in HHER1 and HHER2, respectively, a notable increase in nutrition research has occurred over the course of the two reviews, with the largest volume of publications in the 2015–2021 time period.± This progression in publication volume is illustrated in Figure 6.1.

Figure 6.1 Quantity and quality of nutrition publications over time



*Non-comparable quality appraisal was conducted in HHER1 (1980-2013).

± HHER1 data presented in this chapter also includes "category C" studies, in which output (rather than outcome) measures were reported. The same is the case in the Health Service Delivery chapter. All other chapters report "category A" (health-related outcomes measures with statistical tests) and "category B" (health-related outcomes measures without statistical tests) studies only.

Study designs and research quality

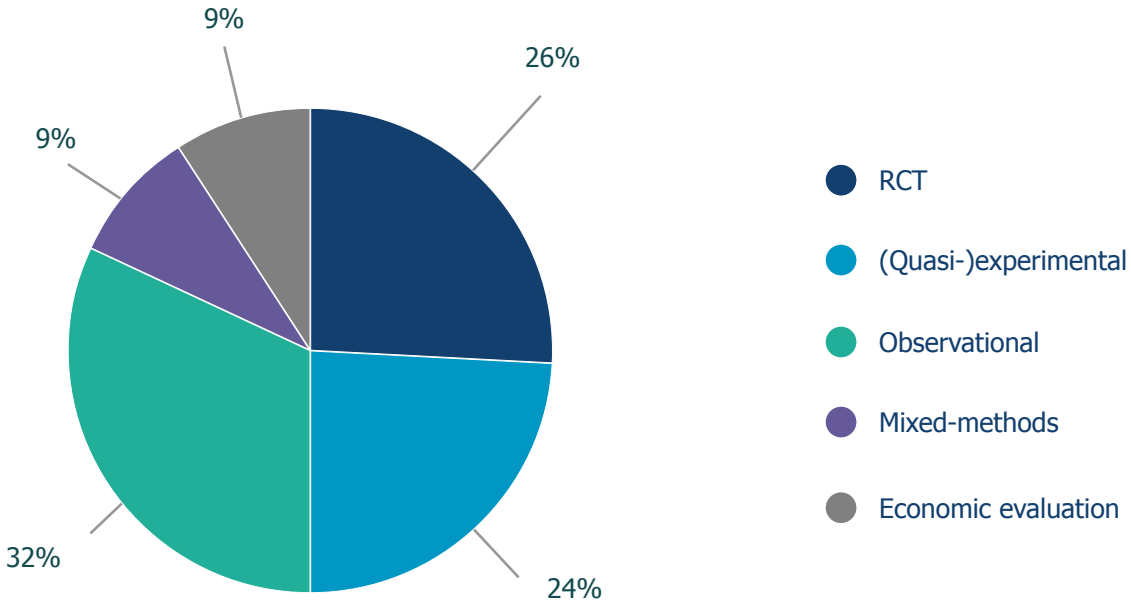
Included articles were categorised by study design and risk of bias was assessed accordingly for each article. A summary of study design and quality appraisal findings follows.

Study designs

The most common study design among articles reporting on nutrition was observational, with 11 (32%) articles, among which two reported on traditional cross-sectional studies, two on repeated cross-sectional studies (with different respondents at each time point), two on pre-post studies and another two that focused on cohort studies. Findings from RCTs were reported in nine (27%) articles and eight (24%) articles reported on findings from quasi-experimental studies. Only three (9%) articles used a mixed-methods study design and three (9%) others performed economic evaluations (Figure 6.2).

Sample sizes in articles reporting on nutrition ranged from 20 (mother-infant pairs to evaluate a counselling intervention)[95] to 351,795 (children targeted in population-based nutrition screening);[19] [14] (41%) articles had a sample size between 100 and 1,000 and 17 (50%) studies had sample sizes greater than 1,000.

Figure 6.2 Nutrition research by type of study design

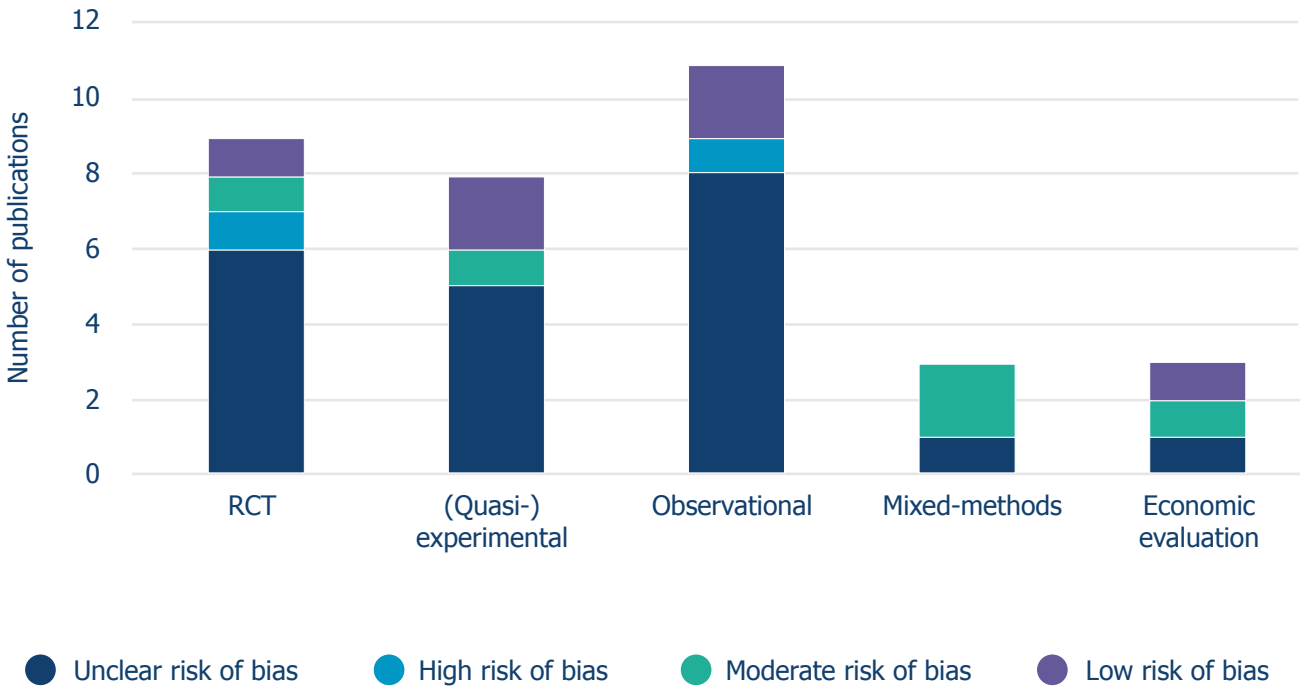


Quality appraisal

Of the 34 articles reporting on nutrition interventions, 13 (38%) included sufficient information to make a judgement on the risk of bias. Based on their study designs, six (18%) articles were judged to have a low risk of bias, five (15%) a moderate risk and two (6%) a high risk. The remaining 21 (62%) articles were determined to have an unclear risk of bias based on the information available in the article (Figure 6.3).

Of the nine articles reporting findings from RCTs, six had an unclear risk of bias, with one judged to have a high risk, one a moderate risk and one a low risk. Similarly, five of the eight quasi-experimental studies had an unclear risk of bias. Most notably, eight of the 11 articles reporting findings from observational study designs had an unclear risk of bias and of the remaining articles, two were deemed to have a low risk and one a high risk.

Figure 6.3 Risk of bias in nutrition publications, by study design



Research location, setting and population type

The location, setting and population type of study for nutrition intervention research in humanitarian contexts is summarised in Figure 6.4; a map of countries in which nutrition research was conducted is provided in Annex 4. Geographically, the largest proportion of nutrition articles reported on interventions in Africa, accounting for 19 (56%) articles. Interventions in Asia were reported in nine (27%) articles, while three (9%) reported on interventions in the Middle East and two (6%) in Latin America and the Caribbean. The remaining article reported on interventions in study sites located in multiple regions (Africa and Latin America and the Caribbean).

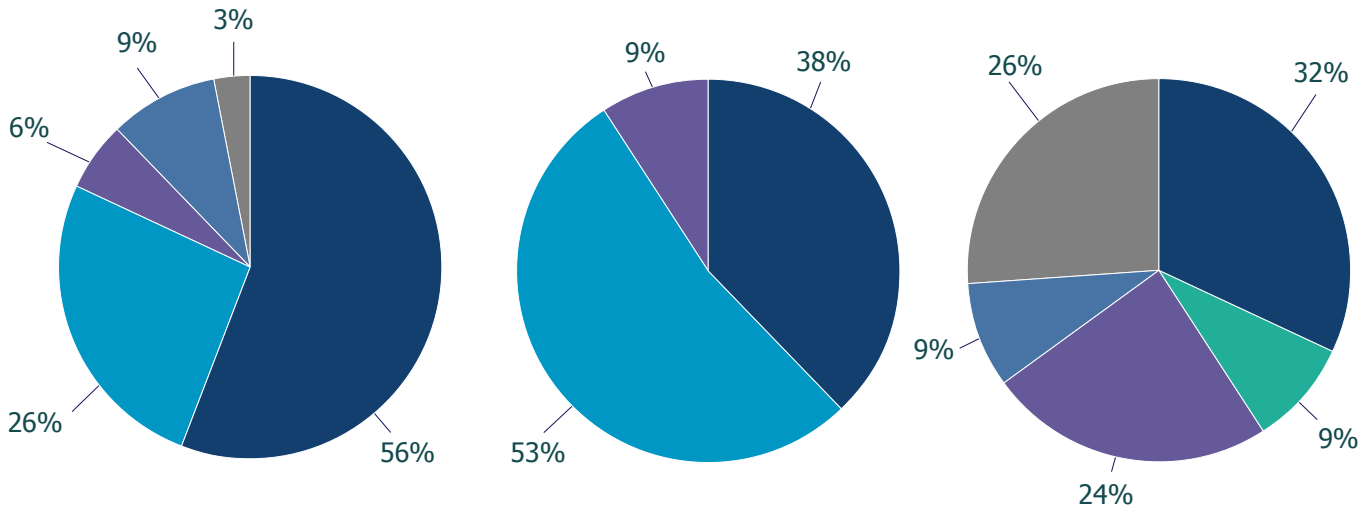
Areas affected only by environmental disasters (including drought and food shocks) with no concurrent violence/conflict were the most frequently represented among included nutrition articles (n=18, 53%). Fewer articles (n=13, 38%) reported on interventions in areas affected by armed conflict only. The three (9%) remaining articles reported on interventions occurring in areas affected by both armed conflict and drought/environmental disasters.

More than half of articles (n=18, 53%) reported on interventions in rural areas. Interventions in urban areas were reported in eight (24%) articles and five (15%) articles reported on interventions in both urban and rural areas, while the urban or rural setting was not clear in three (9%) articles.

More than two-thirds of articles (n=24, 71%) reported on interventions occurring in non-camp settings, compared to nine (27%) that concentrated on camp settings and one (3%) occurring in both camp and non-camp settings.

Included nutrition articles most frequently reported on interventions for emergency-affected (non-displaced) populations (n=11, 32%), followed by refugees (n=8, 24%) and IDPs (n=3, 9%). Interventions for multiple population types were uncommon, accounting for only three (9%) articles. Of the articles reporting on interventions in multiple population types, all included emergency-affected (non-displaced) populations and IDPs in contexts affected by armed conflict. Population type was not specified in nine (27%) articles.

Figure 6.4 Distribution of nutrition publications by region, crisis and population type

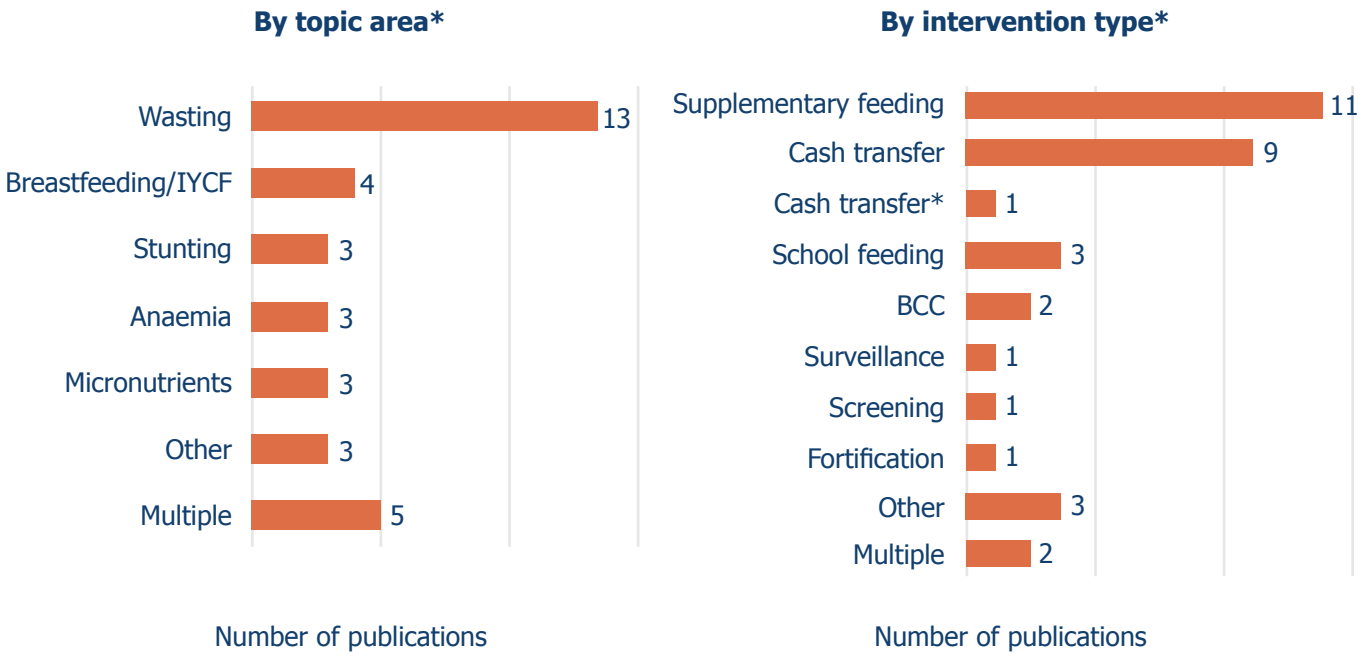


Topical areas and interventions of focus

Topical areas of focus

Figure 6.5 presents an overview of the distribution of topics and interventions across articles reporting on nutrition interventions. The 34 nutrition articles included in HHER2 were further categorised by topic area using categories modelled on those reported in HHER1 to facilitate assessment of changes in evidence between the two reviews. Articles focused on wasting accounted for the largest proportion of nutrition articles (n=13, 38%).[19,112–123] The majority of research was from Africa (n=11, 85%) and involved emergency-affected (non-displaced) populations (n=7, 54%) in environmental disaster contexts (n=9, 69%). Almost all the articles that focused on wasting described non-camp settings (n=12, 92%) that were rural (n=8, 62%).

Figure 6.5 Nutrition research by topics and interventions of focus



*Compared to in-kind food

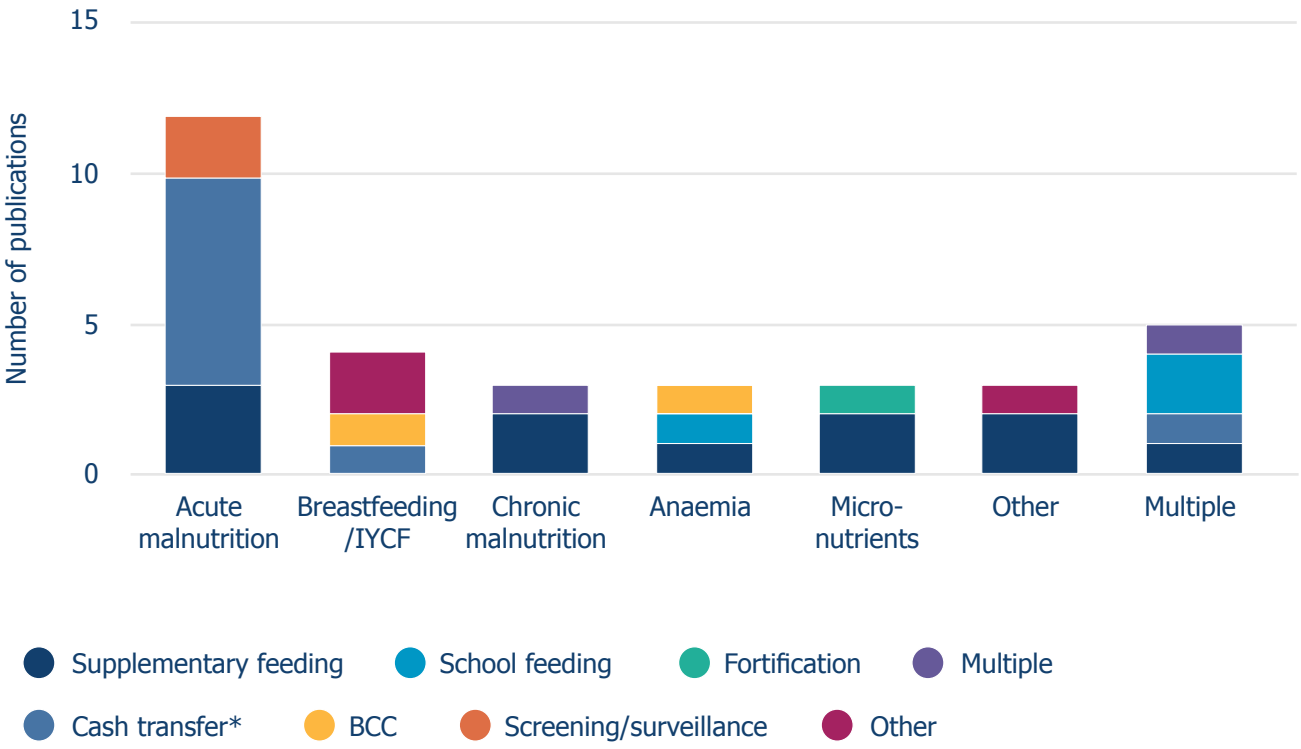
Far fewer articles focused on breastfeeding/infant and young child feeding (IYCF) (n=4, 12%),[95,124–126] stunting (n=3, 9%),[96,127,128] anaemia (n=3, 9%),[129–131] micronutrients (n=3, 9%),[132–134] and other nutrition topic areas (n=3, 9%).[135–137] Five articles (15%) incorporated multiple topic areas.[138–142] Although study settings and participant populations varied by topic area, given the relatively small number of articles focusing on many specific nutrition topic areas, notable trends were difficult to discern. Types of study participants were relatively evenly distributed across topic areas, with the exception of research focused on multiple topic areas, which was mostly conducted in refugee populations (n=4, 80%). Articles focused on breastfeeding/IYCF, and both other and multiple topic areas, were largely concentrated in armed conflict contexts and rural locations.

Of the three articles including cost and/or cost-effectiveness outcomes, one evaluated cost-effectiveness for a primary stunting outcome,[114] one based cost-effectiveness on multiple nutrition outcomes,[128] and the third reported cost per household/individual and cost transfer ratios with unspecified nutrition outcomes.[115]

Interventions of focus

Included articles reported on the effectiveness of a wide range of interventions including supplementary feeding (n=11, 32%),[114,116,119,127,128,130,132,133,136–138] cash transfers (n=10, 29%)[112,113,115,117,118,120–122,125,141] including one article comparing cash transfers to in-kind food,[141] school feeding (n=3, 9%),[131,140,142] BCC (n=2, 6%),[95,129] fortification (n=1, 3%),[134] screening (n=1, 3%),[19] surveillance (n=1, 3%)[123] and other nutrition interventions (n=3, 9%).[124,126,135] Only two (6%) articles reported on multiple nutrition interventions (Figure 6.6).[96,139]

Figure 6.6 Types of interventions evaluated in nutrition publications



The majority of articles (n=28, 82%) reported on community-based interventions. School-based interventions accounted for only two (6%) articles, though one additional article reported on a community- and school-based intervention. Similarly, one article reported on a facility-based intervention and another article on a community- and facility-based intervention. Implementation site was unclear from the information provided in the remaining article. Fewer than a third of articles (n=10, 29%) reported on interventions that were part of a broader multi-sectoral programme or intervention strategy.

With respect to personnel engaged in nutrition interventions, eight (24%) articles reported on interventions implemented by both a health professional cadre and lay personnel, while six (18%) articles reported on interventions implemented by lay personnel only and one (3%) by health professionals only. More than half of nutrition articles either did not require or did not specify implementing personnel type (n=18, 53%). Health professional cadres involved in interventions included nurses, doctors, psychologists, psychosocial workers and nutritionists. Lay personnel primarily consisted of community volunteers, but also included teachers and cooks.

Wasting

Of the 13 articles focused on wasting, more than half (n=8, 62%) were cash transfer interventions consisting of conditional cash transfers (n=1),[122] unconditional cash transfers (n=4),[113,115,117] vouchers combined with unconditional cash transfers,[120,121] or vouchers compared to unconditional cash transfers (n=3).[112,118,120,121] Of the five articles reporting on interventions for wasting other than cash transfers, three reported on supplementary feeding,[114,116,119] one on integration of mass nutrition screening (using mid-upper arm circumference (MUAC)) during a polio vaccine campaign,[19] and one on nutrition sentinel site surveillance.[123] Given the concentration of wasting research with similar outcomes, key findings regarding prevalence/incidence/odds, weight-for-height/-length z-score (WHZ/WLZ) and MUAC are summarised in Figure 6.7.

Figure 6.7 Summary of wasting evidence from humanitarian settings (2013–2021)

Author, location, intervention type	Comparison groups and intervention	Results	WHZ	MUAC
Bliss (2018)[122] Niger Cash transfer	Two-group comparison Children 6–24 months Cash (Ca) vs control (Co)	Odds of wasting aOR 0.04 (0.2–0.12), p<0.001	Mean WHZ Ca: 0.3 ± 1.0 Co: -1.2 ± 1.0 aDiD: 1.82, p<0.001	Mean MUAC (cm) Ca: 1.42 ± 0.10 Co: 1.37 ± 0.10 aDiD:0.7cm, p<0.001
Doocy (2020a)[120] Somalia Cash transfer	Two-group comparison Pregnant + lactating women Vouchers vs mixed transfers	Wasting prevalence V: 2.9% (-0.4–6.1%) M: 0.0% (0.0–1.4%) aDiD: -2.9%, p=0.086	–	Mean MUAC (cm) (aDiD) V: 0.9 (0.6–1.3) M: 1.3 (1.1–1.5) aDiD: 0.4, p=0.086
Doocy (2020b)[121] Somalia Cash transfer	Two-group comparison Children 6–59 months Vouchers vs mixed transfers	Wasting prevalence V: 0.7% (-13.1–24%) M: -4.8% (-12.0–6.4%) aDiD: -5.5%, p=0.58	–	Mean MUAC (cm) V: 0.5 (0.0–0.8) M: 0.1 (-0.2–0.4) aDiD: -0.4, p=0.13

Fenn (2017)[118] Pakistan Cash transfer	Three-group randomised trial Children 6–48 months Single cash (SC), double cash (DC), fresh food voucher (FV)	Odds of Wasting aOR SC=1.1 (0.7–1.7), p=.66 DC=0.80 (0.5–1.2), p=0.32 FV=1.2 (0.8–1.8), p=0.50	Mean WHZ SC=-0.1 (-0.2–0.0) DC=0.0 (-0.1–0.1) FV=0.0 (-0.1–1)	–
Fabiansen(2016)[119] Burkina Faso Sup. feeding	Two-group comparison Children 6–23 months w/MAM Length <67cm vs >67cm	–	No significant difference in weight gain velocity	MUAC increase: 6% across groups, not significant
Grijalva-Eternod (2018)[117] Somalia Cash transfer	Two-group comparison Children 6–59 months Cash (Ca) vs control (Co)	Wasting prevalence Ca: -5.2 (-9.1–1.3) Co: -6.3 (-11.8–0.8) DiD: 1.1 (-5.6–7.8)	Mean WHZ Ca: 0.3 (0.0–0.5) Co: 0.5 (0.4–0.6) DiD: -0.2 (-0.5–0.5)	Mean MUAC (cm) Ca: 0.4 (0.2–0.6) Co: 0.4 (0.1–0.6) DiD: -0.1 (-0.4–0.2)
Leroy (2016a)[116] Burundi Sup. feeding	Four-group randomised trial Children 6–24 months Preg to 18 months (P18), Preg to 24 months (P24), Birth to 24 months (B24) vs controls	Wasting prevalence (DiD) P18: -4.5%, p<0.01 P24: -1.6%, NS B24: -2.6%, NS	–	–
Sibson (2018)[113] Niger Cash transfer	Two-group randomised trial Children 6–24 months 6-month vs 4-month transfers	GAM prevalence aOR 1.1 (0.8–1.6), p=0.63	–	MUAC<12.5cm aOR 0.9 (0.4–2), p=0.77

Notes: aDiD = adjusted difference in difference; aOR = adjusted odds ratio; DiD = difference in difference; italic indicates statistically significant difference; sup. = supplementary

Almost all interventions for wasting were community-based (n=12, 92%). The remaining article implemented a facility-based intervention providing new formulations of corn soy blend and lipid-based nutrient supplements to wasted children 6–23 months of age admitted for supplementary feeding at health centres in Burkina Faso.[119]

The 13 articles reported findings from seven unique studies with wasting as an outcome. Two articles reported on the same targeted food assistance interventions in Somalia for pregnant and lactating women and children under five years.[120,121] Another four articles reported on findings from Research on Food Assistance for Nutritional Impact consortium studies (two in Pakistan, one in Somalia and one in Niger).[112,113,117,118] The remaining seven articles each reported on findings from distinct studies.

Fewer than half of wasting articles (n=6, 46%) reported on interventions that were part of a broader multi-sector programme or intervention strategy, while the other seven articles reported on stand-alone interventions.

Articles focused on wasting utilised a range of study designs – four reported on quasi-experimental studies, three on RCTs, three on observational studies, two on economic evaluations and only one on a mixed-methods study. Of the 13 wasting articles, ten (77%) reported on intervention effectiveness and three (23%), including two economic evaluations and one mixed-methods study, reported on cost and cost-effectiveness. Outcomes of interest for experimental, quasi-experimental and observational studies included acute malnutrition/wasting prevalence/incidence/odds (n=8, 62%); WHZ/WLZ (n=5, 38%); MUAC (n=4, 31%); diet (n=4, 31%); weight gain (n=2, 15%); height-for-age z-score (HAZ)/length-for-age z-score (LAZ) (n=1, 8%); and stunting (n=1, 8%). Most of these articles (n=9, 69%) reported on more than one of these outcome categories and two reported on other outcome measures including validity of a nutrition surveillance approach (measured as agreement in global acute malnutrition estimates from cross-sectional surveys vs the study surveillance approach) and nutrition screening coverage.

Breastfeeding/IYCF

Four (12%) articles focused on breastfeeding/IYCF.[95,124–126] These included studies on a cash transfer intervention,[125] a BCC intervention (home visits by a nurse to provide counselling on infant feeding),[95] baby-friendly spaces,[126] and ready-to-use infant formula and baby tents in infant feeding programmes.[124] Observational studies accounted for two of the four breastfeeding/IYCF articles;[95,124] and the remaining articles reported on an RCT[125] and a mixed-methods study.[126]

The four breastfeeding/IYCF interventions were implemented in varied geographic regions. Three were implemented in armed conflict contexts and the other following the 2010 earthquake in Haiti. Three breastfeeding/IYCF articles were implemented in camp settings, two of which were with refugee populations and the other with IDPs. All breastfeeding/IYCF articles reported on community-based interventions.

All four of the breastfeeding/IYCF articles reported on intervention effectiveness. Breastfeeding practices were measured in three of the four articles; WAZ was the primary outcome in the fourth article. The three articles reporting breastfeeding outcome measures also reported other outcomes, including: perceived social support, psychosocial suffering and perceived mother–child relationship status in assessment of baby-friendly spaces;[126] dietary outcomes (e.g. dietary diversity, minimal acceptable diet) in evaluation of the nurse-led household BCC intervention;[95] and IYCF knowledge in the assessment of cash transfers conditional on attendance at monthly nutritional training sessions.[125]

Stunting

Only three (9%) of the 34 nutrition articles focused on stunting.[96,127,128] Two publications reported on an RCT of a food-assisted maternal and child health and nutrition programme in Guatemala (supplementary feeding);[127,128] one of these was an economic evaluation that also incorporated findings from a study in Burundi examining comparable interventions.[127] The third article reported on a quasi-experimental study to evaluate a number of social and economic development, health and water, sanitation and waste management projects.[96] All stunting articles were community-based and implemented in non-camp settings, two of which were rural and the third was in both urban and rural areas.

Of the three stunting articles, two reported on intervention effectiveness and one reported on cost-effectiveness. The two studies reporting intervention effectiveness both analysed HAZ/LAZ as the primary outcome and one reported stunting prevalence.[96,127] Outcomes in the economic evaluation included programme costs per beneficiary and costs per percentage point reduction in stunting.[128]

Anaemia/micronutrients

Six (18%) of the remaining nutrition articles focused on anaemia (n=3, 9%)[129–131] and/or micronutrients (n=3, 9%).[132–134] Anaemia interventions included BCC,[129] school feeding[131] and supplementary feeding.[130] Two articles on micronutrients also reported on supplementary feeding interventions[132,133] and the third micronutrient article evaluated a fortification intervention, specifically micronutrient-fortified flour for pregnant women.[134] Anaemia/micronutrient articles included observational (n=3), RCT (n=2) and mixed-methods studies (n=1). Of the six articles focused on anaemia and/or micronutrients, three were in Asia and three were in Africa. Interventions were implemented outside of camps in environmental disaster contexts in three articles and in camps in conflict contexts in two articles; the remaining article was implemented in an armed conflict context in Uganda in both camp and non-camp settings. Three studies were implemented in rural settings, one in an urban setting and one in both rural and urban settings; one did not specify rural or urban setting.

Outcome measures in all three anaemia articles necessarily included anaemia prevalence; two articles also reported haemoglobin levels[129,130] and one, a large-scale health and nutritional education programme in China, also reported on feeding knowledge and practices related to anaemia.[129] The three articles focused on micronutrients reported markedly different outcome measures from one another. The first article evaluated a ration for pregnant women that included micronutrient-fortified flour and reported on small-for-gestational age and preterm birth prevalence.[134] The second micronutrient article on complementary food supplementation in children aged 6–24 months reported on WLZ/wasting, LAZ/stunting and WAZ/underweight.[133] Outcome measures in the third article, which evaluated daily doses of lipid-based nutrient supplement among children, and micronutrient powder among both children and pregnant and lactating women, focused on adherence, consumption and acceptability of the intervention products among participants.[132]

Multiple

Of the 34 nutrition articles, five (15%) incorporated multiple topic areas.[138–142] Of these five articles, two implemented school feeding interventions,[140,142] one compared cash transfers (electronic food vouchers) to food rations,[141] one implemented supplementary feeding,[138] and the remaining article implemented a multi-disciplinary health and nutrition programme with multiple interventions.[139]

Three of these articles reported on observational studies[138,139,141] and two reported on quasi-experimental studies.[140,142] Likely reflecting the diversity of interventions studied, articles incorporating multiple topic areas reported on varied outcomes: stunting was reported in four articles; anaemia in three; HAZ/LAZ in three; and wasting prevalence, diet and haemoglobin levels were each reported in two articles. MUAC, WHZ/WLZ, WAZ, micronutrient intake and breastfeeding outcomes were each reported in only one article that spanned multiple topic areas.

Other

The remaining three articles (9%) focused on assorted other nutrition topic areas (n=3, 9%).[135–137] All three of these articles were implemented in environmental disaster, rural and non-camp contexts by NGOs. Two articles reported findings from an RCT evaluating a programme in Burundi, which consisted of three main interventions: (1) food rations for pregnant women and their children (<18 or 24 months of age); (2) activities to improve and promote health service provision; and (3) BCC on nutrition, health and hygiene practices.[136,137] Findings from this RCT were reported in a total of five included articles: wasting,[116] stunting,[128] anaemia[130] and two on other topics (motor and language development and standard food insecurity and diet indicators).[136,137] The third article focused on other nutrition topics reported in a quasi-experimental study of a microfinance programme in Indonesia providing loans to women, as well as a savings programme for borrowers.[135] Outcomes included meal frequency, school enrolment, clinic access and childcare.

Cumulative summary of recent nutrition publications

Together, the two humanitarian health evidence reviews identified 111 articles published between 1980 and April 2021 that report on effectiveness and/or costs of nutrition interventions in humanitarian settings*. Comparison of articles included in HHER1[2] and HHER2 suggests an increase in average annual volume and diversity of interventions in recent years (Figure 6.8).

Changes in research between the review periods

HHER1 found 77 articles published across 32 years, compared to almost half (n=34) as many articles in a third of the time in HHER2. The overwhelming majority of nutrition articles in HHER1 were observational studies, with only six articles reporting on experimental studies, two on mixed-methods and one on an economic evaluation. While observational studies still represented the largest proportion of HHER2 articles, the distribution compared to other study designs was far more varied, including more experimental and quasi-experimental studies, both in number and proportion, compared to HHER1.

The geographic distribution of interventions was relatively unchanged between the two reviews: interventions were most commonly implemented in Africa and to a lesser extent in Asia, with a limited number in other regions. Approximately half of the articles in HHER1 focused on interventions in areas affected by armed conflict and one-third of articles focused on environmental disasters. The opposite was true in HHER2 where more than half of articles focused on environmental disaster contexts and one-third in armed conflicts. The number of articles reporting on multiple types of humanitarian crises notably decreased in HHER2 compared to HHER1.

Interventions focused on general populations were most common in both reviews and the proportion of articles focused on refugees remained the same; however, more than a quarter of articles in HHER2 did not specify population type(s), while HHER1 benefited from complete population reporting.

*HHER1 data presented in this chapter also includes "category C" studies, in which output (rather than outcome) measures were reported. The same is the case in the Health Service Delivery chapter. All other chapters report "category A" (health-related outcomes measures with statistical tests) and "category B" (health-related outcomes measures without statistical tests) studies only.

In both reviews, wasting remained the most prominent topic area and was incorporated into more than two-thirds of HHER1 articles and one-third of HHER2 articles. While supplementary feeding interventions were also prominent in both HHER1 and HHER2, several types of interventions not represented in HHER1 were studied in HHER2 articles including cash transfers, school feeding, BCC, surveillance, screening and fortification.

Nutrition evidence gaps

HHER1 identified several key gaps in the evidence base for nutrition interventions and health in humanitarian settings including IYCF interventions, prevention and management of MAM and stunting, tools for monitoring and evaluation, and context-specific interventions.[2] Though the number of articles is limited, HHER2 found research on breastfeeding/IYCF and stunting to be the second and the third most common topic areas respectively, suggesting an important shift to address cited evidence gaps. Despite these advances, few of the other areas recommended for future research in HHER1 were represented in HHER2, notably in monitoring and evaluation methodologies, targeting people with disabilities and older people, service delivery (specifically community case management) and long-term effects of interventions.

Study design and quality	**HHER1 (1980–2013) 77 articles**	**HHER2 (2013–2021) 34 articles**
Study design		
Experimental	6	9
Quasi-experimental	-	8
Observational	**66**	**11**
Mixed-methods	3	3
Economic evaluation	2	3
Study quality		
Low risk of bias	Comparable quality assessment not completed in HHER1.	6
Moderate risk of bias		5
High risk of bias		2
Unclear risk of bias		**21**
Study characteristics		
Region		
Africa	**55**	**19**

Asia	15	9
Latin America/Caribbean	1	2
Middle East	2	3
Europe	3	-
Multiple	1	1
Crisis type		
Armed conflict	**37***	12
Environmental disaster	26	**18**
Outbreak	-	-
Multiple	15	4
Population type		
Refugee	18	8
Internally displaced	5	3
General population	**44**	**11**
Multiple	9	3
Not specified	-	9
Study topics and interventions		
Topic area		
Wasting	**53**	**13**
Breastfeeding/IYCF	‡	4
Stunting	12	3
Anaemia	12	3
Micronutrients	6	3
Other	20	3
Multiple	15	5
Intervention type§		
Supplementary feeding	30	**11**
Cash transfer	10	10

School feeding	-	3
BCC	-	2
Surveillance/screening	-	2
Other	**46**	4
Multiple	10	2

* Including one "political crisis"; †counts based on health outcomes listed for each article in detailed report table; categories are mutually exclusive for HHER2 but not for HHER1; ‡ IYCF outcomes not reported in HHER1, but four articles on IYCF interventions were noted; § counts based on intervention categories listed for each article in detailed report table.

Although no comprehensive systematic reviews on nutrition interventions in humanitarian crises have been conducted since HHER1, several specific reviews have focused on key populations and intervention types, in addition to numerous other less formal narrative and scoping reviews. Two recent systematic reviews focused on children, one of which examined effectiveness of nutrition interventions for children under five years following environmental disasters;[143] and the other, the impact of nutrition interventions on child mortality and nutrition outcomes.[144] Another systematic review of breastfeeding protection, promotion and support in humanitarian settings was also published in 2020.[145]

Among the evidence gaps cited in these reviews, there is a clear need for future research to incorporate common nutrition outcome indicators, as well as consensus on standard definitions of these indicators for more reliable comparison of results across studies.[143,144] Many of the articles included in HHER2 reported standard nutrition outcomes; however, variation in their definitions and/or reporting show that although there has been improvement, these remain relevant for future research. The need for inclusion of a control group was also noted in response to relatively few experimental study designs.[143] In terms of specific interventions, recent reviews emphasised the need for greater evidence of educational and bundled or multimodal rather than single interventions (e.g. medical consultations, vaccinations, deworming and supplementation), as well as interventions to improve breastfeeding.[144,145] While all of these interventions were increasingly represented in HHER2 articles relative to HHER1, their relatively limited number and variability in the representation of contexts and populations suggest that the need for more diverse evidence of their effectiveness remains.

In addition to recent reviews, the publication by Prudhon et al. (2016) of several research priorities for IYCF in emergencies provides useful insight into evidence gaps and future research needs for this specific issue.[143] Among these research priorities are the rigorous study of the effectiveness of interventions relating to cash transfers for breast milk substitutes, complementary feeding strategies, re-lactation and ready-to-use infant formula compared with distributing powdered infant formula plus kits. Additionally, the need for evidence of long-term intervention effectiveness was cited, echoing the same gap reported in HHER1, along with research linking IYCF interventions with other sectors such as WASH, as well as child protection. HHER2 found few studies that address any of these priorities.

Finally, there is little quality evidence on the efficiency or effectiveness of cash transfers and nutrition, with research characterising the effectiveness of cash transfers in terms of anthropometric measurements previously characterised as a critical gap. There have been calls to expand the evidence base for cash and nutrition, particularly given rapidly increasing use of cash transfers and the anticipated continuation of this trend as the result of the humanitarian Grand Bargain.[146] The World Health Organization commissioned a priority-setting exercise from 2016 to 2017 to define a research agenda for cash transfers in health and nutrition. The resulting research agenda defined nine research categories accompanied by a framework to understand their interdependence; research categories and questions are outlined and intended to serve as guidance for a wide range of actors. This guidance should be consulted when developing future research on cash in nutrition programmes to help ensure it aligns with practitioner needs and addresses evidence gaps.[147]

Recommendations for future nutrition research

Based on synthesis of recent peer-reviewed publications, gaps in the evidence base for nutrition research in humanitarian contexts that should be prioritised for future research include the following:

- The evidence base for effectiveness of nutrition interventions in humanitarian crises is diverse in terms of geographic location, crisis type/context, and both populations and interventions of focus. Most research on wasting in humanitarian settings originates in Africa; however, the overall burden of wasting is greater in Asia,[148] where there are also sizeable emergency-affected populations, suggesting a potential need to expand research in this area. However, it should also be noted that the evidence base from non-humanitarian contexts in Asia is large and should also be consulted.

- Wasting has been the primary topic of focus of humanitarian nutrition research and, given the association with increased morbidity and mortality, remains a justifiable focus area for continued research. While stunting is also important, much evidence has been generated from other low- and middle-income settings that can be applied in humanitarian settings and many wasting interventions address factors associated with stunting. The long follow-up period required for stunting outcomes may also be challenging to achieve in many humanitarian settings.

- In terms of specific interventions, previously identified evidence gaps that have not been well addressed by recent literature and should be **future research priorities include interventions to improve breastfeeding, breast milk substitutes, re-lactation, complementary feeding strategies, nutrition education and bundled and multi-sectoral interventions** (including cross-sectoral impacts such as nutrition outcomes of WASH programmes).

- Supplementary feeding and cash transfers were previously identified evidence gaps where a larger evidence based has recently emerged. Publication counts remain relatively limited for the range of intervention types within these areas. Cash transfers' impact on nutrition outcomes, in particular anthropometrics, is a priority given their rapidly increasing use in most humanitarian responses.

- With respect to programme implementation, previously identified **evidence gaps that persist include targeting of people with disabilities and older people, service delivery (specifically community case management), and monitoring and evaluation methodologies.**

- With respect to measurement and reporting in future research, **use of standard definitions and common nutrition outcome indicators, use of control/comparison groups and a focus on long-term effects of interventions should be prioritised** to better enable comparison of results across studies and an understanding of the longer-term benefits and effectiveness of interventions. Improving the quality of reporting would also enable quality appraisal and strengthen the nutrition evidence base.

7

Sexual and Reproductive Health and Gender-based Violence

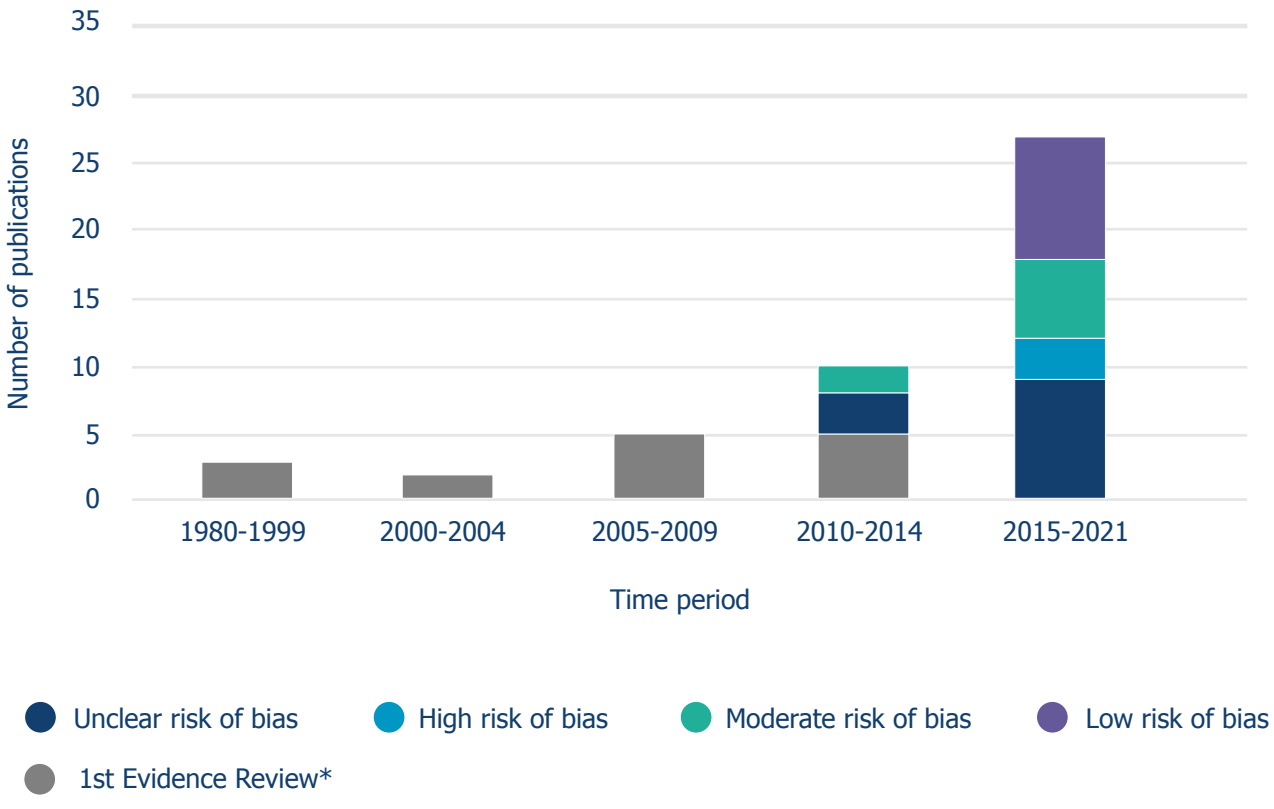
7. SEXUAL AND REPRODUCTIVE HEALTH AND GENDER-BASED VIOLENCE

32 Peer-reviewed publications in 8 years

Overview of literature search findings

Of the 269 peer-reviewed articles meeting eligibility criteria across all topic areas, 32 (12%) reported on SRH, including GBV. A detailed summary of included studies is presented in Annex 9. Five articles were published in 2013–2014, with eight published in 2015–2017 and 19 in 2018–2021. The number of SRH articles published in the past eight years was more than double that (n=15) included in HHER1, which spanned a 32-year period. This progression in publication volume is illustrated in Figure 7.1.

Figure 7.1 Quantity and quality of sexual and reproductive health publications over time



*Non-comparable quality appraisal was conducted in HHER1 (1980-2013).

Study designs and research quality

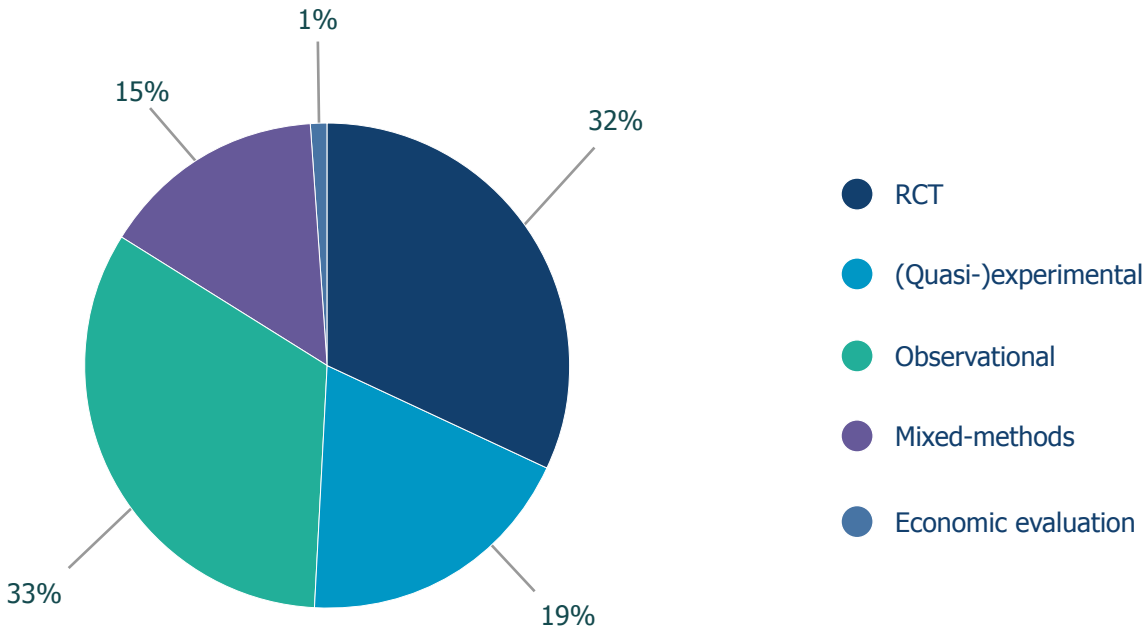
Included articles were categorised by study design and risk of bias was assessed accordingly for each article. A summary of study design and quality appraisal findings follows.

Study designs

The most common study design among articles reporting on SRH interventions was mixed-methods, with nine (28%) articles reporting findings from mixed-methods studies (Figure 7.2). Seven (22%) articles reported findings from RCTs and seven (22%) articles reported findings from observational studies. Among the observational studies, two reported on a pre-post evaluation, one reported on an interrupted time series and one reported on a cohort study. Six (19%) articles reported findings from quasi-experimental studies and three (9%) reported findings from economic evaluations.

The sample size in the studies ranged from 20 (mother-infant pairs to evaluate impact of a counselling intervention)[95] to 9,754 (pregnant women enrolled to evaluate cost-effectiveness of TORCH infection screening),[149] with 11 (34%) articles reporting on studies with sample sizes greater than 1,000 and an additional 16 (50%) with sample sizes greater than 100.

Figure 7.2 SRH research by type of study design

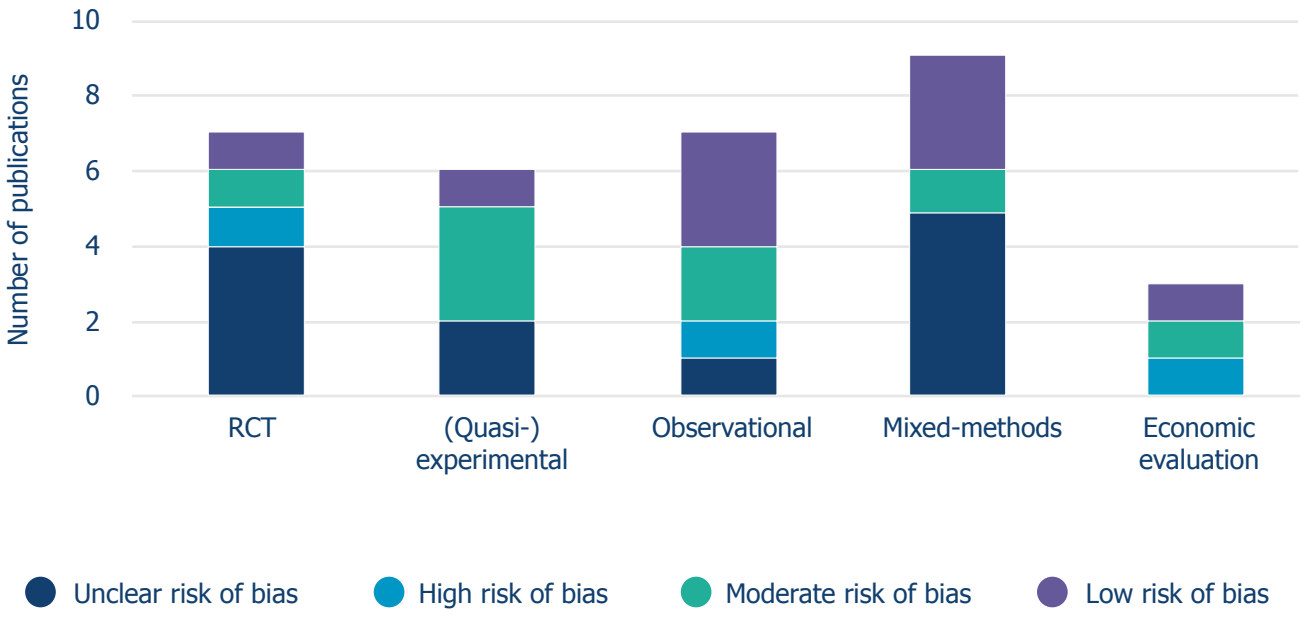


Quality appraisal

Twenty (63%) articles reporting on SRH interventions included sufficient information to make a judgement on the risk of bias. Nine (28%) articles were judged to have a low risk of bias, eight (25%) a moderate risk and three (9%) a high risk. The remaining 12 (38%) articles were determined to have an unclear risk of bias based on the information available in the article.

Risk of bias by study design is presented in Figure 7.3. Four of the seven articles reporting on RCTs had an unclear risk of bias, with one a low risk, one a moderate risk and one a high risk. Observational studies represented the highest proportion of studies with a low risk of bias (three of seven); and economic evaluation studies represented the highest proportion of studies with a high risk (one of three).

Figure 7.3 Risk of bias in SRH publications, by study design



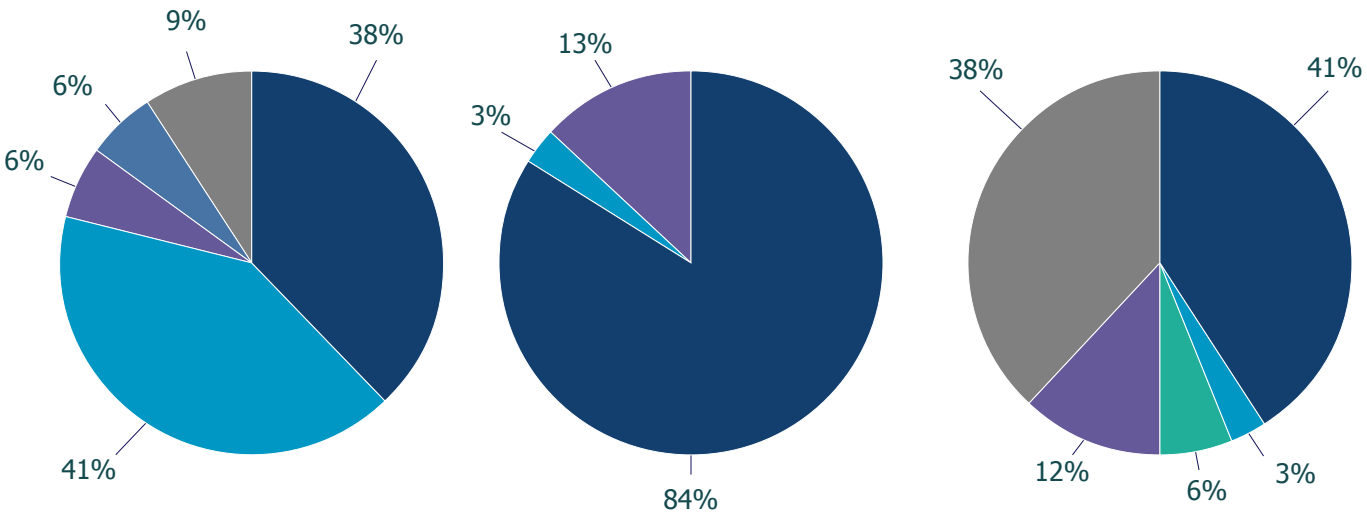
Research location, setting and population type

The location, setting and population type of study for SRH research in humanitarian contexts is summarised in Figure 7.4; a map of countries in which SRH research was conducted is provided in Annex 4. The largest proportion of articles reported on interventions in Asia, with 13 (41%) articles, followed by Africa with 12 (38%). Two (6%) articles reported on interventions in Latin America and the Caribbean and two (6%) reported on interventions in the Middle East; the remaining three (9%) articles reported on interventions implemented in study sites located in multiple regions. The majority of articles (n=27, 84%), reported on interventions in areas affected by armed conflict. One (3%) article reported on an intervention in an area affected by an environmental disaster and four (13%) reported on interventions in areas affected by multiple crisis types.

More than half of articles (n=18, 56%) reported on interventions occurring in rural areas. Nine (28%) articles reported on interventions occurring in urban areas; and four (13%) reported on interventions occurring in both urban and rural areas. Urban or rural setting was not clear in one (3%) article. Nearly two-thirds of articles (n=20, 63%) reported on interventions occurring in non-camp settings; three (9%) reported on interventions occurring in camp settings; and nine (28%) reported on interventions occurring in both camp and non-camp settings.

The largest proportion of articles reported on interventions for emergency-affected (non-displaced) populations, with 13 (41%) articles. Twelve (38%) articles reported on interventions for multiple population types. Four (13%) articles reported on interventions for refugee populations, two (6%) for IDPs and one (3%) for host communities.

Figure 7.4 Distribution of SRH publications by region, crisis and population

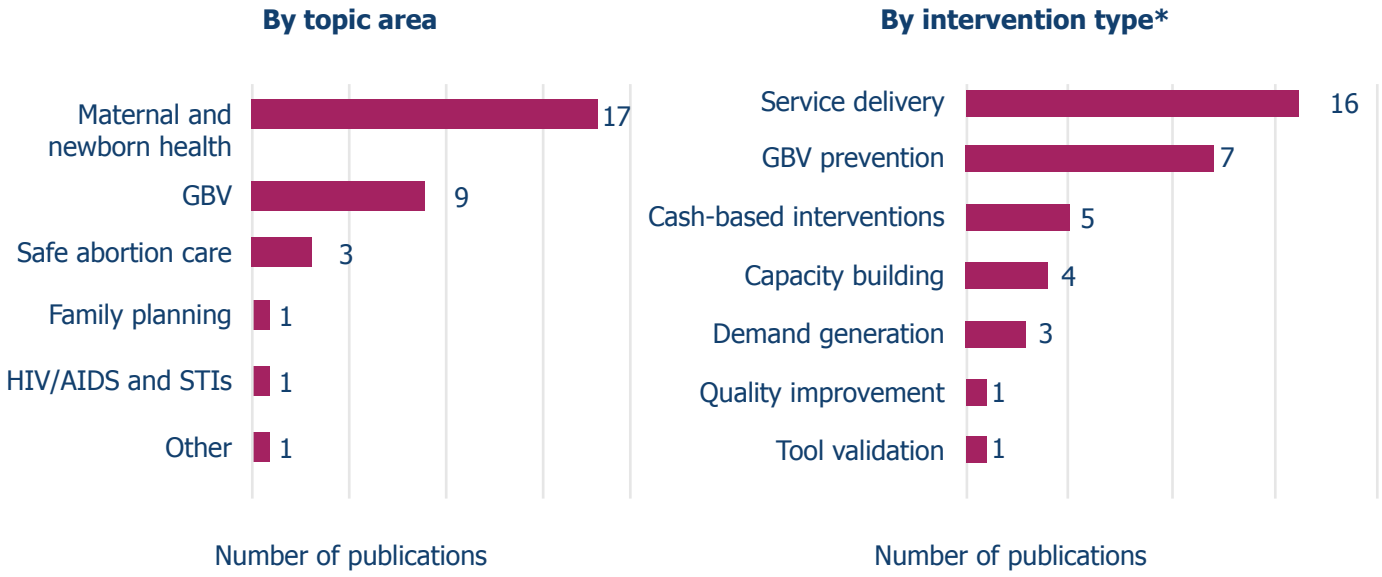


Topical areas and interventions of focus

Topical areas of focus

Figure 7.5 presents an overview of the distribution of topics and interventions across articles reporting on SRH interventions. Articles that reported on MNH interventions comprised approximately half (n=17, 53%) of the included SRH articles.[87,95,120,149–162] Articles reporting on GBV interventions comprised an additional nine (28%) articles,[163–171] three (9%) focused on safe abortion care,[172–174] one (3%) on family planning,[175] one (3%) on HIV/AIDS and sexually transmitted infections (STIs)[68] and one (3%) on polycystic ovarian syndrome.[176] One of the GBV interventions focused specifically on adolescents,[170] but no other articles focused exclusively on adolescent SRH interventions.

Figure 7.5 SRH research by topics and interventions of focus



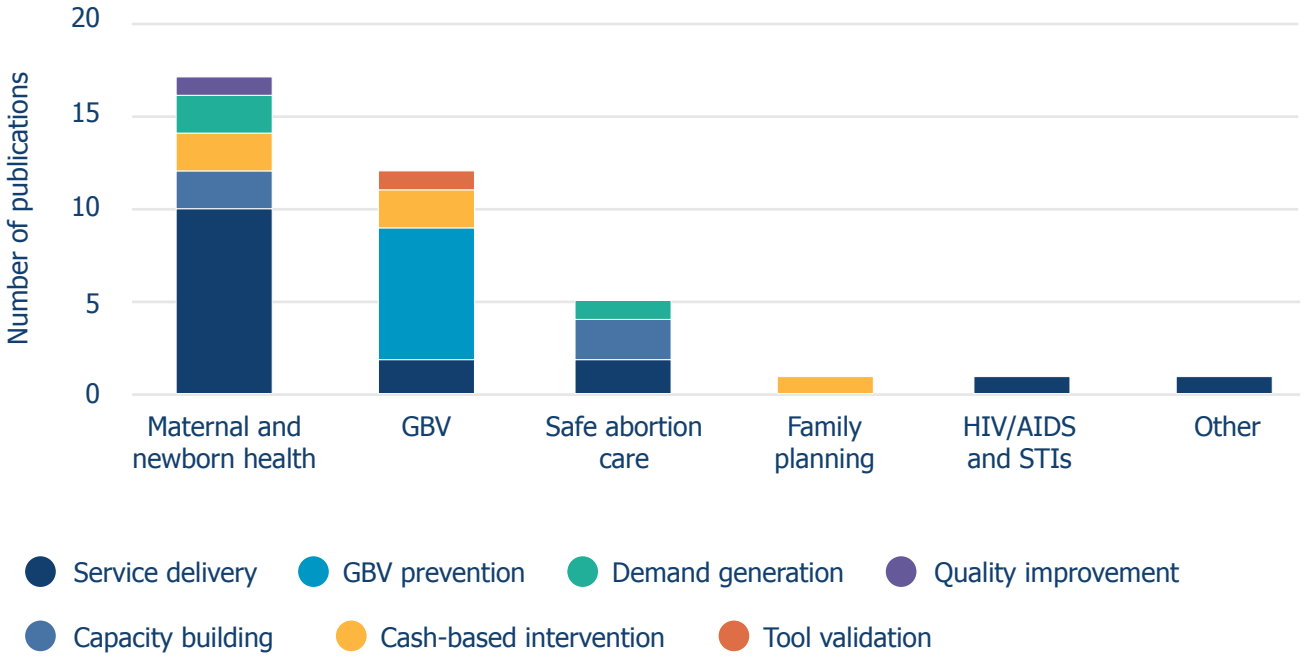
*Intervention type categories are not mutually exclusive.

Study settings and participant populations varied by topic area. Approximately two-thirds of the 17 MNH-focused publications (n=11, 65%) reported on interventions in Asia, while a similar proportion of the nine publications focused on GBV (n=6, 67%) reported on interventions in Africa. Twelve (71%) of 17 articles reporting on MNH interventions occurred in rural settings, as did five (56%) of nine articles on GBV interventions. Articles focused on safe abortion care and family planning evaluated interventions in both urban and rural settings. MNH and GBV articles reported on interventions serving displaced populations (MNH: n=4, 24%), non-displaced populations (MNH: n=6, 35%; GBV: n=6, 67%) and multiple population types (MNH: n=7, 41%; GBV: n=3, 33%). Given the small number of publications reporting on other SRH topic areas, additional trends in study setting and participant populations were difficult to discern.

Interventions of focus

Included articles reported on effectiveness of a wide range of interventions addressing SRH topics, including service-delivery interventions (n=16, 50%),[68,87,95,149,152–156,158,159,165,169,172,173,176] GBV prevention (n=7, 22%),[163–168,170] cash-based interventions (n=5, 16%),[120,157,163,164,175] capacity-building (n=4, 13%),[151,162,173,174] demand generation (n=3, 9%),[150,161,173] tool validation (n=1, 3%)[171] and quality improvement interventions (n=1, 3%).[160] A summary of the types of interventions evaluated in SRH research by topic area is provided in Figure 7.6.

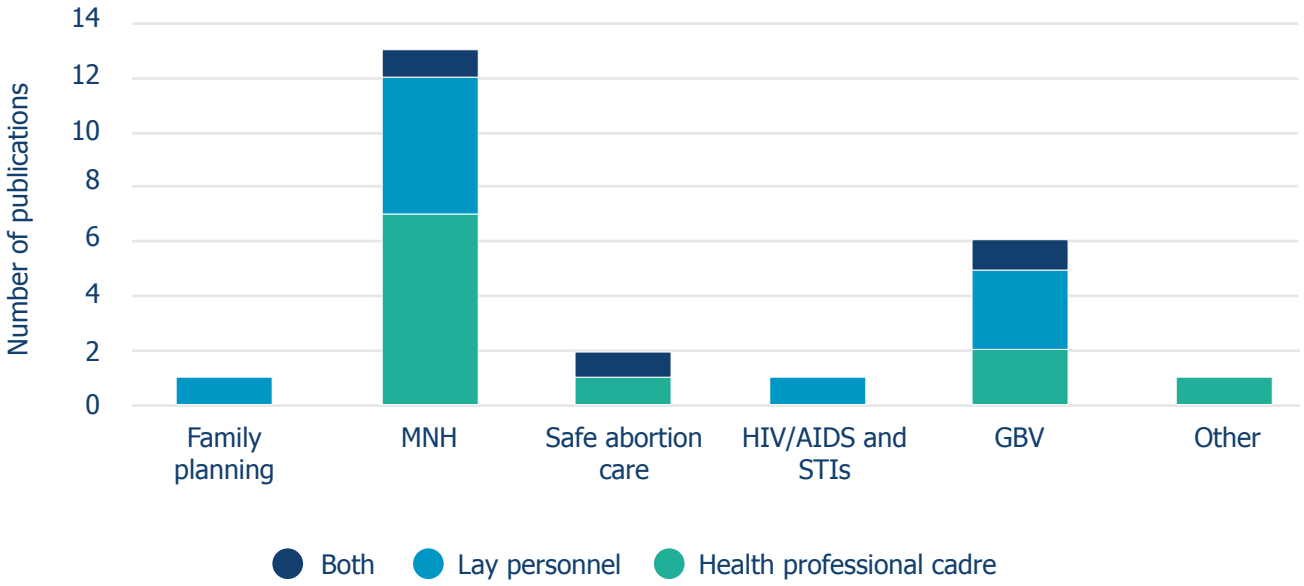
Figure 7.6 Interventions evaluated in SRH publications



The majority of articles (n=19, 59%) reported on community-based interventions. Seven articles (22%) reported on facility-based interventions (excluding pharmacies) and one (3%) reported on a pharmacy-based intervention. Two articles (6%) reported on system-level interventions and the remaining three (9%) reported on interventions with multiple types of implementation sites.

Approximately one-third of articles (n=11, 34%) reported on interventions implemented by a health professional cadre and a similar number of articles (n=10, 31%) reported on interventions implemented by lay personnel. Three articles (9%) reported on interventions implemented by both a health professional cadre and lay personnel. The remaining articles either did not specify the personnel type (n=6, 19%) or the intervention did not require a specific type of personnel (n=2, 6%). Specific health professional cadres and lay personnel types involved in interventions also varied from topic to topic. Health professional cadres involved in interventions included midwives, nurses, doctors, psychosocial assistants, pharmacists, vaccinators, social workers, skilled birth attendants and health workers without cadre specified. A range of lay personnel were cited as well: community health workers, NGO staff, gender champions, religious leaders, voucher distributors and trained community members. An overview of personnel involved in SRH interventions by topic area is presented in Figure 7.7.

Figure 7.7 Personnel involved in SRH interventions by topic area



Maternal and newborn health

Of the 17 articles reporting on MNH interventions, ten (59%) were service delivery-interventio ns,[87,95,149,152–156,158,159] two were capacity-strengthening interventions,[151,162] two were cash-based interventions,[120,158] two were demand generation interventions[150,161] and one was a quality improvement intervention[160] (the only quality improvement article on any SRH topic). No two studies evaluated the same, or similar, interventions.

The largest proportion of MNH articles (n=8, 47%) reported on community-based interventions. Six reported on facility-based interventions and one on a system-level intervention. The remaining two articles reported on interventions with multiple types of implementation sites. Community-based interventions included five examples of community-based service delivery, two cash-based interventions and one demand generation intervention. Four (50%) of these eight articles reported on interventions implemented by lay personnel, three by health professional cadre and one without need for specific personnel. The facility-based interventions evaluated included two capacity-strengthening initiatives and one quality improvement initiative, as well as service-delivery interventions that included screening for TORCH infections,[149] Hepatitis B virus prevention strategies[87] and emergency obstetric care provision.[154] The two articles reporting on interventions with multiple types of intervention sites focused on increased knowledge and utilisation of preconception folic acid,161 and increased maternal care services provided by both facility-based and mobile options.[157]

The majority of MNH articles (n=11, 65%) reported on stand-alone interventions, while six reported on interventions that were part of a broader multi-sector programme or intervention strategy.

Fourteen (82%) of the MNH articles reported on intervention effectiveness;[95,120,150–153,155–162] and three (18%) reported on cost and cost-effectiveness.[87,149,154] Outcomes of interest for experimental, quasi-experimental, observational and mixed-methods studies included provider knowledge (n=4,

24%),[151,160–162] clinical service provision or utilisation (n=11, 65%),[87,149,150,152,155–159,161,162] health outcomes (n=5, 29%),[87,151,155,160,162] patient knowledge (n=3, 18%),[150,153,158] and nutritional status or feeding practices (n=4, 24%).[95,120,151,158]

Only certain MNH articles reporting outcomes pertaining to clinical service provision/utilisation or feeding practices used similar indicators to measure intervention effectiveness. The number or proportion of women receiving antenatal care (measured as either >=one or >=three visits) was measured in five articles reporting on clinical service provision and utilisation.[150,152,156–158] The proportion of pregnant women specifically receiving a tetanus toxoid vaccine (measured as either one or three doses) was reported in two articles.[150,156] The proportion of women giving birth in a health facility was measured in seven articles reporting on clinical service provision and utilisation,[150,152,155–158,162] and the proportion of pregnant women with births attended by a skilled provider was reported in two articles.[152,158] The proportion of women receiving postnatal care (measured as >=one visit) was measured in four articles reporting on clinical service provision and utilisation.[150,156–158] Early initiation of breastfeeding was measured in two articles reporting on feeding practices[151,158] and duration of breastfeeding in three articles.[95,158]

Economic evaluations of MNH services reported on cost and cost-effectiveness of specific clinical services, including prenatal infectious disease screening,[149] confirmatory testing for maternal Hepatitis B infection[87] and caesarean sections.[154] No two studies examined the cost-effectiveness of the same clinical services.

Gender-based violence

Of the nine articles reporting on GBV interventions, seven (78%) focused on GBV prevention.[163–168,170] Two were service-delivery interventions,[165,169] two were cash-based interventions[163,164] and one reported on the validation of a GBV screening tool.[171] No two studies evaluated the same intervention.

The majority of GBV articles (n=8, 89%) reported on community-based interventions, with the remaining article reporting on a system-level intervention. Community-based interventions included seven examples of community-based GBV prevention interventions, two community-based service interventions and two cash-based interventions. Three (38%) of these eight articles reported on interventions implemented by lay personnel, one by a health professional cadre, and one by both lay personnel and a health professional cadre. The article reporting on a system-level intervention assessed validation of a screening tool that aimed to strengthen early identification of GBV survivors.[171]

The majority of GBV articles (n=5, 56%) reported on stand-alone interventions, while four reported on interventions that were part of a broader multi-sector programme or intervention strategy. Six (67%) GBV articles reported findings from RCTs (accounting for all but one of the RCTs on any SRH topic). Two (22%) articles reported findings from mixed-methods studies and one (11%) from an observational study. All nine of the GBV articles reported on intervention effectiveness. Outcomes of interest for experimental, observational and mixed-methods studies included cultural norms (n=7, 78%),[164–170] GBV experiences (n=6, 67%),[163,164,166–168,170] mental health outcomes (n=3, 33%)[163,164,169] and tool validation metrics (n=1, 11%).[171]

Some GBV articles reporting outcomes pertaining to cultural norms, GBV experiences and women's mental health used similar indicators to measure intervention effectiveness. The belief in a husband's right to use violence, alternatively framed as 'justification for wife beating', was measured in two articles.[165,166] Gender attitudes were measured in two articles, with one reporting with a locally developed scale[164] and the other with a scale adapted from multiple sources.[168] Ability of women to refuse sex was measured in two articles, with one measuring the female perspective[166] and one measuring the male perspective.[167] Stigma related to GBV was measured in three articles, each using different scales.[165,168,169] The number or proportion of women who had experienced intimate partner violence (IPV) in the past 12 months was measured in four articles, with all four reporting on occurrence of physical IPV.[164,166–168] Three measured sexual IPV,[166–168] two emotional IPV,[164,168] two physical and/or sexual IPV[166,167] and one any form of IPV.[168] While exact wording varied, all four articles assessed IPV by querying women about their experience of a set of specific actions and all considered any one such experience in the past 12 months to be an experience of IPV. Life satisfaction was measured in two articles, each using different scales.[163,164] Depressive symptoms were also measured in two articles, again using different scales.[164,169]

Safe abortion care and family planning

Three articles reported on safe abortion care (SAC) interventions and one reported on a family planning (FP) intervention. Of these four articles, two reported on service-delivery interventions,[172,173] two on capacity-strengthening interventions[173,174] one on a demand generation intervention (a service approach based on the Essential Elements of Postabortion Care model that incorporated community mobilisation)[173] and one on a cash-based intervention (a voucher programme to subsidise long-acting reversible contraceptives and permanent methods of family planning).[175] No two studies evaluated the same, or similar, interventions. None of the SAC and FP articles described interventions as part of broader SRH interventions or humanitarian response initiatives.

Two SAC and FP articles reported on community-based interventions, with one reporting on a facility-based intervention and one reporting on an intervention with multiple implementing sites (community-based and facility-based). One article reported on an intervention implemented by a health professional cadre, one by lay personnel, and one by both a health professional cadre and lay personnel; the fourth article did not specify the implementing personnel type.

All four of the SAC and FP articles reported on intervention effectiveness. Three (75%) articles reported findings from mixed-methods studies and the remaining article reported findings from an observational study. Outcomes of interest included contraception and abortion service provision (n=2, 50%),[173,175] provider knowledge (n=1, 25%)[174] and health outcomes (n=1, 25%).[172] Two articles, one focused on SAC and one on FP, reported on service provision using similar indicators to measure intervention effectiveness.[173,175] Both reported the proportion of women selecting various types of contraception, one specifically in the context of post-abortion care.

HIV/AIDS and sexually transmitted infections

One article reported on an HIV/AIDS and STI service-delivery intervention.[68] This quasi-experimental study was the only article reporting on an SRH intervention specific to an environmental disaster context (post-earthquake Haiti). It reported on a stand-alone community-based intervention implemented by lay personnel. Outcomes of interest included client knowledge of HIV and STIs, condom use, social support, depressive symptoms, resilient coping and relationship control.

Other

One article reported on a service-delivery intervention focused on women with polycystic ovarian syndrome.[176] This RCT evaluated a stand-alone pharmacy-based intervention implemented by a health professional cadre. This was the only SRH article reporting on an intervention that was pharmacy-based and which cited outcomes of interest focused on patient quality of life.

Cumulative summary of recent SRH publications

Together, HHER1[2] and HHER2 identified 47 articles published between 1980 and April 2021 that report on the effectiveness and/or costs of SRH interventions in humanitarian settings. Comparison of articles included in HHER1 and HHER2 suggested an increase in both volume and diversity of findings in recent years.

Changes in research between the review periods

Key differences in the studies included in both evidence reviews are presented in Figure 7.8. HHER1 identified 15 SRH articles across 32 years, while HHER2 found twice as many articles in a third of that time. Nearly all articles in HHER1 were observational, with just one article having an experimental or quasi-experimental study design. HHER2 saw a shift towards experimental and quasi-experimental study designs, comprising over a third of the articles.

Figure 7.8 Comparison of SRH research across evidence reviews

Study design and quality	HHER1 (1980–2013) 15 articles	HHER2 (2013–2021) 32 articles
Study design		
Experimental	1	7
Quasi-experimental	-	6
Observational	**13**	7
Mixed-methods	-	**9**
Economic evaluation	1	3
Study quality		
Low risk of bias	Comparable quality assessment not completed in HHER1.	9
Moderate risk of bias		8
High risk of bias		3
Unclear risk of bias		**12**
Study characteristics		
Region		
Africa	**9**	12
Asia	6	**13**
Latin America/Caribbean	-	2
Middle East	-	2
Europe	-	-
Mulltiple	-	3
Crisis type		
Armed conflict	**14**	**27**
Environmental disaster	1	1
Outbreak	-	-
Multiple	-	4
Population type		
Refugee	**5**	4

Internally displaced	2	2
General population	4	**14**
Multiple	3	12
Study topics and interventions		
Topic area		
MNH	**9**	**17**
GBV	-	9
SAC	-	3
FP	2	1
HIV/STI	4	1
Other	-	1
Intervention type		
Service delivery	6	**16**
Capacity strengthening	**8**	4
GBV prevention	-	7
Cash-based intervention	-	5
Demand generation	1	3
Quality improvement	-	1
Tool validation	-	1

All articles in HHER1 reported on interventions in Africa or Asia. While the majority of articles in HHER2 still reported on interventions in those regions, interventions in Latin America and the Caribbean and the Middle East were also represented. The vast majority of articles in HHER1 focused on interventions in areas affected by armed conflict and this remained true in HHER2. Interventions focused on refugee populations were the most prevalent in HHER1, while HHER2 saw a shift towards interventions that focused on the general population/emergency-affected (non-displaced) populations and on multiple population types.

The majority of articles in HHER1 assessed interventions focused on MNH, and this remained true in HHER2. However, while only FP and HIV/STIs were represented in addition to MNH in HHER1, the breadth of studies expanded to include GBV and SAC in HHER2. It is worth noting that HHER1 considered mental health interventions for survivors of GBV within the MHPSS section rather than the SRH section, whereas HHER2 included such studies in both sections.

The majority of articles in HHER1 assessed capacity-strengthening interventions, with service delivery-interventions also well represented and one article assessing a demand-generation intervention. The most frequent intervention type in HHER2 shifted to service delivery. HHER2 also saw a diversification of intervention types, with GBV prevention, capacity strengthening, cash-based interventions, demand generation, quality improvement and tool validation all also represented.

HHER1 commented on several gaps in the evidence base, noting the need for research in topic areas other than MNH, particularly GBV interventions, as well as the need for high-quality SRH studies. HHER2 found assessments of GBV interventions to be the second most commonly occurring, a significant shift in focus within SRH research. Articles assessing MNH interventions comprised 53% of the articles included in HHER2, a slight decrease from the 60% in HHER1.

The journal publication reporting SRH findings from HHER1 provided additional commentary regarding gaps in the evidence base.[7] Warren et al. (2015) identified studies assessing provision of or access to FP as a gap and just two studies in HHER2 looked specifically at interventions providing FP (one specifically in the context of SAC). Evidence on scaling up service delivery and cost or cost-effectiveness of SRH interventions was also highlighted as needing a larger evidence base. HHER2 saw a shift towards evaluation of service-delivery interventions, with capacity-strengthening interventions appearing with lower frequency than in HHER1. Fourteen of the articles in HHER2 also met criteria for inclusion in the Health Service Delivery review and eight met criteria for inclusion in the Health Systems review. HHER1 included one economic evaluation, while HHER2 saw an increase to three.

SRH evidence gaps

Since HHER1 was conducted, at least six additional systematic reviews of SRH interventions in humanitarian settings have been published. Two also focused on evidence of effectiveness of SRH interventions,[177,178] one focused on evidence of utilisation of SRH services[179] and one focused on SRH services for adolescents.[180] The final two reviews (one on MNH and the other on non-MNH SRH interventions) focused on SRH service delivery strategies.[181,182] The two reviews focused on effectiveness of SRH interventions both noted the need for additional evidence on effectiveness of GBV, SAC and adolescent SRH interventions. Casey et al. (2019)[177] also noted the limited evidence on effectiveness of FP interventions in humanitarian settings, and Singh et al. (2018b)[179] noted the lack of studies evaluating interventions to address vaginal injury and fistula. The review focused on utilisation of SRH services also highlighted the absence of studies evaluating the Minimum Initial Services Package (MISP) for Reproductive Health in Crises as an intervention package.[179] Reviews focused on service delivery-models noted that while several studies referenced the MISP, information on how MISP components were implemented and data on the effectiveness of service-delivery strategies was sparse.[181,182] While HHER2 found a relative increase in attention given to some of these topics, the heterogeneity of studies of SRH intervention effectiveness and common gaps identified across reviews of intervention effectiveness, service delivery models and utilisation suggest that more focused high-quality research is needed.

Two research prioritisation exercises conducted in 2018 affirmed academic and humanitarian health practitioner recognition of the need for continued investments in SRH research in humanitarian settings, with a focus on implementation research that goes beyond evaluation of intervention

effectiveness to explore what works where, why and how.[183,184] Specific priorities included testing MNH and FP service delivery strategies (including task shifting, models of community- and facility-based care, and self-care interventions); SRH quality improvement strategies (including but not limited to health worker capacity strengthening and surveillance/data use initiatives); integration of MHPSS into SRH programming; and supporting transition from MISP implementation towards comprehensive SRH programming.[183,184]

HHER2 found few studies that address any of these priorities; and none examining similar intervention approaches in distinct settings to evaluate the feasibility or effectiveness of SRH intervention strategies in different operating environments.

Recommendations for future SRH research

Based on a synthesis of recent peer-reviewed publications, gaps in the evidence base for SRH research in humanitarian contexts that should be prioritised for future research include the following:

- Given the limited volume of research on some SRH services (e.g. FP, SAC, HIV and STIs) compared to others (MNH, GBV) and on the effectiveness of interventions addressing multiple SRH topic areas, there is a need to expand research on service delivery strategies for multi-faceted packages of care, with a focus on research questions highlighted in recent consensus-based prioritisation exercises.

- Few SRH studies measure intervention effectiveness in terms of both coverage and quality of care provided to crisis-affected populations. More consistent assessment of SRH service quality and use of common frameworks and metrics for evaluation could enhance the impact of SRH research for programme planning.

- Well-coordinated replication studies and implementation research are needed to address gaps in evidence on the effectiveness of SRH service delivery strategies across diverse population groups and humanitarian settings.

8

Mental Health and Psychosocial Support

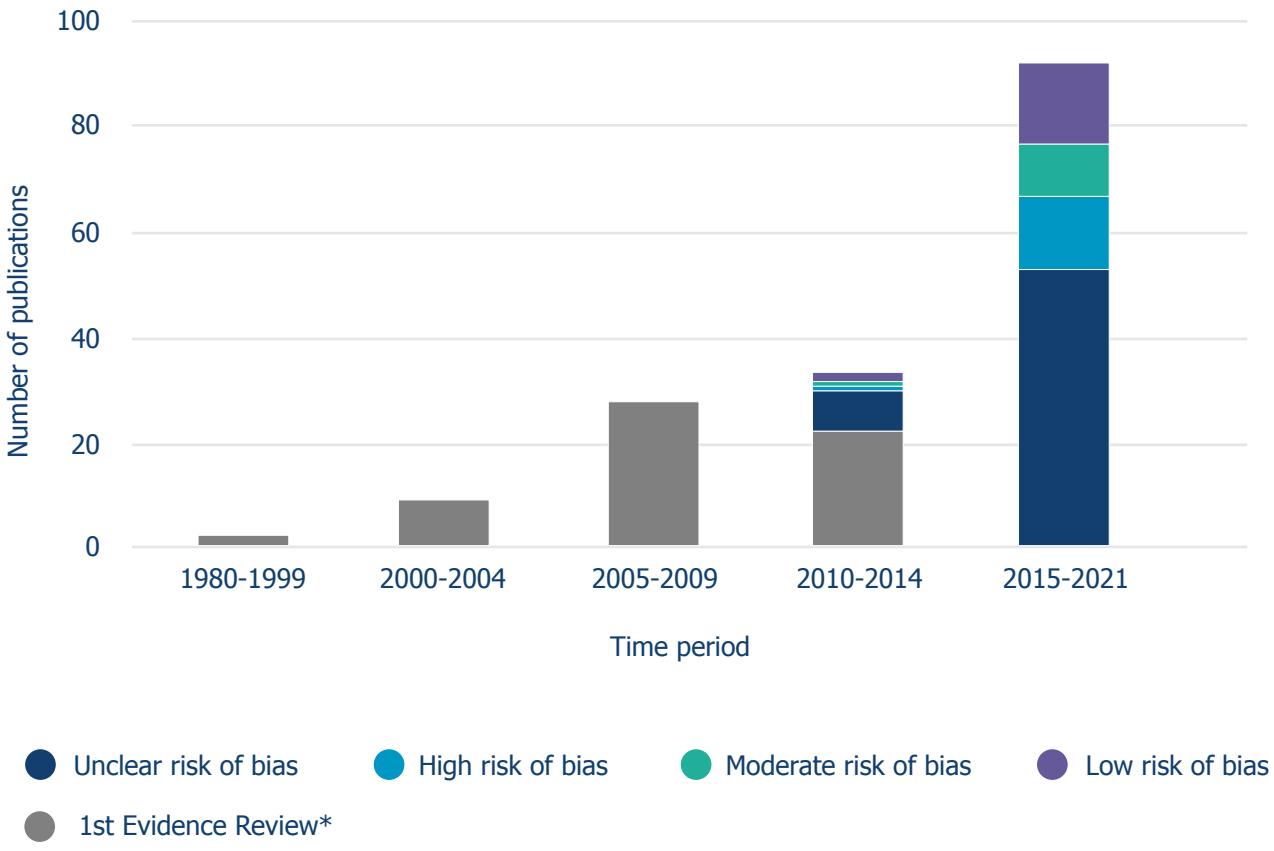
8. MENTAL HEALTH AND PSYCHOSOCIAL SUPPORT

104 Peer-reviewed publications in 8 years

Overview of literature search findings

Of the 269 peer-reviewed articles meeting eligibility criteria across all topic areas, 104 (39%) reported on MHPSS. The 104 peer-reviewed articles present findings from 102 unique studies; a detailed summary of included studies is presented in Annex 10. Between 2014 and 2017, 41 articles were published; and between 2018 and April 2021, 66 articles on MHPSS were published, demonstrating a substantial increase in publications in recent years. The number of MHPSS articles published in the past eight years was 1.7 times greater than those included in HHER1, which spanned a 32-year period. This progression in publication volume is illustrated in Figure 8.1.

Figure 8.1 Quantity and quality of MHPSS publications over time



*Non-comparable quality appraisal was conducted in HHER1 (1980-2013).

Study designs and research quality

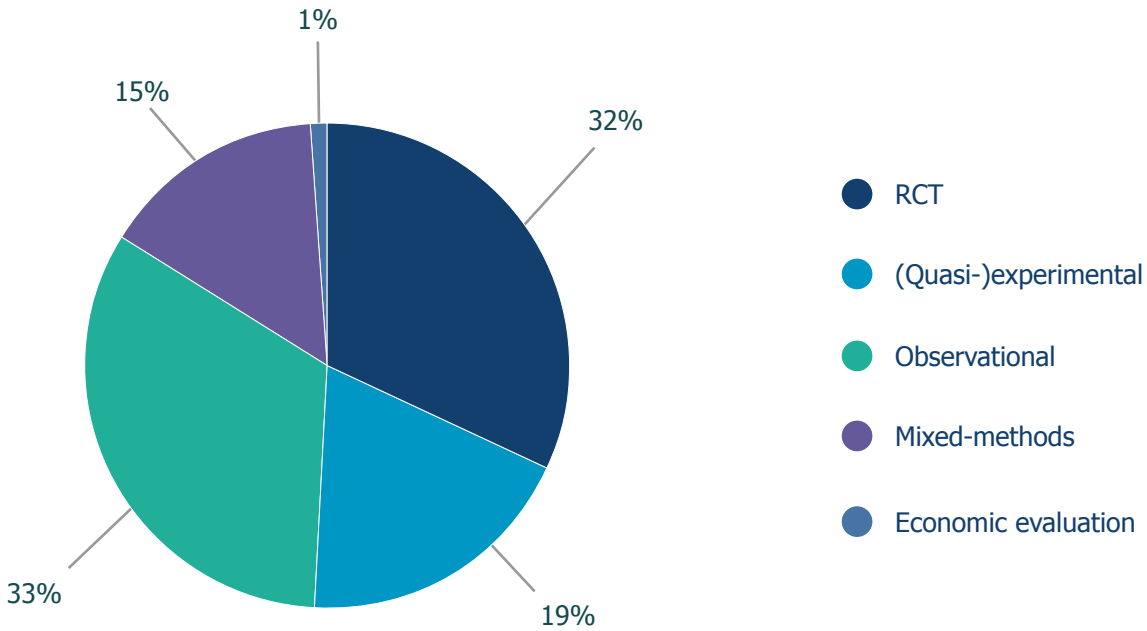
Included articles were categorised by study design and risk of bias was assessed accordingly for each article. A summary of study design and quality appraisal findings follows.

Study designs

Experimental and quasi-experimental studies accounted for 53 (51%) included articles, while observational and mixed-methods studies accounted for 50 (48%) and economic evaluations one (1%) (Figure 8.2). The most common study designs were observational designs and RCTs, with 34 (33%) and 33 (32%) articles, respectively. Quasi-experimental designs were used in 20 (19%) articles. Sixteen (15%) articles were for mixed-methods studies and the remaining article was an economic evaluation. Before/after observational studies and RCTs contributed to the majority of study designs.

Sample size ranged from 11 (camp residents who had experienced sexual violence to evaluate transcendental meditation intervention)[185] to 4,799 (individuals who received a trauma stabilisation therapy intervention);[186,187] 24 (23%) of the 104 studies had a sample size greater than 500 subjects and 31 (30%) studies had a sample size smaller than 100 subjects.

Figure 8.2 MHPSS research by type of study design

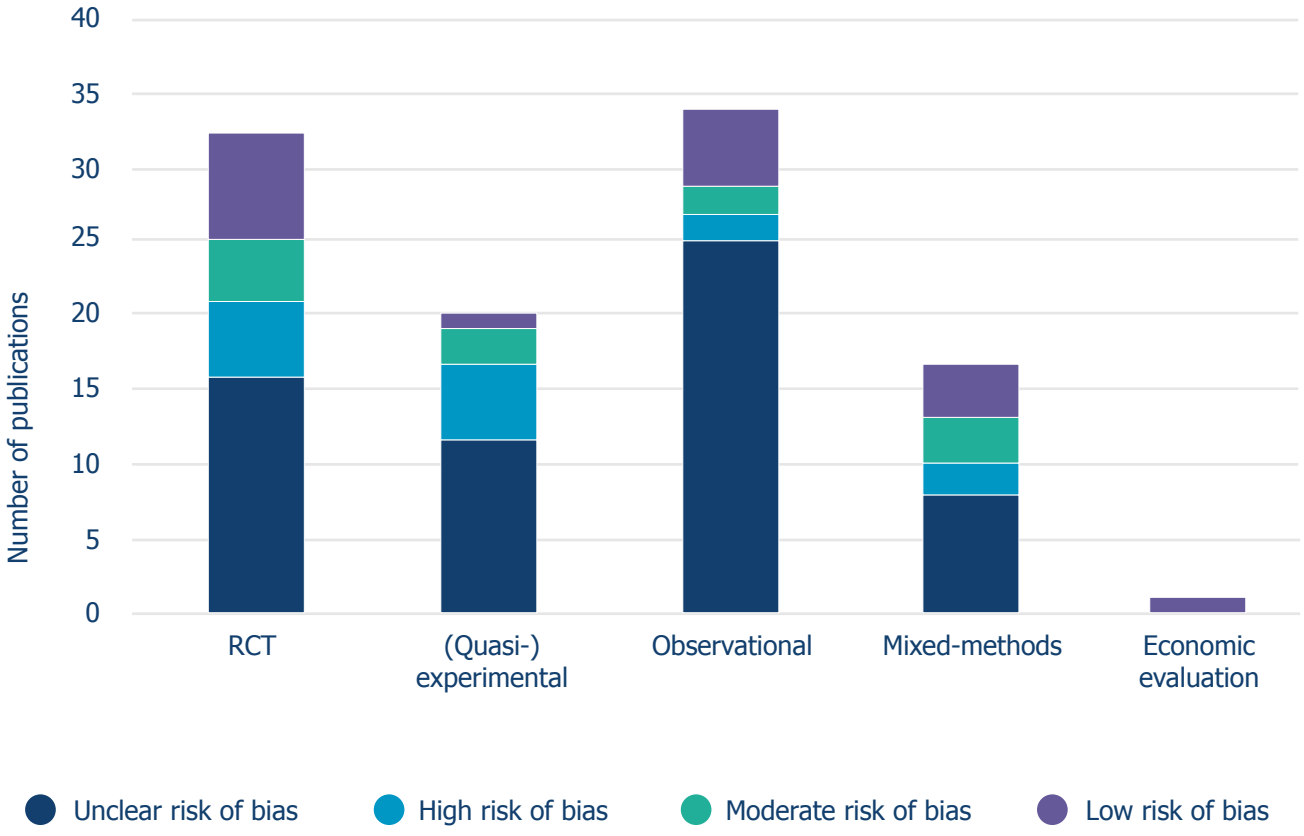


Quality appraisal

Forty-three (41%) articles reporting on MHPSS interventions included sufficient information to make a judgement on risk of bias. Eighteen (17%) articles were judged to have a low risk of bias for their study design, 11 (11%) a moderate risk and 14 (13%) a high risk. The remaining 61 (59%) articles were classified as having an unclear risk of bias.

Risk of bias by study design is presented in Figure 8.3. While 16 of the 33 articles reporting on RCTs had an unclear risk of bias, RCTs also demonstrated the largest proportion of articles with a low risk of bias (24%). Quasi-experimental studies had the highest proportion of articles with a high risk of bias, with five of 20 (25%) articles. Twenty-five of the 34 (74%) articles reporting on observational studies were classified as having an unclear risk of bias; however, observational studies also had the smallest proportion of articles with a high risk, with two of the 34 (6%) articles.

Figure 8.3 Risk of bias in MHPSS publications, by study design

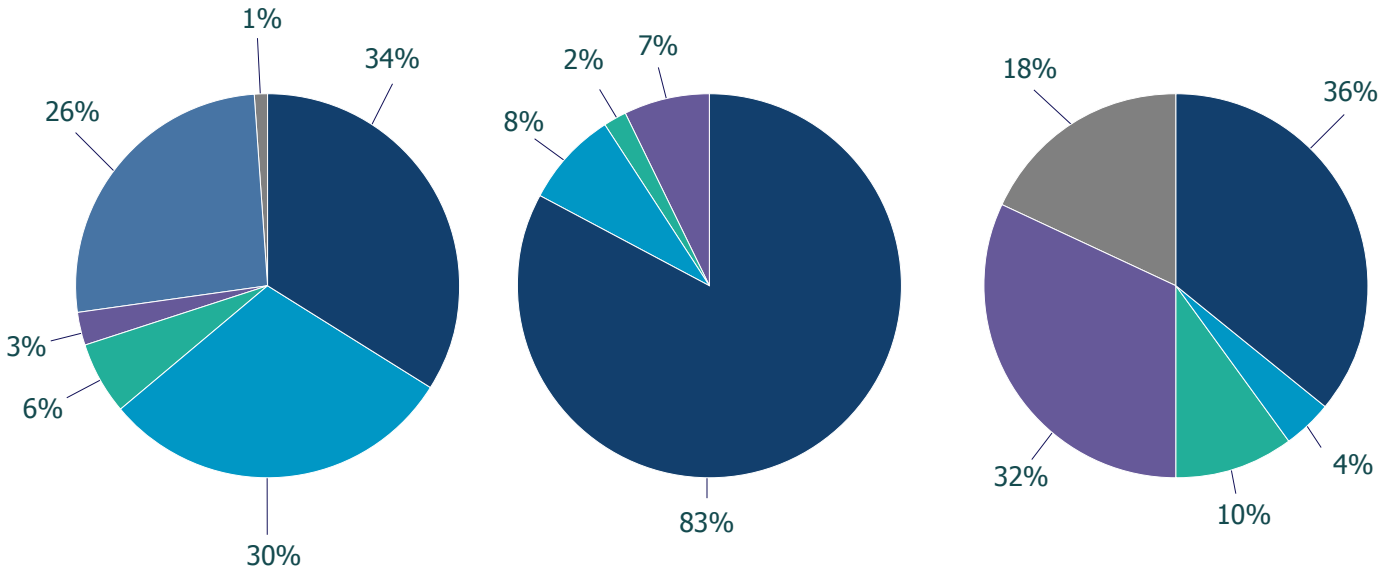


Research location, setting and population type

The location, setting and population type of study for MHPSS research in humanitarian contexts is summarised in Figure 8.4; a map of countries in which MHPSS research was conducted is provided in Annex 4. The majority of MHPSS articles reported on interventions in Africa, with 36 (35%) articles, and Asia, with 31 (30%) articles. Twenty-seven (25%) articles reported on interventions in the Middle East and six (6%) reported on interventions in Europe, with the remaining three (3%) evaluating interventions implemented in Latin America and the Caribbean. One article reported on an intervention implemented in multiple regions (Africa, Asia and the Middle East). Publications reporting on armed conflict contexts accounted for 84% (n=86) of included MHPSS articles. Nine (9%) articles reported on interventions following environmental disasters and two (2%) during disease outbreaks. Seven (7%) articles evaluated interventions in areas affected by multiple types of crises.

Thirty-seven (36%) of the 104 MHPSS publications reported on interventions for emergency-affected (non-displaced) populations, 33 (32%) on interventions for refugees and 11 (11%) on interventions for IDPs. Nineteen (18%) articles reported on interventions for multiple population types and four (4%) addressed interventions among emergency-affected (non-displaced) populations and host country nationals. The largest proportion of articles (n=36, 35%) reported on interventions occurring in urban areas, compared to seventeen (16%) articles that reported on interventions in rural areas. Twenty-seven (26%) articles reported on interventions occurring in camps. Eleven (11%) publications reported interventions that took place in non-camp settings but did not specify beyond that. For 12 articles (11%), it was unclear whether the study took place in urban, rural, camp or non-camp settings, while nine (9%) of the included publications reported on interventions in multiple types of settings.

Figure 8.4 Distribution of MHPSS publications by region, crisis and population



By region

- Africa
- Asia
- Europe
- Latin America and Caribbean
- Middle East
- Multiple regions

By crisis type

- Armed conflict
- Environmental disaster
- Outbreak
- Multiple crises

By population type

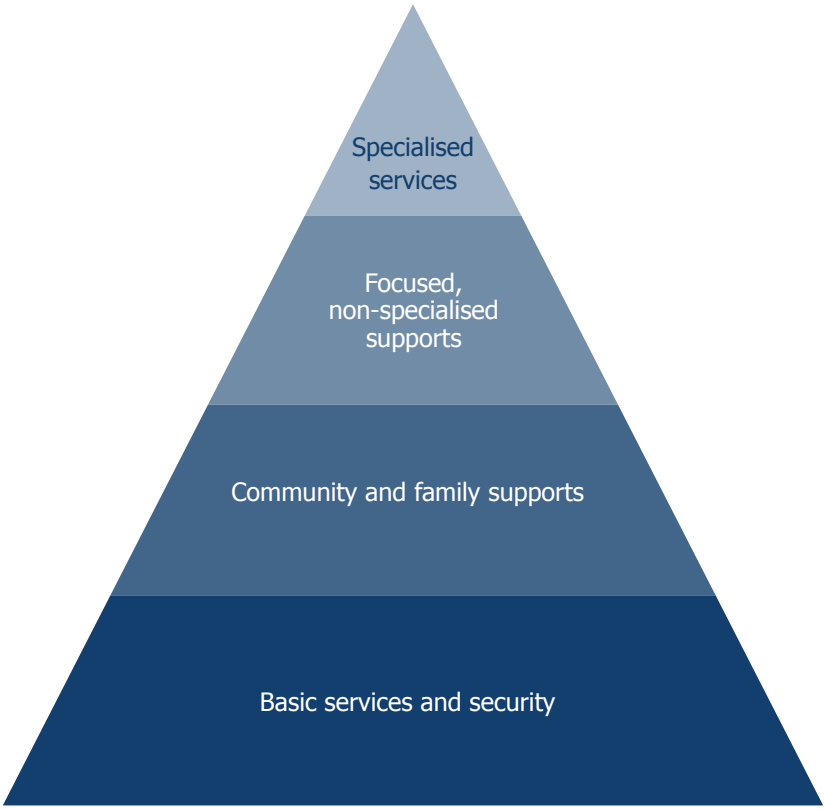
- Affected(non-displaced)
- Host community
- Internally displaced
- Refugee
- Multiple populations

Topical areas and interventions of focus

Topical areas of focus

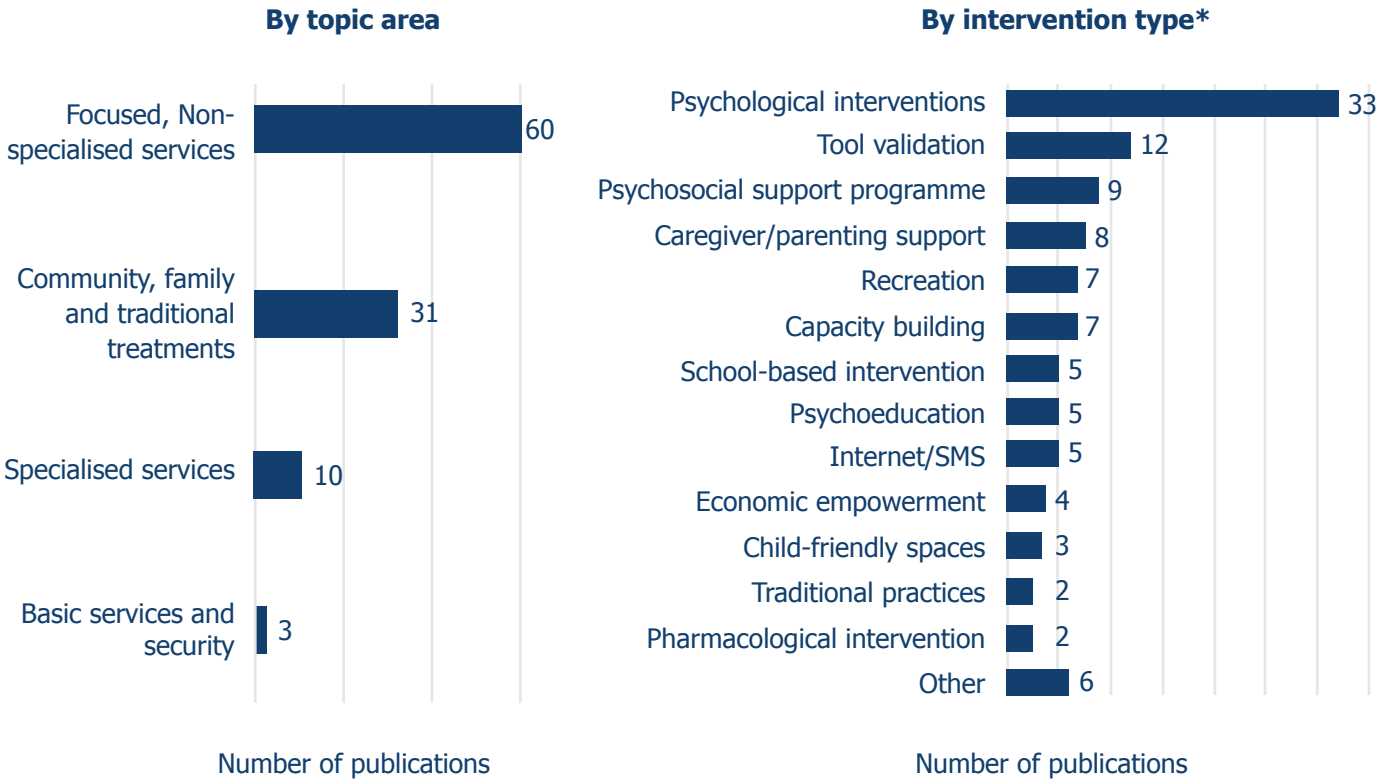
MHPSS approaches and interventions for crisis-affected populations can range from embedding social and cultural considerations into basic services to providing specialised services for individuals with more complex mental health concerns. The Inter-Agency Standing Committee (IASC) presents MHPSS approaches as a layered system of complementary support needed to meet the range of MHPSS needs of different groups at every phase of a humanitarian crisis[188] (Figure 8.5). Differentiating between specialised and non-specialised services (the top two layers in the IASC pyramid) is not a perfect science. In this review, articles on interventions provided by clinical specialists or involving pharmacological interventions were classified as specialised services, while those provided by health professionals or lay personnel with less specialised training were classified as focused, non-specialised support. Where levels of care or qualifications of health personnel were not mentioned, articles were classified with others reporting on similar interventions. Articles that evaluated basic services and security interventions account for three (3%) of the MHPSS articles.[189–191] Articles that evaluated community, family and traditional support interventions accounted for 31 (30%);[126,153,164,185,192–218] and articles that evaluated focused, non-specialised services interventions accounted for 60 (58%) of the included MHPSS articles.[68,88,159,169,187,219–273] Ten (10%) articles assessed specialised service interventions.[186,274–282] Figure 8.6 presents an overview of the distribution of topics and interventions across articles reporting on MHPSS.

Figure 8.5 IASC MHPSS in emergencies intervention pyramid



*Intervention type categories are not mutually exclusive

Figure 8.6 MHPSS research by topics and interventions of focus

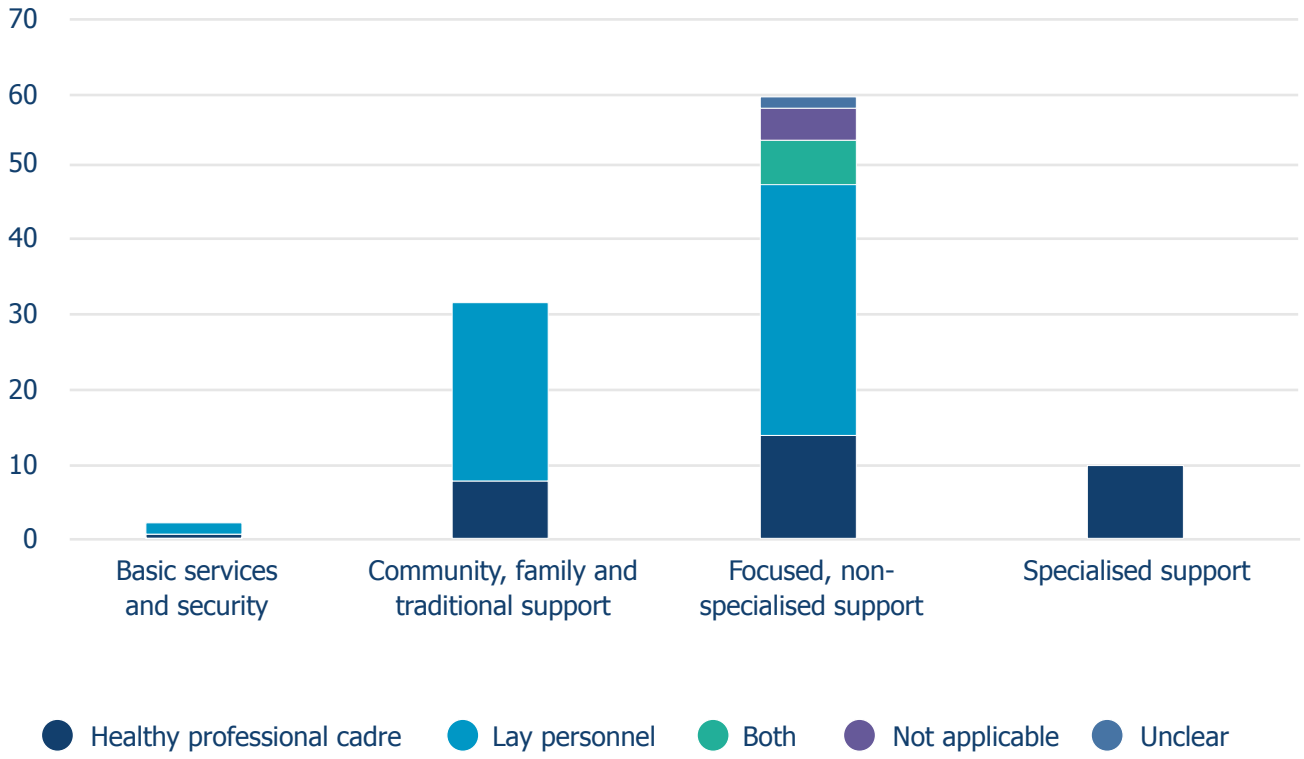


The distribution of geographic regions and population types differed for each topic area. All three basic services and security publications reported on interventions in the Middle East. Of the 31 publications on community, family and traditional support interventions, the majority reported on studies in the Middle East (n=13, 42%) and Africa (n=11, 35%). Four (13%) articles reported on studies in Asia (Bangladesh, Nepal and the Philippines), two (6%) in Europe (Greece and Ukraine), and one (3%) reported on an intervention implemented in multiple countries in Africa, the Middle East and Asia (Ethiopia, Uganda, Iraq, Jordan and Nepal). Of the 60 articles on focused, non-specialised interventions, the largest proportion of articles (n=20, 33%) reported on interventions primarily serving emergency-affected (non-displaced) populations in Africa and Asia; 11 (19%) articles evaluating focused, non-specialised interventions reported on studies in the Middle East, six of which served both host and refugee communities. Four (40%) of the ten publications reporting on specialised services evaluated interventions for refugee populations in the Middle East, and four evaluated interventions for IDPs or emergency-affected (non-displaced) populations in Asia. Publications in Europe and Latin America were fewer, with one article evaluating an intervention for Syrian refugees in Greece and the other for conflict-affected (non-displaced) people in Colombia.

Sixty-five articles reported on interventions involving lay personnel (63%); 39 (38%) on interventions facilitated by healthcare professionals; and in six (6%) articles personnel type was either categorised as unclear or was not applicable as the intervention focused on screening tool evaluation. Health professional cadres included clinical psychologists, psychiatrists, psychotherapists, doctors, nurses, pharmacists, physician assistants, social workers, counsellors, psychosocial workers and those described as "mental health professionals"'. Lay personnel included community health workers, community health volunteers, community counsellors and teachers. Unless authors

specified that community-based personnel were a specific professional cadre, they were generally classified as lay personnel (see Annex 10 for study-specific classifications). The variation in personnel providing MHPSS interventions evaluated at each level of the IASC pyramid is presented in Figure 8.7. Apart from articles evaluating specialised services, at least a quarter of articles at each level of the pyramid involved lay personnel or both lay personnel and health professionals.

Figure 8.7 Personnel involved in MHPSS interventions evaluated by IASC pyramid categorisation



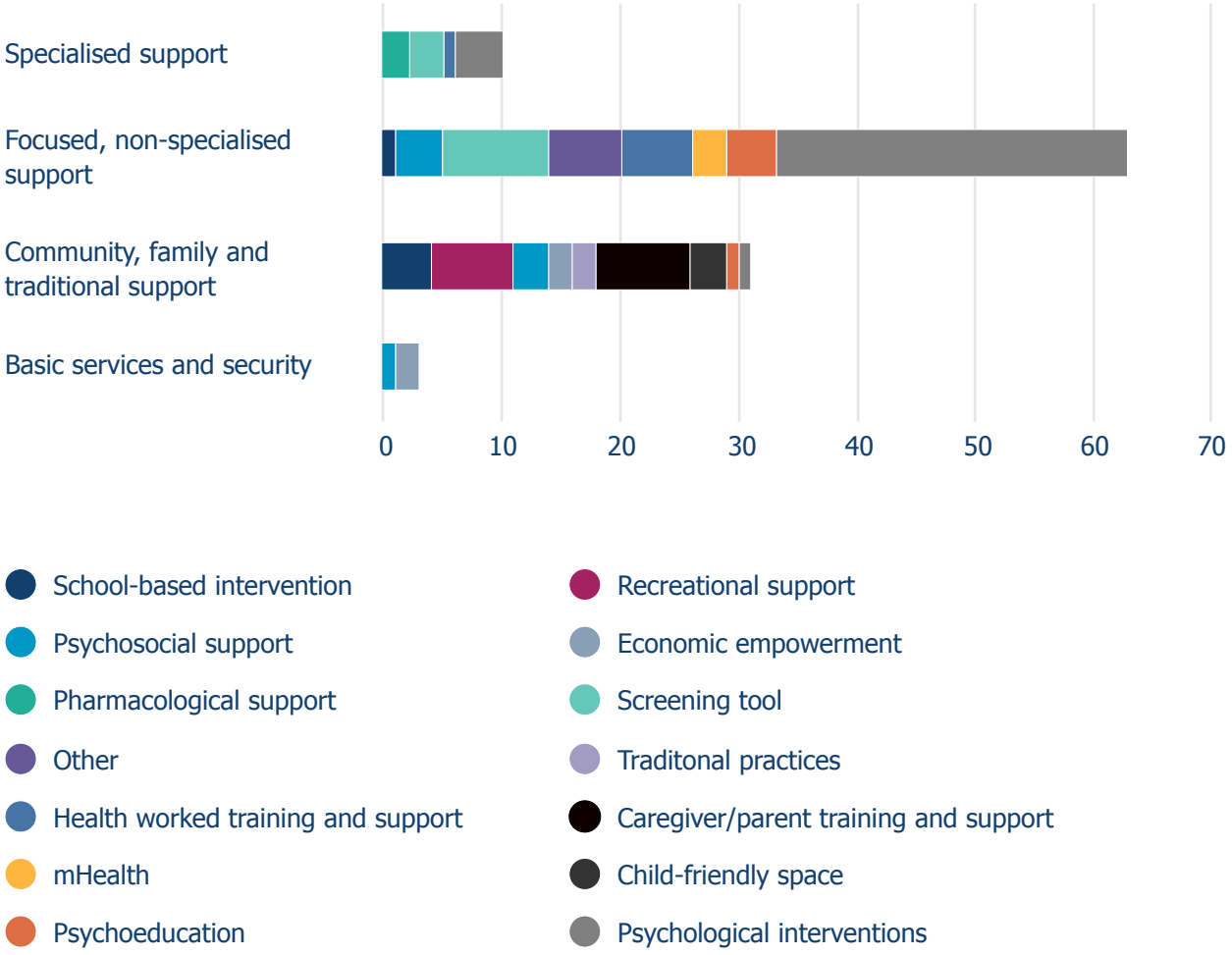
Experimental and quasi-experimental studies contributed a notable proportion of studies at each level of the IASC pyramid. One (33%) of three basic services and security articles, 18 (58%) of 31 community and family support articles, 28 (47%) of 60 focused, non-specialised support articles and all articles on specialised services reported on RCTs or quasi-experimental studies. Only one stand-alone economic evaluation (1%) was included from a focused, non-specialised youth behavioural intervention. However, two of the basic services and security articles, four of the community and family support articles and ten of the focused non-specialised support articles reported on mixed-methods studies, some of which involved economic evaluation components.

Interventions of focus

MHPSS articles varied greatly in terms of type of intervention and included psychological interventions (psychotherapy) (n=33; 32%),[169,186,207,220,222,224,225,229,231,232,234,236–239,245,251–253,255,257,259–264,267,274,277,278,280,281] screening tools and methods (n=12, 12%),[223,230,235,240,243,249,268,271,272,276,279,282] psychosocial support programmes (n=8, 8%),[159,190,206,214,218,241,258,270] caregiver/parenting support (n=8, 8),[153,199,201,203,205,208,209,217] capacity strengthening (n=7, 7%),[187,219,228,242,248,256,266] recreational activities (n=7, 7%),[192,193,202,211–213,216] school-based interventions (n=5, 5%),[194–197,269] psychoeducation (n=5, 5%),[68,159,210,244,254]

mHealth interventions (n=3, 3%),[246,247,271], economic empowerment (n=4, 4%),[164,189,191,198] child-friendly spaces (n=3, 3%),[126,200,204] traditional practices (n=2, 2%),[185,215] pharmacological interventions (n=2, 2%)[221,275] and other intervention types (n=6, 6%).[226,227,233,250,265,273] Interventions included as "other" varied but primarily included system-wide, community-wide or multi-layered programmes. Of the 104 studies, 62 (60%) reported community-based interventions. Eight publications did not explicitly report the type of service delivery, but these were largely capacity-strengthening interventions focused on health worker or social worker trainings. Figure 8.8 summarises the types of interventions evaluated at each level of the IASC pyramid.

Figure 8.8 Type of interventions evaluated in MHPSS publications by IASC pyramid categorisation



The most common MHPSS intervention type evaluated was psychological intervention (psychotherapy) (n=33, 32%) and was most often implemented as focused, non-specialised support. Screening tool evaluation was the second most common focus of studies (n=12) and was conducted largely in camp (n=6) or urban (n=4) settings.

Primary outcomes varied widely across studies. Just over half (n=56, 54%) of the included MHPSS publications assessed outcomes related to symptoms of disorders such as post-traumatic stress disorder (PTSD), depression and anxiety. However, study objectives were not always clear and studies often reported multiple measures; as a result, outcomes of interest are not mutually exclusive. Thirty-seven MHPSS articles (36%) also assessed non-disorder-related psychosocial and psychological constructs; and 36 (35%) evaluated non-specific psychological distress and wellbeing outcomes. Specific measures and outcomes varied across studies but generally fit within these categories.

Many of the MHPSS publications evaluated interventions with multiple outcomes of interest. Figure 8.9 lists the range of outcomes reported, classified in categories used in the *R2HC Review and Assessment of Mental Health and Psychosocial Support Intervention Research in Humanitarian Settings*.[283]

Figure 8.9 MHPSS outcomes of interest

Non-specific psychological distress/wellbeing constructs: mental/emotional/psychosocial wellbeing, psychological/emotional distress, mood.

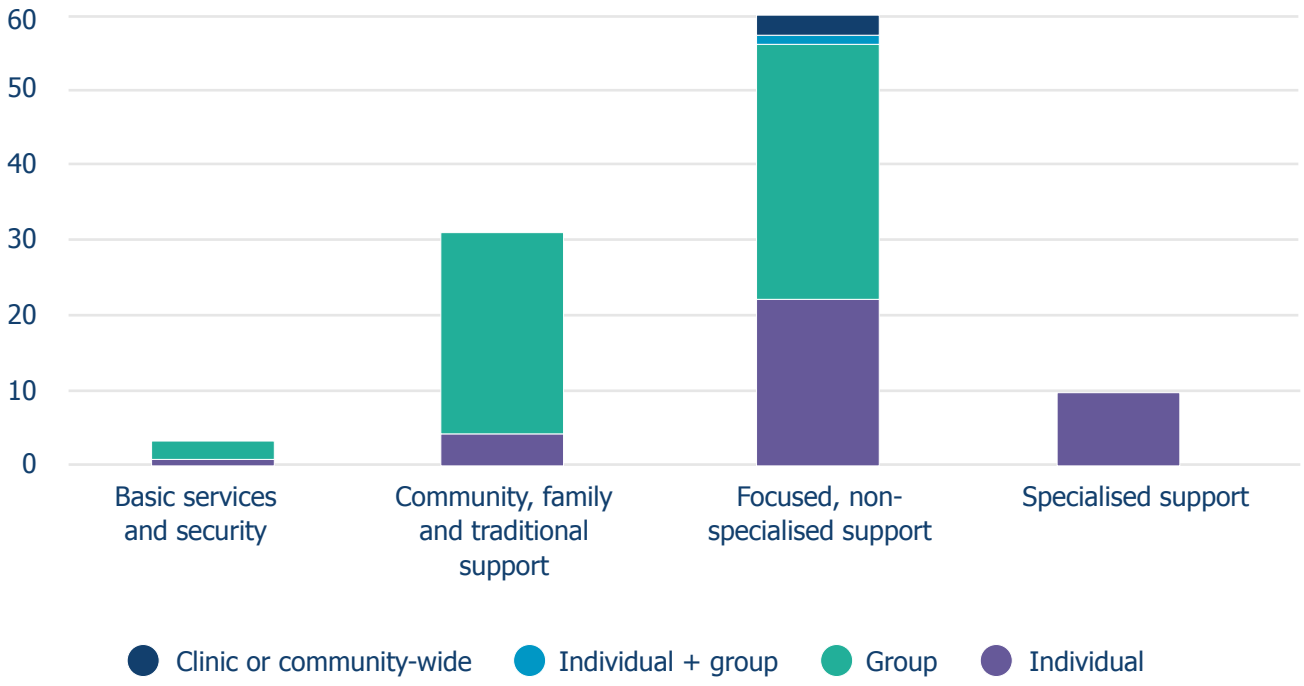
Non-disorder-related psychosocial and psychological constructs: psychosocial wellbeing, resilience, self-efficacy, self-esteem, confidence, quality of life, hope, coping skills, social support/social networks, victimisation, burnout, motivation, prosocial attitudes and behaviour, emotional regulation, identity and values, self-regard, warm and supportive parenting, caregiver-child interactions, role, aggression, reconciliation, forgiveness, mutual healing, social reintegration, social transformation, social participation, community connectedness.

Specific mental health disorder constructs: post-traumatic stress disorder, depression, anxiety.

Basic health services

Articles reporting on basic health services interventions included two mixed-methods studies[189,190] and one quasi-experimental study.[191] The mixed-methods studies each explored forms of economic empowerment (unconditional cash transfers and community kitchens), while the quasi-experimental study reported on a joint psychosocial and oral healthcare intervention. Both economic empowerment interventions were implemented by lay personnel, while the oral health intervention involved a dentist and social workers. The oral health and community kitchen economic interventions were carried out in group formats, while the other economic intervention provided individual unconditional cash assistance (Figure 8.10). The primary aim of all interventions was to address non-specific psychological distress and wellbeing through community-based interventions; however, the economic empowerment interventions targeted women, while the oral hygiene programme focused on children aged 9–14 years.

Figure 8.10 Format of interventions evaluated in MHPSS publications by IASC pyramid categorisation



Community, family and traditional support

Nearly half of the 31 publications documenting community, family and traditional support comprised caregiver/family training and support (n=8, 26%)[153,199,201,203,205,209,217,284] or recreational activities (n=7, 23%).[192,193,202,211–213,216] Other common interventions were school-based interventions (n=4, 13%),[194–197] child-friendly spaces (n=3, 10%)[126,200,204] and psychosocial support programmes (n=3, 10%).[206,214,218] The remaining articles evaluated economic empowerment,[198,207] psychotherapy,[207] psychoeducation[210] and traditional practices (e.g. medication, acupressure, breath work)[185,215] interventions.

Articles reporting on evaluations of community, family and traditional support interventions were evenly distributed among RCTs (n=9, 29%), quasi-experimental studies (n=10, 32%) and observational studies (n=9, 29%), with only three mixed-methods studies. More than half of the studies reported on interventions implemented in the Middle East (n=14, 45%) and Africa (n=12, 39%). All but one of the caregiver/family training or recreational interventions were coordinated in a workshop or group format as they took the form of sports activities, art and dance classes, and caregiver training sessions (Figure 8.10). Similarly, among the 15 caregiver training or recreational activities, two-thirds were led by lay personnel such as an art teacher, a certified transcendental meditation teacher, a dance specialist and individuals with a social care background. Of the eight studies that were implemented by healthcare professionals, three were caregiver trainings and two were forms of art therapy. These professionals included psychologists, trauma counsellors and licensed art therapists.

The three psychosocial support programmes varied widely and included a youth workshop discussing identity and future, a multi-layered student support programme and a livelihood aid intervention through farming support. All three studies measured participants' psychosocial wellbeing, among other factors. Given the nature of these broader support services, non-specific psychological distress and wellbeing was the most common outcome among all studies. This included measures of sleep, parenting skills, social support, experiences of violence and physical fitness. However, non-specific psychological distress and wellbeing was frequently not the only outcome measured – it was often assessed alongside symptoms of depression, anxiety, PTSD or social and emotional wellbeing.

Many of the evaluated interventions focused on non-displaced (emergency-affected) (n=12, 39%) or refugee populations (n=8, 26%). Eight (26%) publications also reported on interventions among multiple population types, usually including a refugee population and the host community. Among the 11 interventions focused solely on refugees or IDPs, programmes took place in camp (n=9) or urban settings (n=2), while studies assessing multiple population types took place in non-camp settings.

Focused, non-specialised services

The most common type of focused, non-specialised services evaluated were psychological interventions (psychotherapy), accounting for 28 (47%) of articles.[169,220,222,224,225,229,231,232,234,236–239,245,251–253,255,257,259–261,263,264,268,277,278] Nine (15%) articles on focused, non-specialised services were evaluations of screening tools and methods[223,230,235,240,243,249,268,271,272] and six (10%) evaluated capacity-strengthening interventions.[187,219,228,242,248,256,266] Eighteen (30%) other articles included broader health system or community interventions,[226,227,233,250,265,273] psychosocial support interventions,[159,241,258,270] mHealth interventions[246,271] and a school-based intervention.[269] The interventions were distributed between individual (n=24, 40%) and group formats (n=37, 61%) (Figure 8.10).

Descriptive and observational studies (n=19, 32%) or RCTs (n=21, 34%) were the most commonly used study designs. The included quasi-experimental studies were generally conducted to evaluate psychotherapy or psychoeducation interventions (n=8, 13%) to assess various symptoms of disorders such as PTSD, anxiety, depression or non-disorder-related psychosocial and psychological

constructs such as stigmatisation, functional impairment or emotion regulation. The two economic evaluations assessed cost-effectiveness of group-based psychological interventions for conflict-affected people, one for young people in Sierra Leone[252] and the other for adults in Pakistan.[241]

The 28 (47%) focused, non-specialised psychological interventions included variations of individual and group counselling such as cognitive behavioural therapy (n=14) or integrative programmes such as the Youth Readiness Intervention (n=4) or the Common Elements Treatment Approach (CETA, n=2). Problem Management Plus (PM+, n=4) and Forensic Offender Rehabilitation Narrative Exposure Therapy (n=2) psychotherapy programmes were also used in several contexts. Twenty of the 26 psychological interventions were conducted by lay personnel, predominantly in a group setting.

Among the publications evaluating screening tools and methods, all were delivered individually. These tools varied widely but were mainly tested with refugees (n=7). Only two of the nine publications were tested with emergency-affected people or IDPs. Three of the included articles tested screening conducted via the internet or SMS. Nearly all evaluations of screening tools and methods (n=8) were descriptive or observational studies and the type of personnel who implemented the intervention was often unclear.

All six health worker training/care interventions were conducted in groups and involved stress management trainings, psychological first aid and trauma alleviation techniques. The six interventions categorised as "other" referred to multi-stage or community-based interventions including a stepped-care intervention and a restructured integration of mental healthcare into primary services. These interventions served as capacity strengthening, but often involved activities implemented at clinic- or community-wide scale.

It was not uncommon for studies evaluating focused, non-specialised services to have more than one primary outcome or focus. In contrast to articles evaluating community and family support interventions, evaluations of focused, non-specialised interventions tended to assess non-disorder-related psychosocial and psychological constructs, as well as symptoms of disorders. Less than 20% (n=11) of the publications looked at non-specific psychological distress and wellbeing. Outcomes related to symptoms of disorders included symptoms of PTSD, depression and anxiety; common non-disorder-related outcomes included stress, functional impairment, conduct or behavioural problems, and stigma.

Specialised services

The largest proportion of articles reporting on specialised services were evaluations of psychological interventions or psychotherapy (n=4, 60%).[186,274,280,281] Three (30%) specialised services articles reported on evaluations of screening tools or methods,[276,279,282] two (20%) reported on pharmacological studies,[221,275] and one (10%) reported on health worker training on psycho-traumatology.[187]

The specialised psychological interventions evaluated primarily focused on outcomes such as PTSD, depression, anxiety and daily functioning. Three of the four psychological intervention studies evaluated the use of eye movement desensitisation and reprocessing (EMDR), while the others

evaluated psycho-traumatology and trauma stabilisations practices. None of the interventions were conducted in a group format (Figure 8.10).

Each of the three screening tool publications were carried out in very different settings; the validation study of the adapted Extreme Experiences Scale took place among emergency-affected people in an urban setting in Colombia.[276] The sequential screening study for the Patient Health Questionnaire was conducted in a Syrian refugee camp in Greece.[279] The third study evaluating the clinical utility of the International Trauma Questionnaire was conducted with refugees throughout Lebanon.[282] Despite the differences in study settings, all screening tools were conducted individually by health personnel such as psychologists, research team members or a psychotherapist.

Cumulative summary of recent MHPSS publications

Together, HHER1[2] and HHER2 identified 165 articles published between 1980 and April 2021 that report on the effectiveness and/or cost of MHPSS interventions or tools in humanitarian settings. Comparison of articles included in HHER1 and HHER2 suggests an increase in both the volume and diversity of findings in recent years. Although this report focuses on updating HHER1 and reporting on changes in research since it was conducted, it is important to note that HHER1 and HHER2 were each preceded by focused reviews and research priority-setting exercises that provide further detail on the scope of evidence in this field and research priorities defined by international actors. HHER1 findings should therefore be considered alongside articles presented in a 2010 review,[285] the research prioritisation[286] findings, the HHER2 findings and the recent Elrha report on a review of MHPSS intervention research in humanitarian settings between 2010 and 2020, along with recommendations for future research directions emerging from associated stakeholder consultations.[283]

Changes in research between the review periods

Key differences in the studies included in both evidence reviews are presented in Figure 8.11. HHER1 identified 61 MHPSS articles across 16 years, while HHER2 found almost double that number in only eight years. The study designs used in HHER1 and HHER2 were similar in that observational studies were the most common, followed by experimental and quasi-experimental studies; however, a greater use of mixed-methods studies was demonstrated in HHER2. The recent Elrha report noted that practitioners found mixed-methods studies where high-quality quantitative research is complemented with qualitative data to be particularly useful.[283] Only one economic evaluation was identified in each review period.

Figure 8.11 Comparison of MHPSS research across evidence reviews

Study design and quality	HHER1 (1980–2013) 61 articles	HHER2 (2013–2021) 104 articles
Study design		
Experimental	19	33
Quasi-experimental	19	20
Observational	**22**	**34**
Mixed-methods	-	16
Economic evaluation	1	1
Study quality		
Low risk of bias	Comparable quality assessment not completed in HHER1.	18
Moderate risk of bias		11
High risk of bias		14
Unclear risk of bias		**61**
Study characteristics		
Region		
Africa	11	**36**
Asia	17	31
Latin America/Caribbean	2	3
Middle East	**20**	27
Europe	10	6
Multiple	1	1
Crisis type		
Armed conflict	**40**	**86**
Environmental disaster	21	9
Outbreak		2
Multiple		7
Population type		
Refugee	5	**33**

Internally displaced	10	11
General population	**45**	1
Multiple	1	19
Other/unspecified	-	2
Study topics and interventions		
Topic area		
Basic services and security	Comparable topic areas not used in HHER1	3
Community, family, traditional treatments		31
Focused, non-specialised services		**60**
Specialised services		10
Intervention type		
Psychological interventions	**30**	**33**
Tool validation/Screening tools	-	12
Psychosocial support	9	9
Caregiver/parenting support	-	8
Capacity strengthening	-	7
Psychoeducation	8	5
Recreation	5	7
School-based intervention	6	5
Internet/SMS	1	5
Economic empowerment	-	5
Other	6	14

In HHER1, most articles reported on interventions implemented in the Middle East and Asia, while HHER2 documented an increase in studies conducted in Africa. The recent Elrha review found research concentrated in Africa and not the Middle East and Asia, though methods and inclusion criteria for that review differed from HHER2.[283] In both HHER1 and HHER2, the majority of publications reported on areas affected by armed conflict, followed by environmental disasters. Interventions for general or refugee populations were most prevalent in HHER1; and while HHER2 still found most studies reported on interventions for the general population – primarily emergency-affected (non-displaced) populations – there was an increase in the proportion of articles reporting on interventions for refugee populations and IDPs, as well as studies focusing on multiple populations.

IASC guidelines emphasise the need for integrated and multi-layered support systems that encompass the following: basic services and security; community and family support; focused, non-specialised support; and specialised support. The IASC recommends concurrent implementation of interventions at each of these levels but does not provide guidance on referral systems and pathways for moving between intervention levels. While HHER1 did not categorise types of interventions by IASC guidelines, HHER2 found evaluations to be concentrated on interventions at community, family and traditional support levels (n=31, 30%), as well as focused, non-specialised support level (n=60, 59%). However, classification is not an exact science. Recent reviews and commentaries have highlighted a lack of clarity in MHPSS terminology and intervention typologies, including how to apply classifications used in the IASC MHPSS intervention pyramid and how to select outcome measures appropriate to intervention scope, duration and participant population.[283,287,288] Similarly, while HHER1 classified articles by primary area of intervention, HHER2 allowed articles evaluating interventions addressing more than one health area to be included in multiple topic-specific reviews. Of 104 articles included in HHER2, only six evaluated interventions address multiple needs: one evaluated an intervention included in the NCD review,[210] two evaluated interventions related to GBV included in the SRH review,[164,169] two evaluated maternal mental health interventions included in the SRH review,[153,159] and one evaluated a maternal mental health and infant feeding support intervention included in both the SRH and Nutrition reviews.[126]

IASC guidelines also recommend a divergence from PTSD as the sole measured outcome given that the experiences of people in humanitarian settings can vary greatly. In HHER1, the primary outcomes in 39 (64%) of the 61 included articles were measures of PTSD, while seven (11%) measured depression, 13 (21%) general mental health and six (10%) functioning. In contrast, while half of the publications included in HHER2 (n=56, 54%) reported specific symptoms of disorders such as PTSD, depression and anxiety, many articles demonstrated a focus on multiple outcomes. Seventy-three (71%) of the 104 articles included in HHER2 also measured non-disorder-related psychosocial and psychological constructs, as well as non-specific psychological distress and wellbeing outcomes. Many articles included a broad range of interventions or outcomes and might not have fit perfectly into the presented categories of interventions or outcomes, contributing to the challenge of synthesising findings across studies.

The consensus-based research agenda for MHPSS in humanitarian settings published in 2011 identified effectiveness of family- and school-based interventions to prevent mental disorders and protect psychosocial wellbeing, and sociocultural adaptation of MHPSS interventions as top intervention research priorities.[286] HHER1 proposed that there were gaps in evidence on a number of topics including effectiveness of psychosocial interventions; feasibility of digital health interventions; effectiveness and feasibility of training interventions; and effectiveness of treatment for severe mental disorders, addiction and substance misuse. A need for evidence on intervention effectiveness for particular populations of interest (children and adolescents, older populations and survivors of GBV) was also identified in HHER1. While HHER2 found relatively few studies with a focus on addiction, substance misuse, suicide or prevention, it did identify a number of evaluations of psychosocial support, digital health and capacity-strengthening interventions published over the past eight years. Changes in MHPSS research trends were also documented in the recent Elrha review of MHPSS intervention research in humanitarian settings between 2010 and 2020, which found an increase in the quantity and breadth of research on the effectiveness of MHPSS interventions in humanitarian settings over the past decade.[283] Authors noted a common focus on

group interventions during this period, as well as a general shift from focusing on mental health disorders and 'dysfunction' to more positive mental health and wellbeing measures.

MHPSS evidence gaps

Since HHER1 was conducted, at least ten other systematic reviews of MHPSS interventions in humanitarian settings have been published (in addition to the recent Elrha review). Six of these reviews focused on evidence of effectiveness of MHPSS interventions for specific purposes or population groups,[289–294] one focused specifically on evaluations of psychosocial interventions for prevention or promotion rather than treatment of mental disorders,[295] one focused on MHPSS service delivery strategies[296] and two focused on factors affecting MHPSS intervention implementation or scale-up.[297,298]

Reviews on psychosocial interventions, the effectiveness of psychological therapies for treatment of common mental disorders, and on the effectiveness of talk therapies delivered by lay personnel all noted the need for more high-quality replication studies using comparable methods and outcomes to evaluate the effects of interventions in different settings.[291,292,295] Ryan et al. (2021) also specifically noted the need for further research on group therapy delivered by lay personnel, particularly superiority trials comparing different modes of delivery (individual vs group).[291] Reviews focused on psychological and social interventions to prevent common mental disorders and on suicide prevention strategies also called for more research, specifically for rigorous studies to assess the impact of preventative interventions on incidence of mental disorders in children and adults, and to examine the impact of intervention strategies on suicide-related behaviours in these populations.[289,290] All reviews highlighted the need for more consistent terminology definitions (e.g. how lay health workers are defined, what constituted a psychosocial intervention); richer descriptions of interventions, including how they are adapted and implemented and by whom; and longer-term follow-up. Some also noted gaps in research on populations affected by climate change and infectious disease outbreaks;[291] evaluation of psychosocial support interventions integrated in nutrition and WASH interventions;[295] and how effects of MHPSS interventions for children may differ for subpopulations such as younger children, displaced children and children from larger households.[293]

The reviews focused on service delivery and factors affecting MHPSS intervention implementation and scale-up also called for further research to support theorisation on the links between programme objectives, intervention components, delivery mechanisms and intended outcomes, as well as more attention on the integration and sustainability of interventions in existing healthcare delivery systems.[297,298] A recent series of consensus-based exercises to identify psychosocial support research priorities identified a strong preference among humanitarian programme implementers to focus research on community-based psychosocial support interventions, followed by psychosocial support integrated into basic services, psychosocial support to caregivers to improve child wellbeing, GBV programming and classroom-based interventions.[299] Potential new horizons highlighted in the recent Elrha report also reinforce calls to evaluate the impact of broad, community-based interventions on positive wellbeing measures; longitudinal tracking of longer-term intervention impacts and implications; research on integration of MHPSS in other health and non-health programmes; and the effectiveness of interventions for specific population groups where evidence is limited.[283]

Recommendations for future MHPSS research

Based on this synthesis of recent peer-reviewed publications, recommendations for MHPSS research in humanitarian contexts that should be prioritised include the following:

- Continue to support implementation and coordination of **replication studies** to better understand the effectiveness of interventions and delivery modalities (individual vs group) **across diverse humanitarian settings and for varied subpopulations**, including young children and adolescents.

- Invest in implementation research to inform and learn from MHPSS **integration and scale-up efforts, including cost analyses** where appropriate.

- Embrace the research **implementation and uptake recommendations outlined in the Elrha *Review and Assessment of Mental Health and Psychosocial Support Intervention Research in Humanitarian Settings***[283] and other recent consensus-based research prioritisation exercises.

9

Non-communicable Diseases

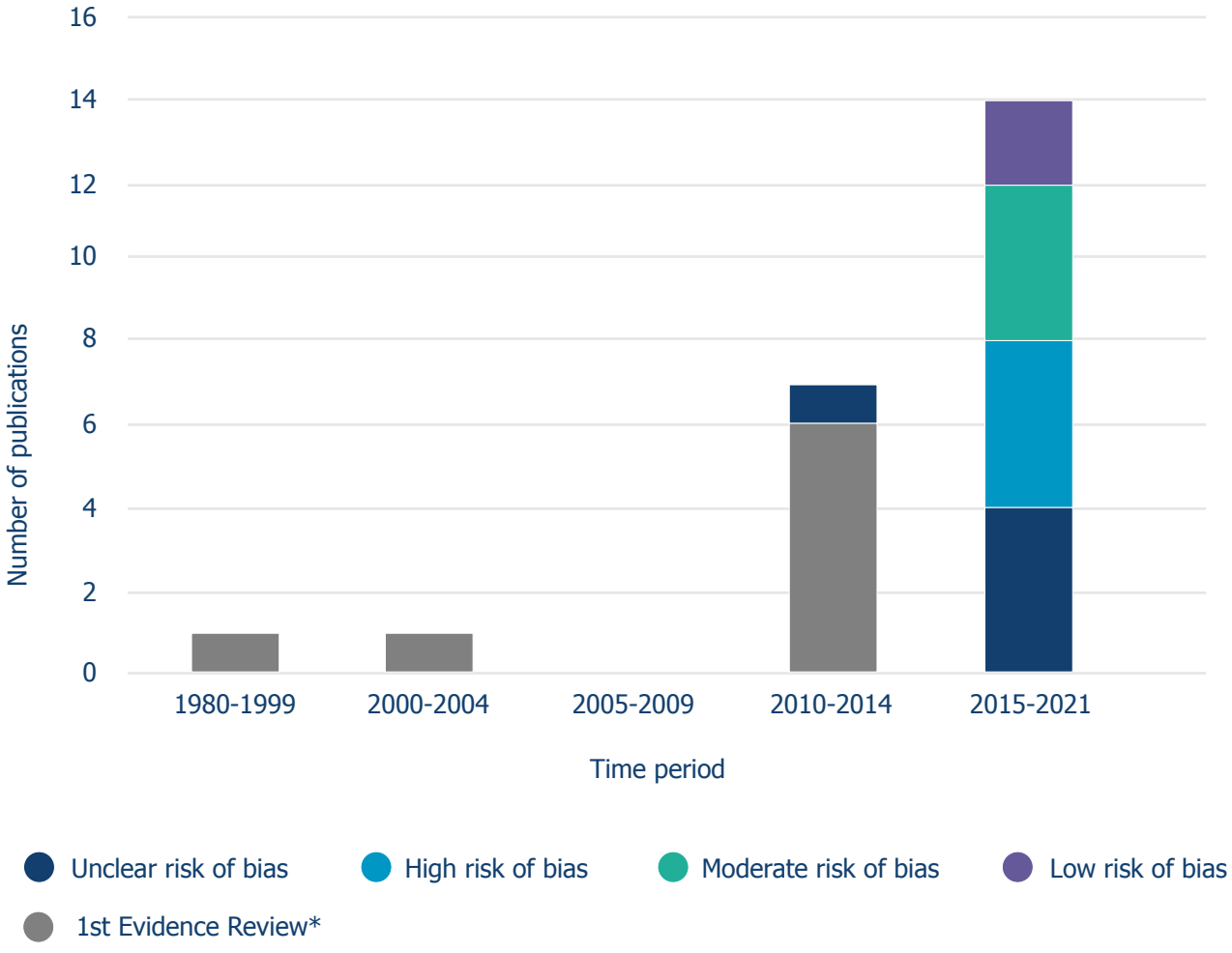
9. NON-COMMUNICABLE DISEASES

15 Peer-reviewed publications in 8 years

Overview of literature search findings

Of the 269 peer-reviewed articles meeting eligibility criteria across all topic areas, 15 (5.6%) reported on NCDs. The 15 peer-reviewed articles present findings from 14 unique studies; a detailed summary of included studies is presented in Annex 11. The number of NCD articles published in the eight-year review period from 2013 to 2021 is 1.9 times more than the number of publications included in HHER1 (n=8), which spanned a 32-year period from 1980 to 2013. HHER1 had an average of 0.25 publications per year, compared to 1.9 in HHER2. This progression in publication volume is illustrated in Figure 9.1, where a dramatic increase in NCD research is observed from 2010 onwards.

Figure 9.1 Quantity and quality of non-communicable disease publications over time



*Non-comparable quality appraisal was conducted in HHER1 (1980-2013).

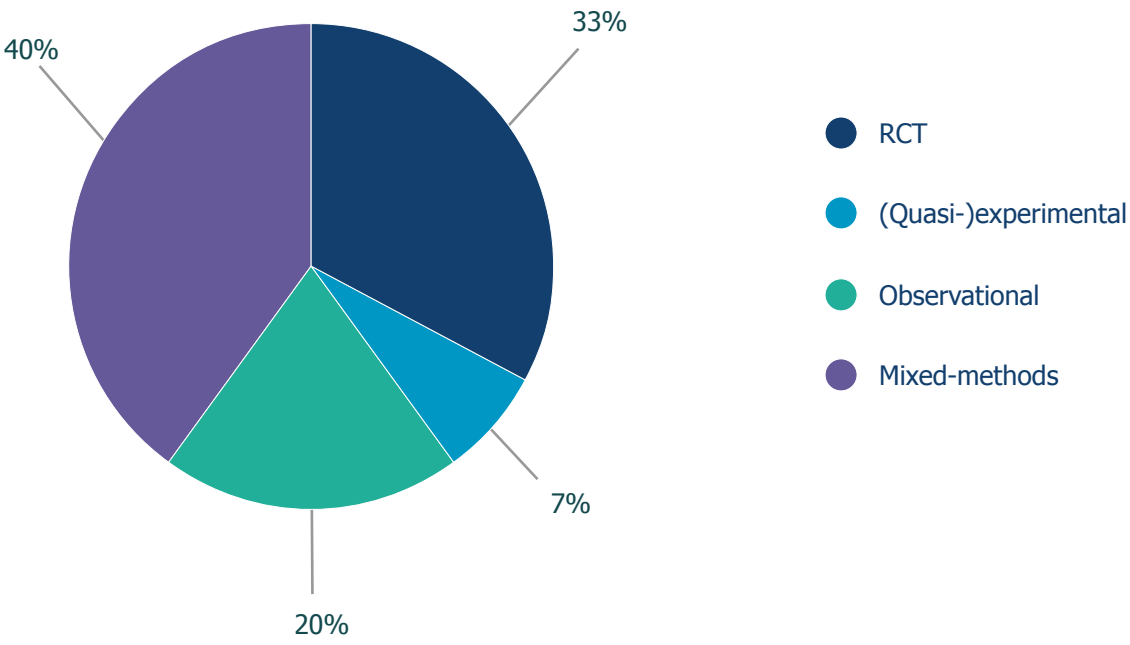
Study designs and research quality

Included articles were categorised by study design and risk of bias was assessed accordingly for each article. A summary of study design and quality appraisal findings follows.

Study designs

Observational and mixed-methods studies accounted for nine (60%) NCD articles, while experimental and quasi-experimental studies accounted for six (40%). The most common study design among articles reporting on NCDs was mixed-methods, comprising 40%. Of the six mixed-methods publications, two studies included descriptive quantitative and costing outcomes; one included quantitative, qualitative and costing outcomes; and the remaining three studies evaluated descriptive quantitative and qualitative outcomes. Observational descriptive quantitative analysis and RCTs each accounted for five (33%) publications (Figure 9.2).

Figure 9.2 NCD research by type of study design



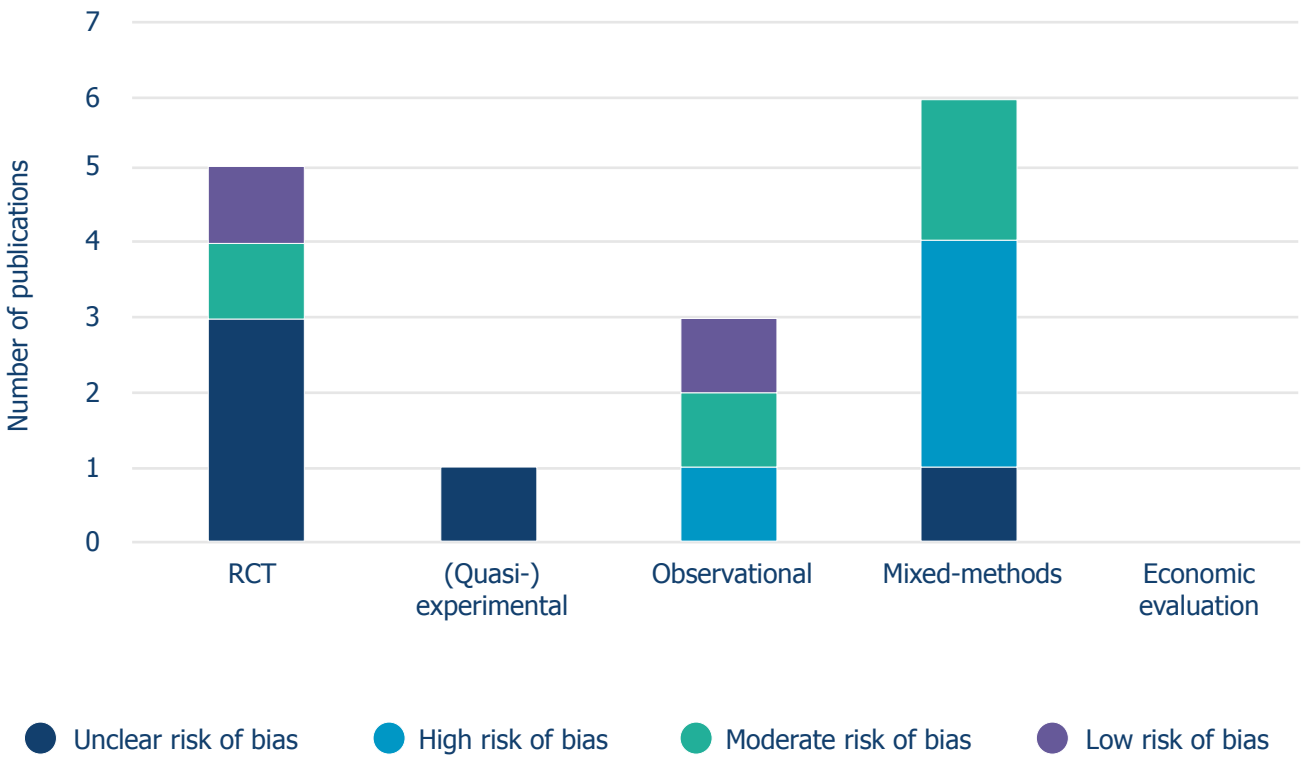
Study sample sizes ranged from 12 (patients with type 2 diabetes enrolled to evaluate mobile health for diabetes management)[300] to 5,045 participants (individuals with NCDs enrolled to evaluate a primary-level NCD programme),[301] with larger samples drawn from observational studies (243 to 5,045 across nine publications) relative to experimental studies (12 to 600 participants across six publications). Six studies (40%) reported on sample sizes of 1,000 or more participants, while three studies (20%) reported on sample sizes of fewer than 100 participants.

Quality appraisal

Of the 15 included articles reporting on NCD interventions, only ten (67%) included sufficient information to make a judgement on risk of bias. Of the 15 total articles, two (13%) were judged to have a low risk of bias, four (27%) a moderate risk and four (27%) a high risk; the remaining five (33%) were determined to have an unclear risk based on the information available in the article.

Risk of bias by study design is presented in Figure 9.3. Of the three observational studies, one had a low risk of bias, one had a moderate risk and one had a high risk. Several of the experimental studies reported insufficient information to assess risk of bias including the only quasi-experimental design and three of the five articles reporting on RCTs. Of the remaining two RCTs, one was assessed as having a low risk of bias and the other a moderate risk. The six mixed-methods design studies included three studies assessed as having a high risk of bias, two a moderate risk and one an unclear risk.

Figure 9.3 Risk of bias in NCD publications, by study design



Research location, setting and population type

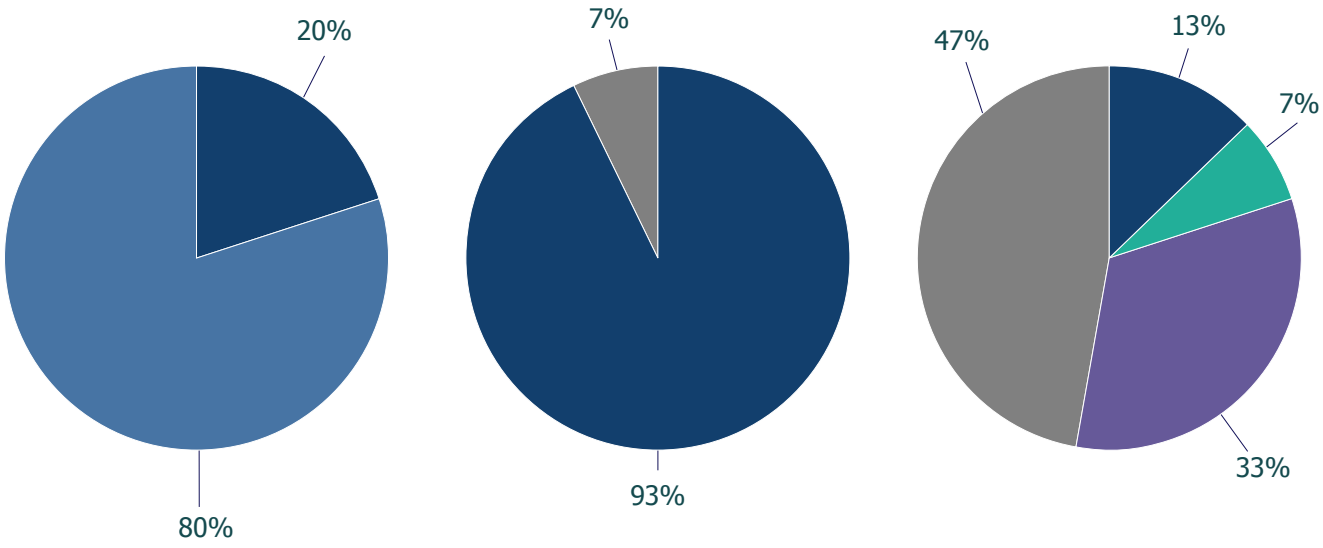
The location, setting and population type of study for NCD research in humanitarian contexts is summarised in Figure 9.4; a map of countries in which NCD research was conducted is provided in Annex 4. The majority of NCD publications reported on interventions in the Middle East (n=12, 80%). The remaining three (20%) articles reported on interventions in Africa.

The majority of articles (n=14, 93%) reported on NCD interventions in areas or among populations affected by armed conflict. The remaining article reported on an NCD intervention within a population affected by both armed conflict and a disease outbreak (Ebola and conflict in the DRC).

The largest proportion of articles (n=7, 47%) reported on NCD interventions in urban non-camp settings. Three studies (20%) reported on interventions in multiple settings: two in rural camp and non-camp settings; and one in non-camp urban and rural settings. Two studies (13%) reported on NCD interventions in camps, two (13%) on research conducted in rural non-camp settings and for one study the setting was unclear.

The largest proportion of articles (n=7, 47%) reported on interventions for multiple population types, including six studies in both refugee and host community populations and one study in both IDPs and host community populations. Research on mixed populations was followed by studies on NCD interventions in refugee (n=5, 33%) and emergency-affected (n=2, 13%) populations and IDPs (n=1, 7%).

Figure 9.4 Distribution of NCD publications by region, crisis and population type

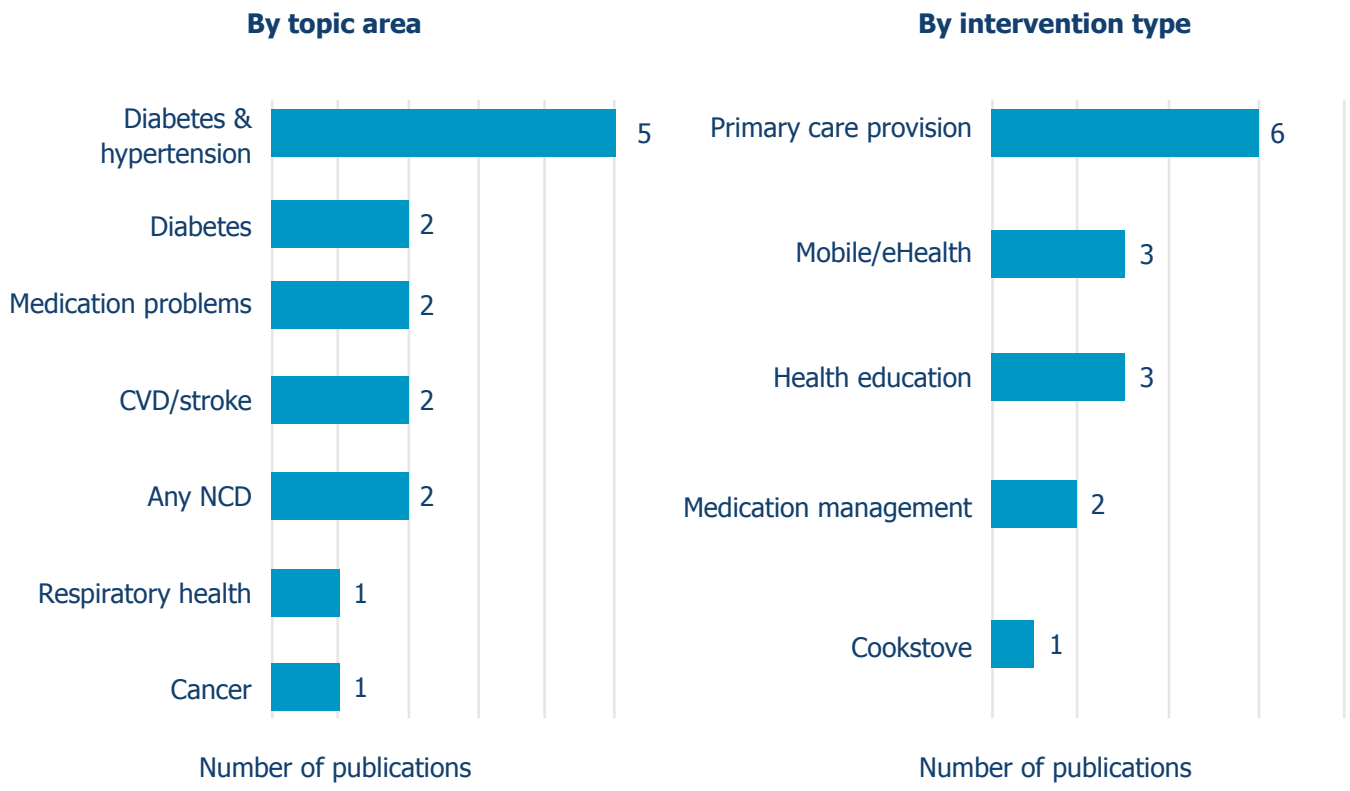


Topical areas and interventions of focus

Topical areas of focus

Figure 9.5 presents an overview of the distribution of topics and interventions across articles reporting on NCDs. Diabetes and hypertension interventions accounted for five (33%) NCD articles.[302–306] Two articles (13%) each were for diabetes,[300,307] cardiovascular disease (CVD)/stroke,[308,309] medication-/treatment-related problems (for any/unspecified chronic conditions),[310,311] or studies that included unspecified NCDs more broadly.[210,301] One study (7%) each were also reported for respiratory health[312] and breast and cervical cancers.[313] Study settings varied by topic area, though, as previously mentioned, studies on NCDs were predominantly conducted in the Middle East (Lebanon, Jordan, Iraq and Turkey).

Figure 9.5: NCD research by topics and interventions of focus



Diabetes and hypertension

Four of the five articles reporting on both diabetes and hypertension were conducted in the Middle East and involved refugees (n=2) or a combination of refugee and host communities (n=2). The remaining diabetes and hypertension article was conducted in the DRC and involved a combination of IDPs and the host community. Of the five articles reporting interventions targeting both diabetes and hypertension, three articles addressed integrative primary care provision and two mobile/eHealth approaches to NCD care. A diverse array of outcomes of interest were reported across these four observational and one mixed-methods designs, with some studies reporting multiple

outcomes, including: clinical outcomes (HbA1C levels and blood pressure) (n=2);[300,302] programme or consultation attendance (n=1);[303] screening or diagnostic rates (n=1);[305] lifestyle modification or behaviour change (n=1);[304] treatment adherence (n=1);[303] programme cost (n=1);[303] patient satisfaction (n=1);[304] and evaluation of medical practices (n=1).[306]

Of the two studies reporting on diabetes alone, one was with an emergency-affected population in Iraq, while the other was conducted among IDPs in the DRC. The two studies reporting interventions targeting diabetes included primary care provision and mobile/eHealth approaches from a feasibility trial and an observational study. Both studies focused primarily on clinical outcomes,[300,307] though one of the articles also reported programme management outcomes (n=1) and programme cost (n=1).[307]

Medication management

Outcomes regarding treatment-related problems associated with medication management of NCDs (n=2) were only available on refugee populations in Jordan. The two related articles reporting on interventions targeting medication use for NCDs were RCTs investigating home-based medication management. Outcomes of interest in these two studies were the number of treatment-related problems due to prescription errors.[310,311]

Cardiovascular disease/stroke

The two studies reporting on CVD or stroke topics were based on information collected in the Middle East and involved an emergency-affected population in Iraq, and both refugee and host communities in Jordan. The two articles reporting on interventions targeting CVD or stroke were an RCT and a mixed-methods design employing health education and primary care provision interventions. Outcomes of interest in these two studies were health belief changes (n=1), risk scores (n=1) and evaluations of medical practices (n=1).[308,309]

Any NCD

The two studies that broadly focused on any NCDs were set in Jordan with both refugee and host communities. These articles reported on a quasi-experimental study and a mixed-methods study that included primary care provision and health education approaches. Outcomes of interest in these two studies were programme cost (n=1), risk scores (n=1) and clinical outcomes (n=1).[210,301]

Respiratory health

The single study on respiratory health was conducted in Rwanda and involved refugees in a camp setting. An observational study was used to investigate effectiveness of a modified cookstove on forced expiratory volume (FEV1) outcomes.[312]

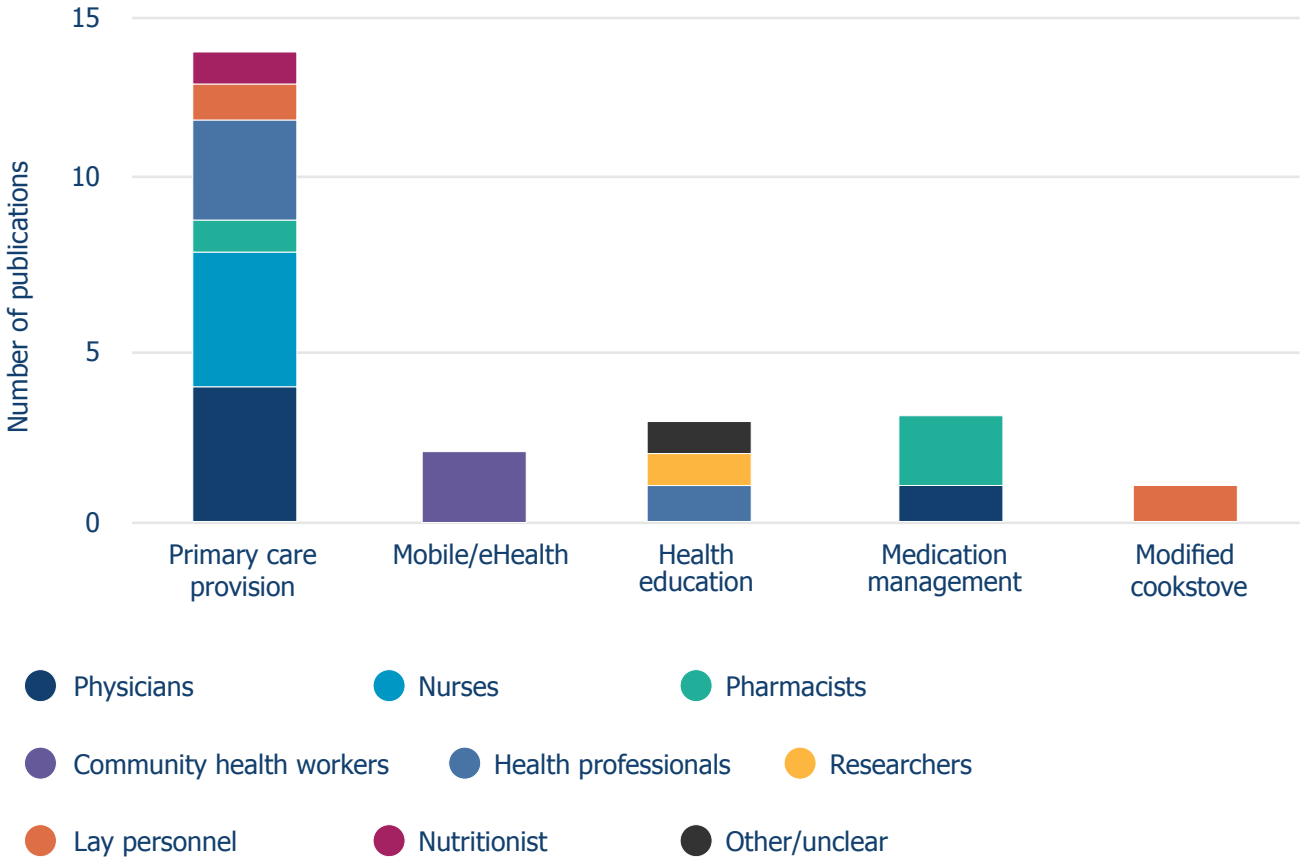
Cancer

The single study reporting on breast and cervical cancer was conducted among refugees in Turkey. It was an RCT evaluating the efficacy of a health education programme to improve awareness and beliefs about breast and cervical cancer.[313]

Interventions of focus

Included articles reported on a range of interventions addressing NCDs, including primary care provision (n=6, 40%),[301–303,306,307,309] mobile/eHealth (n=3, 20%),[300,304,305] health education (n=3, 20%),[210,308,313] medication management (n=2, 13%)[310,311] and cookstove improvement (n=1, 7%).[312] Of the 15 included articles reporting on NCDs, the majority of interventions were implemented in health facilities (n=10, 67%), followed by community settings (n=5, 33%). Interventions were implemented primarily by health professionals (n=10; 67%), followed by lay personnel alone (n=1; 7%); implementing personnel were not clearly specified in the remaining two NCD articles. The distribution of types of personnel responsible for implementing different categories of interventions is presented in Figure 9.6.

Figure 9.6: Personnel involved in NCD interventions



*Personnel categories are not mutually exclusive; articles may report on interventions with multiple types of personnel.

All studies reporting on primary care provision interventions were facility based, including four conducted in the Middle East and two in Africa, which were implemented by cadres of health professionals including clinical advisors, doctors, nurses or pharmacists.[301–303,306,307,309] The three studies reporting on mobile or eHealth interventions were set in the Middle East. Of these, two articles addressed community-based interventions[304,305] and one a facility-based intervention.[300] Implementation was by cadres of health professionals including nurses and community health workers. The two community-based studies were related publications evaluating a mobile eHealth netbook application to assist with appointment scheduling for refugees with NCDs where implementation of the intervention was done by community health workers.[304,305] The facility-based study centrally monitored blood glucose outcomes in individuals with diabetes participating in a feasibility trial conducted among an emergency-affected population in Iraq.[300]

All three articles reporting on health education interventions for NCDs were facility-based experimental trials (two randomised and one quasi-experimental) conducted in the Middle East.[210,308,313] Implementation was done by the researchers, cadres of health professionals or was not clearly specified by the authors. One health education intervention addressed breast and cervical cancer awareness in Syrian refugees in Turkey and was conducted in a trial setting and implemented by the researchers.[313] The remaining two health education interventions addressed CVD risk. One study aimed to reduce CVD risk via NCD education in health centres used by Jordanians and displaced Syrians.[210] The final study aimed to reduce stroke risk via health belief models and exercise awareness among older adults in Iraq.[308]

The two articles employing medication management interventions were related publications with interventions implemented in community settings by health professional cadres.[310,311] Both studies investigated medication management issues among Syrian refugees living in Jordan through home visits by physicians and pharmacists. The final NCD intervention article reported on a community-based intervention (modified cookstoves) implemented by lay personnel.[312]

Cumulative summary of recent non-communicable disease publications

In this section, the body of evidence on NCDs during the eight-year HHER2 review period is compared against the body evidence captured in HHER1[2] as a means of summarising the cumulative evidence base on various NCD-related topics. A cumulative total of 23 articles were identified between 1980 and April 2021 in HHER1 and HHER2 (Figure 9.7). These articles report on the effectiveness and/or costs of NCD interventions in humanitarian settings. Comparison of articles included in HHER1 and HHER2 suggests an increase in publication volume and more diversity in the geographic regions and disease areas covered in recent years.

Figure 9.7 Comparison of NCD research across evidence reviews

Study design and quality	HHER1 (1980–2013) 8 articles	HHER2 (2013–2021) 15 articles
Study design		
Experimental	1	5
Quasi-experimental	-	1
Observational	**5**	3
Mixed-methods	-	**6**
Economic evaluation	2	-
Study quality		
Low risk of bias	Comparable quality assessment not completed in HHER1.	2
Moderate risk of bias		4
High risk of bias		4
Unclear risk of bias		**5**
Study characteristics		
Region		
Africa	-	3
Asia	1	-
Latin America/Caribbean	-	-
Middle East	**6**	**12**
Europe	1	-
Crisis type		
Armed conflict	**7**	**14**
Environmental disaster	1	-
Multiple	-	1
Population type		
Refugee	**6**	5
Internally displaced	-	1
General population	2	2
Multiple	-	**7**

HHER1 (1980–2013)		HHER2 (2013–2021)	
Study topics and interventions			
Topic area			
Heart failure	1	CVD/stroke	2
Hypertension	1	Respiratory health	1
Diabetes	**3**	Diabetes	2
Chronic kidney disease	1	Diabetes and hypertension	**5**
Arthritis	1	Medication problems	2
Thalassemia	1	Cancer	1
Intervention type			
Disease management protocols	2	Primary care provision	**6**
Cohort monitoring	**3**	Medication management	2
Surgical procedures	1	Health education	3
Haemodialysis	1	Mobile/eHealth	3
Medication	1	Modified cookstove	1

Changes in research between the review periods

HHER1 identified eight NCD articles across 32 years, while HHER2 found over twice as many articles in a substantially shorter eight-year review period. The vast majority of articles in HHER1 were observational in design, while the more recent evidence from HHER2 shows an increase in experimental and mixed-methods designs, in addition to the continued use of observational methods.

In terms of geographic region, the Middle East remained the most studied region for NCD intervention research in humanitarian settings across both reviews. In HHER1, research on NCDs in African countries was notably absent. However, in HHER2 studies conducted in two African countries (one in Rwanda and two in the DRC) were included, but there were no studies conducted in Asia. Crisis types were broadly similar across the two reviews in that armed conflict remained the predominant humanitarian crisis context. In terms of the populations affected by armed conflict, HHER1 identified studies focused on refugees, which remained the case for HHER2, though there was also an increase in the number of publications for interventions targeting both refugees and host communities, specifically in the Middle Eastern countries of Jordan and Lebanon.

Of the six distinct diseases that were addressed in HHER1, only three remained the focus of research included in HHER2: diabetes, hypertension and heart failure. Study of diabetes and hypertension as a joint area of focus has increased over time. Research on chronic kidney disease, arthritis and thalassemia was included in HHER1 but was not in HHER2. There was also a shift in the types of interventions implemented: in HHER1, the majority of studies included monitoring of NCD cohorts or established disease management protocols, whereas HHER2 found the majority of studies investigated methods to integrate NCDs into primary care provision. There was also an increase in the number of studies focusing on NCD health education, utilising mobile/eHealth applications and home medication management in HHER2.

NCD evidence gaps

HHER1 identified gaps in the evidence base and made recommendations for future NCD research around several different themes including: a call for studies conducted in regions beyond the Middle East, interventions to focus on NCD prevention and the administration of essential NCD drugs, higher-quality longitudinal designs and development of guidelines for the delivery of NCD care in crisis settings.[2] A subsequent review on access to NCD care for women and children in conflict settings, which included literature published between 1980 and 2018, noted similar evidence gaps and also elaborated additional concerns, highlighting the limited evidence base on NCDs in conflict settings; a predominance of publications from the Middle East; little to no research addressing the issues of screening, intervention access and coverage, and intervention delivery, quality and effectiveness (e.g. measurement of health outcomes).[314] The conflict review concluded that more rigorous research and reporting on strategies for delivery of NCD care in conflict-affected settings is urgently needed, particularly given the increasing burden of NCDs, along with a greater focus on strengthening patient monitoring systems to enhance access to and to promote sustainable care.[314] Research included in HHER2 is suggestive of partial alignment with those recommendations, with an observed expansion of the study of NCD interventions in Africa, an increase in the number of experimental designs, and an increase in interventions promoting education and awareness of NCDs.

In both HHER1 and HHER2 there was a notable concentration of NCD research in conflict-affected populations and, except for a single article identified in HHER1, a complete absence of literature on NCD interventions in environmental disaster settings, which is an important evidence gap. Both HHER1 and the review of NCD care in conflict settings noted that NCD research has predominantly been conducted in the Middle East and that few other regions are represented, despite growing evidence of a high NCD burden across diverse country and crisis contexts.[2,314] The review of NCDs in conflict settings spanned 1990–2018 and identified only six publications on NCD service delivery in Asia and Africa (three publications from each region). HHER2 identified only three publications from Africa and none from Asia. Issues of underdiagnosis of NCDs, lack of service availability/accessibility and service quality remain critical concerns in parts of Africa and Asia and are topic areas that should be prioritised for future research in the region given the limitations of the current evidence base.

HHER1 reported a low quality and quantity of evidence on NCD intervention effectiveness in humanitarian contexts, a concern that was also identified in the subsequent review of NCDs interventions in conflict settings.[2,314] In particular, the conflict review observed that most studies

used a cohort design, but that only a few were able to consistently follow up participants over time; incomplete reporting was also described. In HHER2, ten of 15 included studies (67%) provided sufficient information for a complete quality appraisal. Of the five studies lacking sufficient information, areas of missing information were mainly from experimental studies with unclear reporting of adequate adherence to assigned interventions, completeness of outcome data, or clarity in how outcomes were measured. In quasi-experimental studies, there was often insufficient information to determine potential for confounding or selection bias. Across the ten studies with adequate information, only two (13%) had a low risk of bias; four studies (27%) were assessed as having a moderate risk and four (27%) a high risk. As such, more complete reporting is critical to improve the strength and wider sectoral utility of research on NCD interventions.

A lack of studies reporting on population-level intervention coverage or effectiveness of interventions in improving health status was identified by the review of NCD interventions in conflict settings and was also identified by this review.[314] Among studies reviewed in HHER2, there was substantial heterogeneity in reporting and measurement of indicators; few studies reported on intervention impacts with respect to health outcomes (e.g. disease control). Given that at least some NCDs have clear guidance for assessing control (e.g. hypertension, diabetes), encouraging the use of common outcome measures across studies related to a particular disease would aid in strengthening the evidence base by facilitating comparison of research findings across studies and locations. Finally, HHER2 identified only two studies that examined cost-effectiveness, both using a mixed-methods approach. The paucity of cost-effectiveness research should also be considered a critical gap in the evidence base given that many NCD interventions are currently available at relatively higher cost, and that these services may be rationed or financially inaccessible in many humanitarian contexts.

Recommendations for future NCD research

Despite the recent increase in research on NCDs in humanitarian settings, the overall extent of the evidence base is limited and important gaps remain. Based on this synthesis of recent peer-reviewed publications and findings from other recent reviews, gaps in the evidence base for NCD research in humanitarian contexts that should be prioritised for future research include the following:

- Recent research on NCDs in humanitarian settings has focused almost exclusively on conflict-affected populations. While there has been diversification in the types of conflict-affected populations that are the focus on the research, NCD research has been virtually absent from both environmental disaster and outbreak settings. While NCD research in conflict-affected populations should continue, **expanding research on NCD interventions in other emergency contexts will address a critical gap in the evidence base**.

- Nearly all intervention research on NCDs in humanitarian contexts to date has been conducted in the Middle East, with few studies in Africa and none in Asia. These two regions are home to the majority of people affected by crises and also have a high NCD burden, indicating that **Asia**

and Africa should be geographic priorities for future NCD research in humanitarian settings.

- Evidence on NCDs in humanitarian settings has largely concentrated on hypertension and diabetes, which are among the most prevalent NCDs. **Research in humanitarian crises should focus on diagnosis, access to care and intervention effectiveness for the most prevalent NCDs**. Research on less common conditions and more costly interventions will have the potential to benefit smaller numbers of people and should be considered triaged appropriately given the many evidence gaps apparent across this topic area.

- Given that access to and capacity of secondary and tertiary care is often limited in humanitarian contexts and that NCD management is often provided in primary care settings, **future research on NCDs in humanitarian crises should focus on research to assess interventions that can be delivered in the context of primary care, including both lower-level health facilities and via community outreach programmes**.

- Due to the longer-term nature of disease progression for many NCDs, **future NCD research should employ longer-term follow up periods**, which will enable a better understanding of intervention impact. In addition, **future research should endeavour to include health outcome measures**, such as disease control or the proportion of patients with complications, which would strengthen both the utility and comparability of evidence.

- The general quality of the NCD evidence base is poor. **Employing more rigorous study designs and improving reporting of both research design and implementation** will enhance the quality of evidence on NCD interventions in humanitarian settings.

10
Injury and Rehabilitation

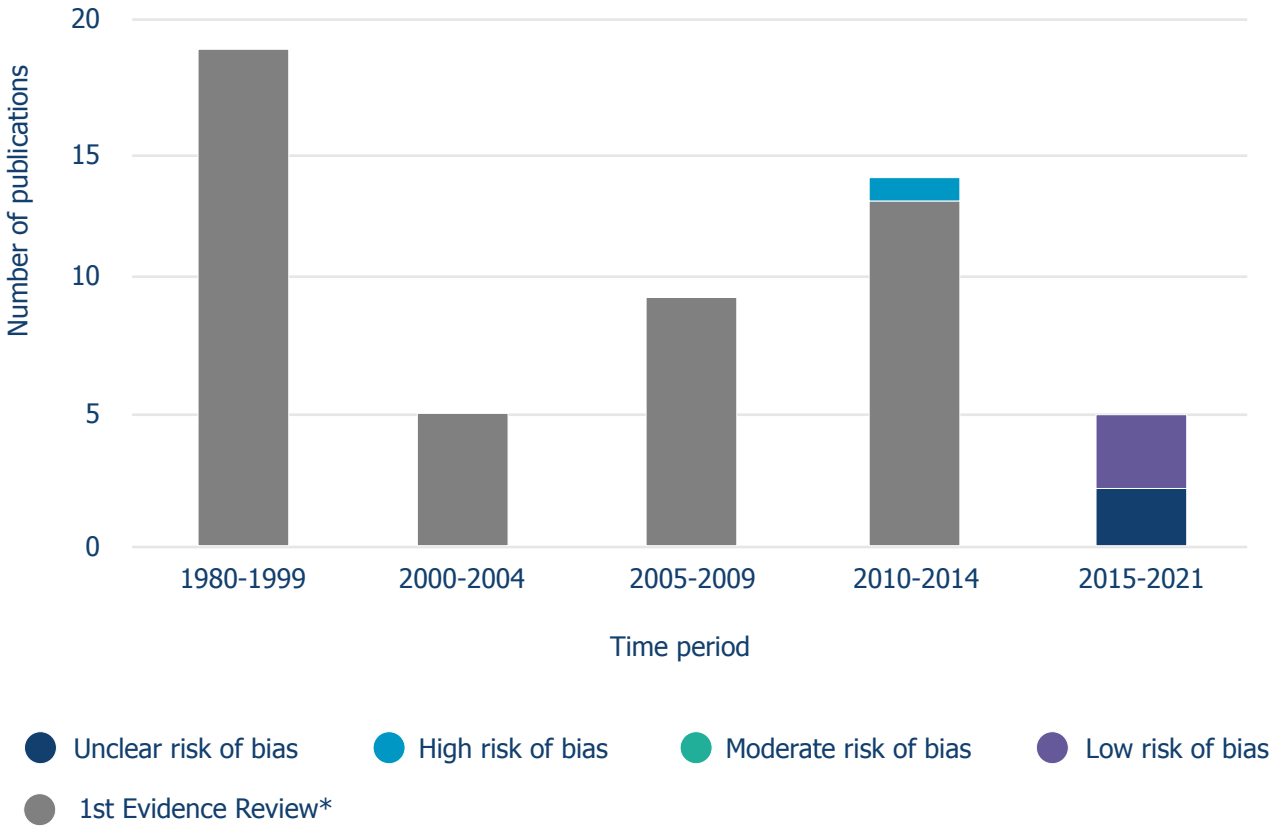
10. INJURY AND REHABILITATION

6 Peer-reviewed publications in 8 years

Overview of literature search findings

Of the 269 peer-reviewed articles meeting eligibility criteria across all topic areas, six (2.2%) reported on injury and rehabilitation; each peer-reviewed article presented findings from a unique study. A detailed summary of included studies is presented in Annex 12. The number of injury and rehabilitation articles published in the past eight years is 13% of the number of injury and rehabilitation articles (n=47) included in HHER1, which spanned a 32-year period. HHER1 and HHER2 averaged 1.46 and 0.75 injury and rehabilitation articles per year, respectively, indicating a reduced publication rate. Of the six articles included in HHER2, four were published between 2018 and 2021 (Figure 10.1).

Figure 10.1 Quantity and quality of injury and rehabilitation publications over time



*Non-comparable quality appraisal was conducted in HHER1 (1980-2013).

Study designs and research quality

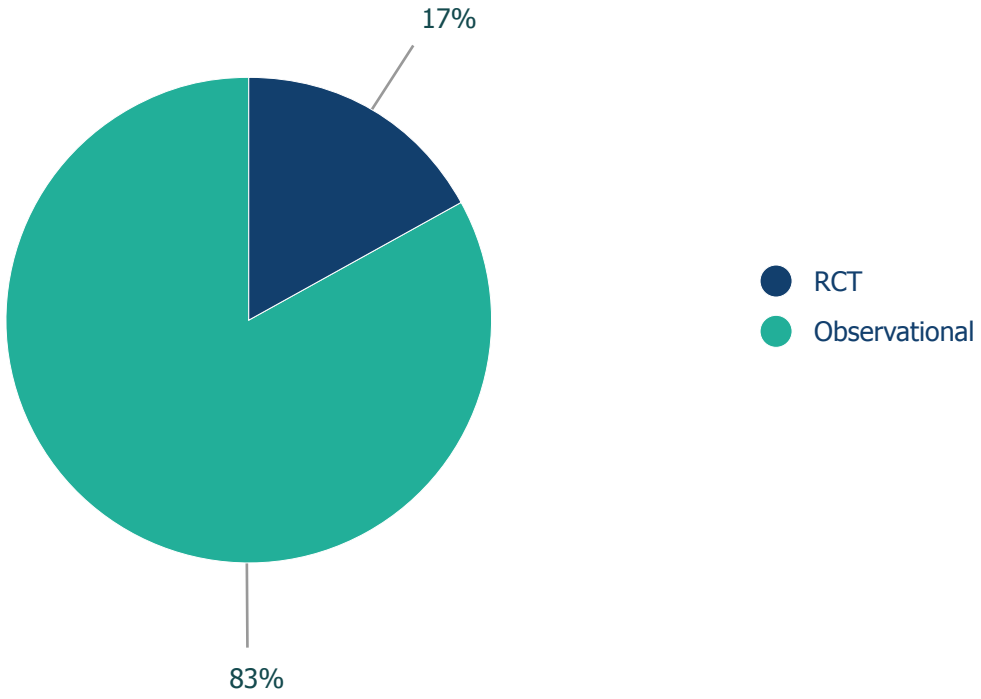
Included articles were categorised by study design and risk of bias was assessed accordingly for each article. A summary of study design and quality appraisal findings follows.

Study designs

Experimental studies accounted for one of the six (17%) included studies, while the majority (n=5, 83%) were observational studies (Figure 10.2). Among the five observational studies, designs included a retrospective cohort study, a pre/post retrospective unpaired comparison, a pre/post non-experimental design, a retrospective analysis of patient medical records and a retrospective analysis of programme data. The RCT was an individually randomised superiority trial conducted at two civilian hospitals in Jordan and Iraq.

Sample sizes in the studies reviewed ranged from 13 (physically impaired earthquake victims to evaluate a rehabilitation programme)[315] to 174 (patients with acute conflict-related extremity wounds to evaluate negative pressure wound therapy compared to standard treatment)316 participants at study enrolment and 13 to 165 participants completing the study. Two studies enrolled 100 participants or more, three studies enrolled between 50 and 100 participants, and one study enrolled 13 participants.

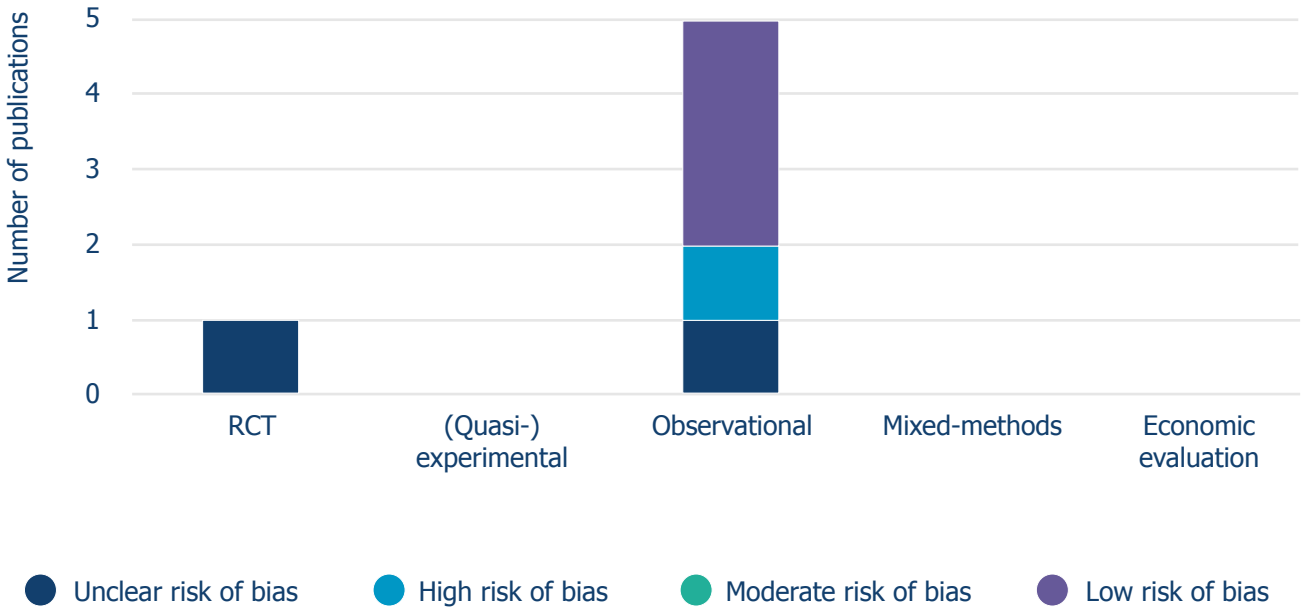
Figure 10.2 Injury and rehabilitation research by type of study design



Quality appraisal

Of the six identified articles reporting on injury and rehabilitation interventions, four (67%) included sufficient information to make a judgement on the risk of bias (Figure 10.3). Of the four articles where quality appraisal was conducted, three (50% of all injury articles) were judged to have a low risk of bias and one (17%) a high risk; the remaining articles (n=2, 33%) were determined to have an unclear risk based on information available in the article. Of the five observational studies, three had a low risk of bias, one a high risk and one (the RCT) an unclear risk.

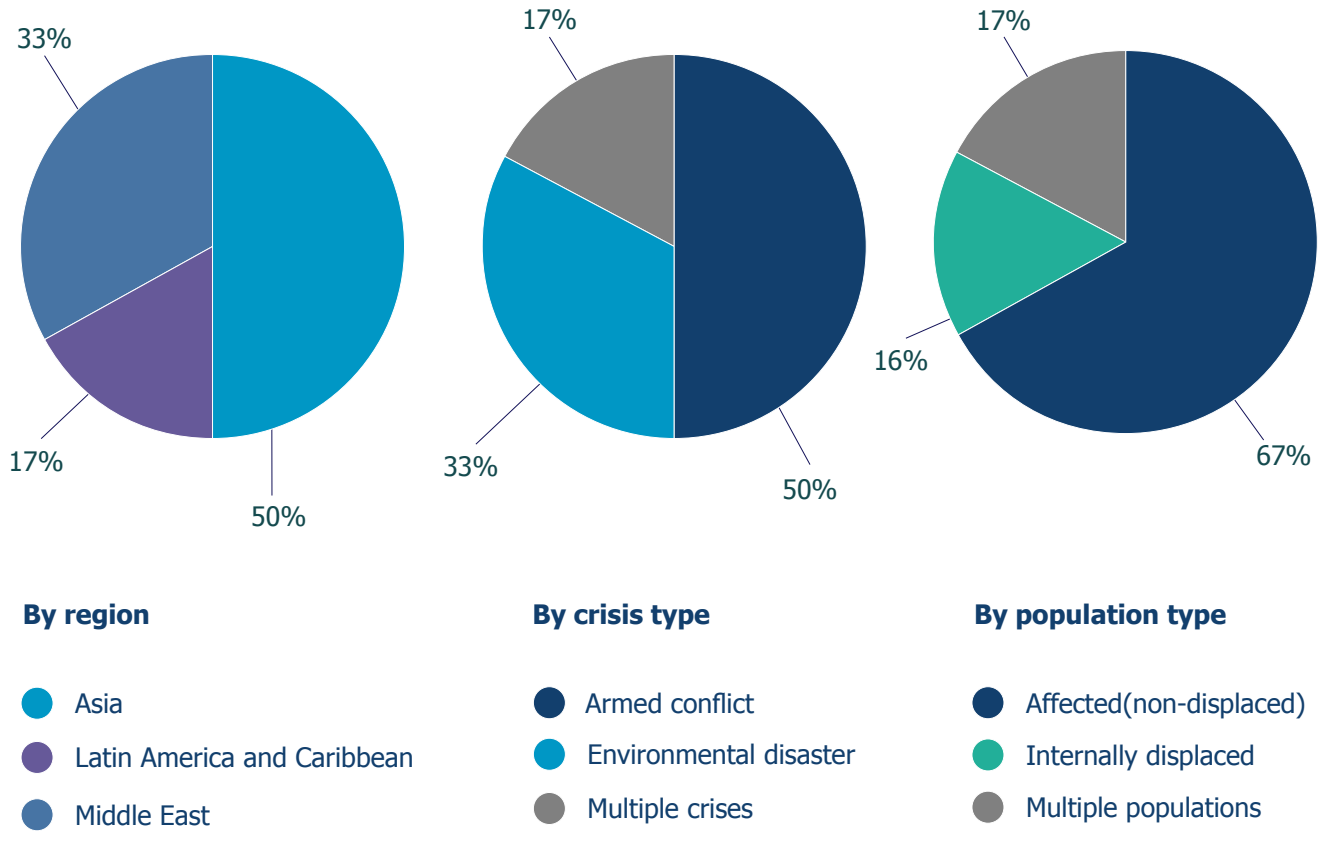
Figure 10.3 Risk of bias in injury and rehabilitation publications, by study design



Research location, setting and population type

The location, setting and population type of study for injury and rehabilitation research in humanitarian contexts is summarised in Figure 10.4; a map of countries in which injury and rehabilitation research was conducted is provided in Annex 4. Half (n=3, 50%) of injury and rehabilitation articles reported on interventions in Nepal, Sri Lanka and China; two (33%) articles reported on interventions in the Jordan/Iraq and Iraq/Afghanistan and one (17%) reported on an intervention in Haiti.

Figure 10.4 Distribution of injury and rehabilitation publications by region, crisis and population type



Half (n=3, 50%) of articles, were from studies in areas affected by armed conflict, while two (33%) were in areas affected by earthquakes; the remaining article was from Haiti, which was described as affected by multiple types of crises. Five studies were conducted in non-camp settings, with one occurring at a health facility built adjacent to camps for IDPs. Four articles reported on an urban setting and one on a rural setting; it was unclear in the sixth article if the setting was urban or rural. Five articles described interventions for emergency-affected (non-displaced) populations and the remaining study took place among IDPs.

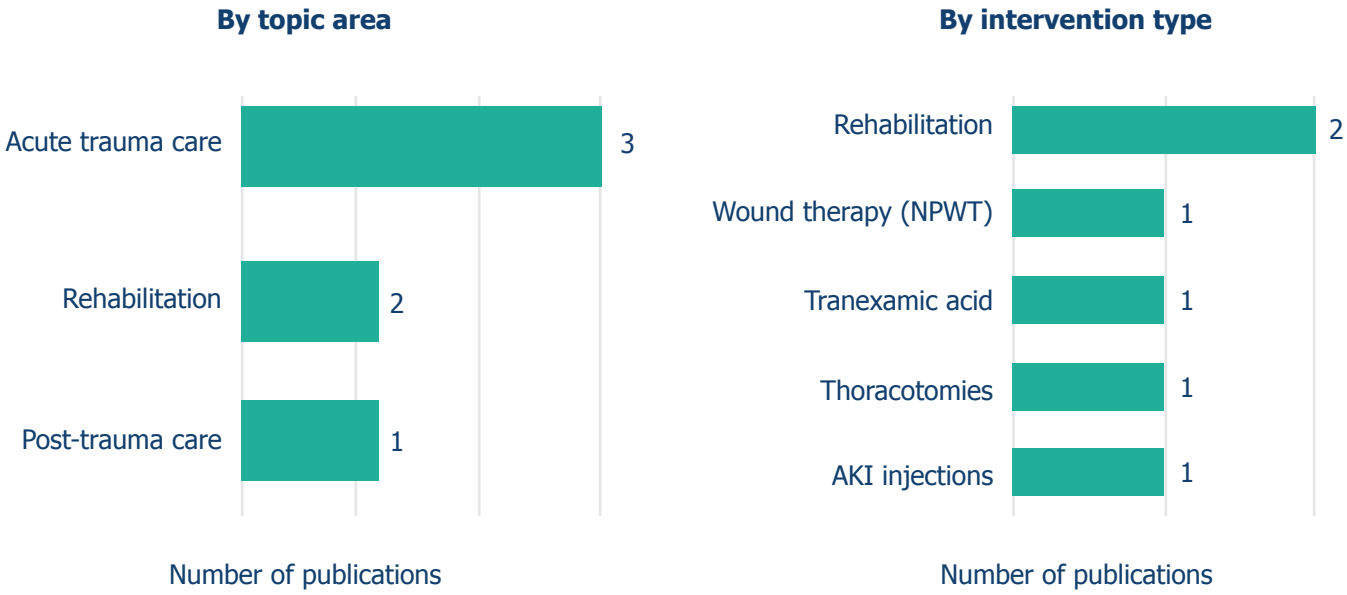
Topical areas and interventions of focus

Topical areas of focus

Articles that assess trauma care interventions accounted for half (n=3, 50%) of the injury and rehabilitation articles.[317–319] Two articles (33%) focused on physical rehabilitation interventions[315,320] and one (17%) on hospital-based post-trauma care (Figure 10.5).[316] Two of the trauma care articles reported on interventions occurring in conflict settings in the Middle East[316,318] and the remaining trauma care article examined an intervention in post-earthquake Haiti (but tended to the general trauma care needs of the population).[317] Two of the three trauma care interventions occurred in non-camp urban settings and one article examined a national sample. All three interventions treated either non-displaced or presumably non-displaced populations that were emergency-affected. Two trauma care interventions targeted patients over the age of 18[316,317] and one focused exclusively on paediatric patients.[318]

Of the two physical rehabilitation articles, both were from Asia; one reported on an intervention implemented after an earthquake (Nepal) and the other was from a conflict setting (Sri Lanka). The rehabilitation intervention in Nepal took place in a rural area and targeted a non-displaced population whereas in Sri Lanka the focus was on urban IDPs.[315,320] The article reporting on a post-trauma care intervention was implemented at two civilian trauma hospitals in Jordan and Iraq, targeting an urban population with acute conflict-related extremity wounds.[319]

Figure 10.5 Injury and rehabilitation research by topics and interventions of focus



*Note: NPWT = negative pressure wound therapy

Interventions of focus

There were four studies focusing on trauma care and two on rehabilitation. The trauma care interventions (n=4) were diverse in nature, focusing on different clinical management concerns, whereas the rehabilitation interventions (n=2) were more similar in nature in that they aimed to improve functioning, though one focused exclusively on spinal cord injuries. All of the injury and rehabilitation articles reported on intervention effectiveness using different indicators and none reported on intervention cost and/or cost-effectiveness.

Trauma care

The four articles focusing on trauma care included a protocol for administering tranexamic acid,[317] administration of paediatric resuscitative thoracotomies,[318] traditional Chinese medicine injections to treat sepsis-induced acute kidney injury[319] and negative pressure wound therapy (NPWT) intervention.[316] All interventions were facility-based, administered by health professionals and had different outcomes of focus.

The study on administration of tranexamic acid as part of haemorrhage protocols was conducted in Haiti among severe trauma patients and retrospectively compared outcomes of similar adult patients before and after adoption of the tranexamic acid protocol; primary outcomes included in-hospital mortality and length of stay. Patients receiving tranexamic acid had significantly lower mortality (OR=0.3, 95 CI: 0.1–0.8) and shorter length of hospital stay (p=0.02) and the study concluded that inclusion of tranexamic acid in haemorrhage protocols was associated with reduced mortality and hospital stay among adults with severe blunt and penetrating trauma.[317]

The paediatric resuscitative thoracotomy study was a retrospective record review comparing children in traumatic arrest undergoing resuscitative thoracotomy to those receiving only cardiopulmonary resuscitation (CPR) as the standard of care in Iraq and Afghanistan. A trend towards higher survival was observed among children who underwent a resuscitative thoracotomy compared to subjects undergoing CPR without thoracotomy (31% vs 9%, p=0.108); however, small sample size and inadequate documentation were challenges. The authors concluded that further research in resource-limited settings was needed to confirm the association.[316]

The study on use of traditional Chinese medicine injections was conducted at a hospital in China among earthquake victims with severe damage to multiple organs and tissues who developed sepsis. The study used a retrospective design where medical records were analysed to assess if patients with sepsis-induced kidney injury who received the Xuebijing injection had improved liver function (as measured by laboratory tests) compared to those receiving the standard of care. The Xuebijing injection is a blood-activating and anti-end-toxicity therapy from traditional Chinese medicine that had been previously used for treatment of sepsis and multiple organ dysfunction. Levels of creatine phosphate kinase, blood urea nitrogen, serum creatinine and interleukin 6 were significantly lower after treatment ($p<0.05$) in both groups and values of those receiving the injection were significantly lower than those in the control group ($p<0.05$), indicating that injections are effective in improving clinical outcomes of sepsis-induced acute kidney injury.[319]

The study of NPWT was an RCT of adult patients with conflict-related extremity wounds at two civilian hospitals in Jordan and Iraq. Outcomes of interest included wound closure, net clinical benefit and prevalence of in-hospital deaths or complications. No significant differences were observed between the NPWT and standard treatment groups. The authors concluded that NPWT did not yield superior clinical outcomes and should not be adopted in resource-limited settings as it is a costly intervention without demonstrated effectiveness in these contexts.[316]

Rehabilitation

There were two studies focused on rehabilitation: a community-based rehabilitation intervention for earthquake injuries implemented by physiotherapists;[3] and a spinal cord injury rehabilitation programme implemented by a mix of health professionals (mental health specialist, nurse, doctor and physiotherapist) with support from lay personnel (a logistician) that compared facility- and community-based interventions.[320]

The community-based rehabilitation study was conducted in post-earthquake Nepal and evaluated a community-based rehabilitation protocol for physically impaired earthquake victims. A total of 13 subjects with differing impairments received 12 rehabilitation sessions over a two-week period. Outcome measures included the World Health Organization Disability Assessment Schedule, a pain

rating scale and the Timed Up and Go test (TUG), which is a measure of mobility. Both disability levels (effect size=0.63, $p<0.001$) and pain levels ($p=0.007$) decreased significantly over the course of treatment; however, change in mobility was not significant. The authors concluded that evidence-based, structured community rehabilitation protocols demonstrated benefits in improving the quality of life for earthquake victims.[319]

The spinal cord rehabilitation study was conducted in Sri Lanka among 89 IDPs with spinal cord injuries admitted to the multidisciplinary rehabilitation programme. Outcome measures included discharge to the community and change in Spinal Cord Independence Measure II (SCIM) scores on discharge. The majority of patients (83.2%) were able to be discharged to the community and there was a significant increase in SCIM score from admission to discharge (55 to 71, $p<0.01$). Clinically significant SCIM score improvement was demonstrated in 79.8% of patients. The authors concluded that provision of effective spinal cord injury rehabilitation is possible in complex humanitarian emergencies.[320]

Cumulative summary of recent injury and rehabilitation publications

Together, HHER1[2] and HHER2 identified 53 articles published across the combined 1980–2021 review period that report on effectiveness and/or costs of injury and rehabilitation interventions in humanitarian settings (Figure 10.6).[4] Comparison of articles included in HHER1 and HHER2 suggests a noticeable decrease in the volume of research on injury and rehabilitation in recent years but also a significant shift in focus of interventions.

Changes in research between the review periods

HHER1 identified 47 injury and rehabilitation articles (including one grey literature publication) published across a 34-year period, while HHER2 found only six articles published in an eight-year time frame. The average number of annual publications was 1.41 in HHER1 (January 1980–April 2013 review period) compared to 0.75 in HHER2 (April 2013–April 2021 review period). The majority of publications in both evidence reviews were observational studies (87% in HHER1 and 83% in HHER2). HHER1 included five quasi-experimental trials and one economic evaluation; neither of these study designs were present in the articles included in HHER2. HHER2 included an experimental trial, which was absent from HHER1. Neither review identified mixed-methods studies that met inclusion criteria.

In both HHER1 and HHER2, studies conducted in Asia accounted for the largest number of articles on injury and rehabilitation interventions, followed closely by the Middle East. HHER1 included 14 articles from Eastern Europe, a region that was not represented in HHER2, seemingly due to the resolution of conflict in former Yugoslavia. In both reviews, the majority of papers reported on interventions that were implemented in response to armed conflict; and the remaining studies examined interventions responding to environmental disasters, particularly earthquakes. In the absence of consistent disaggregation of study target populations by displacement status, articles published between 1980 and 2021 focused predominantly on the general population.

The majority of articles in HHER1 assessed interventions focused on orthopaedic care. HHER2 identified a more diverse range of topics including trauma care interventions (cardiac, renal and vascular care), as well as rehabilitation interventions (general and spinal). Both reviews included articles reporting on vascular and renal injuries, as well as multiple or non-specific injuries; however, only HHER1 included studies assessing abdominal/thorax, cranial-facial and nerve pain treatments. The majority of articles in HHER1 assessed surgical interventions; articles reporting on pre-hospital care and triage, surgical fixations, amputation, and renal therapy and/or fasciotomy were also included, but comparatively few studies (n=4) addressed rehabilitation.

Figure 10.6 Comparison of injury and rehabilitation research across evidence reviews

Study design and quality	HHER1 (1980–2013) 47 articles	HHER2 (2013–2021) 6 articles
Study design		
Experimental	-	1
Quasi-experimental	5	-
Observational	**41**	**5**
Mixed-methods	-	-
Economic evaluation	1	-
Study quality		
Low risk of bias	Comparable quality assessment not completed in HHER1.	**3**
Moderate risk of bias		-
High risk of bias		1
Unclear risk of bias		2
Study characteristics		
Region		
Africa	2	-
Asia	**16**	**3**
Latin America/Caribbean	-	1
Middle East	13	2
Europe	14	-
Multiple	1	-
Crisis type		
Armed conflict	**29**	**3**

Environmental disaster	18	2
Multiple	-	1
Population type		
Internally displaced	-	1
General population	**47**	5
Multiple	-	-

HHER1 (1980–2013)		HHER2 (2013–2021)	
Study topics and interventions			
Topic area			
Abdominal/thorax	5	Cardiac	1
Orthopaedic	**15**	Renal	1
Cranio-facial	5	Spinal cord	-
Nerve pain	3	Vascular	1
Vascular injury	13	Multiple/non-specific injury	**2**
Multiple/non-specific	6		
Intervention type			
Pre-hospital care/triage	2	Pre-hospital care/triage	**2**
Surgery (including 6 surgical fixation)	**28**	Wound therapy	1
Renal care/fasciotomy	9	Renal care	1
Amputation	4	Rehabilitation	**2**
Rehabilitation	4		

Injury and rehabilitation evidence gaps

Most of the injury and rehabilitation studies identified in HHER2 are from conflict and earthquake settings in Asia and to a lesser extent the Middle East,[4] which reflects the types of events that yield severe injuries requiring intensive interventions. HHER1 discussed the need for further research to be conducted during humanitarian crises in Africa and in the Americas. In HHER2, no articles reported on injury and rehabilitation interventions in Africa and only one study was from the Americas (Haiti). Given the widespread impact of armed conflict across regions, further research on both pre-hospital and hospital trauma care, as well as longer-term rehabilitation programmes, should be considered a priority and aligned with contexts in which traumatic injuries and rehabilitative needs have a greater incidence.

HHER1 also expressed the need for more research to be completed during environmental disasters and among refugee populations.[4] When examined by setting, environmental disasters accounted for 38% and 33% of injury and rehabilitation research in HHER1 and HHER2, respectively, with earthquakes being the most frequently represented disaster type. There were no studies conducted in refugee contexts in either review; however, it could be presumed that trauma care is less relevant in these settings and is unlikely to be a priority in refugee contexts given that the risk of violence and conflict is often minimised by displacement away from such contexts. Studies on rehabilitation, which may be more relevant, may also be more difficult to identify in settings where refugee healthcare is integrated into existing health systems, meaning that they may be included in the research but that publications from refugee-hosting countries with mixed participants might not be identified in literature on humanitarian contexts. While there was a paucity of research focused exclusively on refugees in HHER2, future studies should not necessarily be prioritised among refugees. Refugees do not face increased injury risk and capacity to address injury is likely to be greater in refugee settings compared to acute phase emergencies. However, refugees do have differing vulnerabilities and health access challenges, which are important considerations with respect to rehabilitation and post-injury functioning.

Authors of HHER1 noted there was an abundance of evidence on surgical interventions and that more research is needed on other aspects of injury and rehabilitation, which accounted for only four (8.5%) of the publications in HHER1.[4] HHER1 commented on several gaps in the evidence base, noting the need for more research to determine the effectiveness and cost-effectiveness of rehabilitative interventions, in particular for physical disabilities.[4] Considering that only two publications on rehabilitation were identified in HHER2, this area of focus remains a critical gap in the literature.

HHER1 also called for more higher-quality studies that assess longer-term health outcomes.[4] In HHER2, half of the studies were judged to have a low risk of bias and only one a high risk, suggesting that quality of recent evidence is mixed. With regard to assessment of longer-term outcomes, most of the HHER2 studies had a follow-up period lasting only weeks or months, suggesting that this limitation persists in the current literature, though half of the articles included in HHER2 focused on trauma care where short-term follow-up may be sufficient. In the remaining studies on wound care and rehabilitation, longer-term follow-up measures would be appropriate but, with one exception, were not assessed. Use of longer-term outcome measures for selected interventions (such as rehabilitation) and incorporation of economic evaluations persist as evidence gaps in HHER2.

Only one relevant review of injury and/or rehabilitation interventions in humanitarian settings since HHER1 was identified. The review focused on trauma and injury care for women and children in conflict settings. It overlapped with HHER1 and included literature published between 1990 to 2018; 81 articles were identified, most of which were observational (retrospective chart reviews of surgical patients). Traumatic injuries require a wide range of medical and surgical interventions, and effectiveness largely depends on prompt and timely management and referral, with appropriate rehabilitation services and post-treatment follow-up. In addition, children may require additional specialised care. The review called for further research to evaluate injury and rehabilitation intervention delivery in conflict settings, particularly among children, and in different population displacement contexts.[321]

Recommendations for future injury and rehabilitation research

Based on the synthesis of recent peer-reviewed publications, gaps in the evidence base for injury and rehabilitation, research in humanitarian contexts that should be prioritised for future research include the following:

- The low number of publications identified in the review suggests **there is a need to expand research on injury and rehabilitation in humanitarian crises generally**, particularly given that traumatic injuries are prevalent in conflict settings, which account for a substantial proportion of humanitarian crises.

- Given the extensive need for rehabilitation in both post-environmental disaster and conflict settings and the limited evidence base, **research on injury rehabilitation programmes is an important gap in the recent literature**, though it should be noted that rehabilitation and orthopaedic care accounted for most articles in HHER1. Rehabilitation is critical for improving post-injury functioning and more research is needed on how to best provide and integrate rehabilitation as part of the health response.

- **Incorporation of longer-term outcome, social and economic measures** should be a priority given these were persistent gaps in both HHER1 and HHER2.

- Finally, **injury and rehabilitation research in Africa was noted as significant gap** in both reviews. Given the many ongoing conflicts in the region, Africa should be considered a geographic area of focus for injury and rehabilitation research.

11
Health Service Delivery

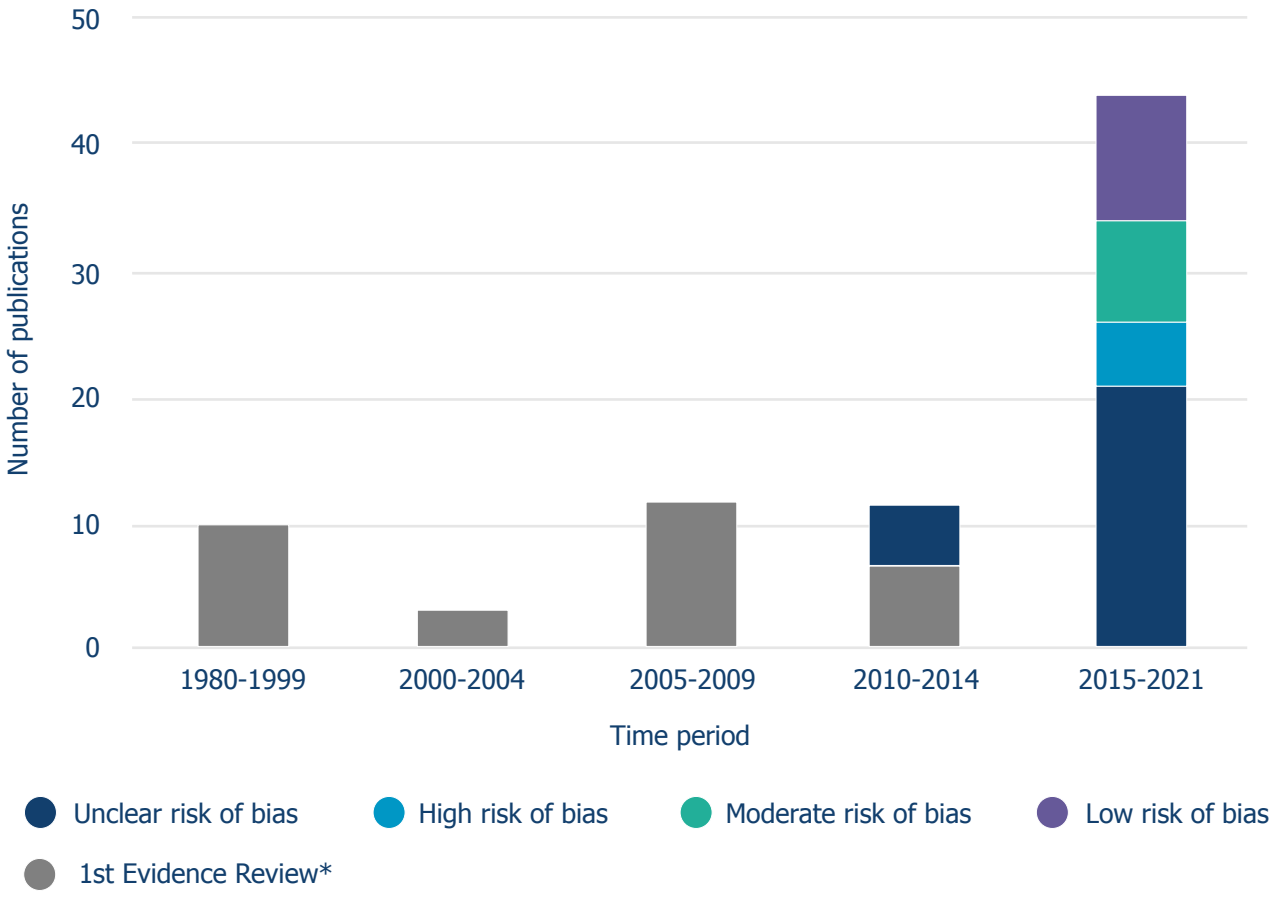
11. HEALTH SERVICE DELIVERY

56 Peer-reviewed publications in 8 years

Overview of literature search findings

Of the 269 peer-reviewed articles meeting eligibility criteria across all topic areas, 56 (21%) reported on evaluations of health service delivery strategies. Fifty-one (19%) articles evaluated health service delivery strategies focused on a specific health area and are also included in reviews in the preceding chapters. Fourteen (5%) articles evaluated system-level interventions or health workforce capacity strengthening to improve health service delivery; or evaluated the effectiveness of service delivery at scale and are also included in the review of effectiveness of Health Systems interventions. The 56 peer-reviewed health service delivery articles present findings from 54 distinct studies; a detailed summary of included studies is presented in Annex 13. Five articles were published from 2013–2014, 16 were published in 2015–2017 and 35 in 2018–2021. The number of health service delivery articles published in the past eight years is 1.8 times the number of articles included in the first evidence review (n=32), which spanned a 32-year period.± This progression in publication volume is illustrated in Figure 11.1.

Figure 11.1 Quantity and quality of health service delivery publications over time



*Non-comparable quality appraisal was conducted in HHER1 (1980-2013).

± HHER1 data presented in this chapter also includes "category C" studies, in which output (rather than outcome) measures were reported. The same is the case in the Nutrition chapter. All other chapters report "category A" (health-related outcomes measures with statistical tests) and "category B" (health-related outcomes measures without statistical tests) studies only.

Study designs and research quality

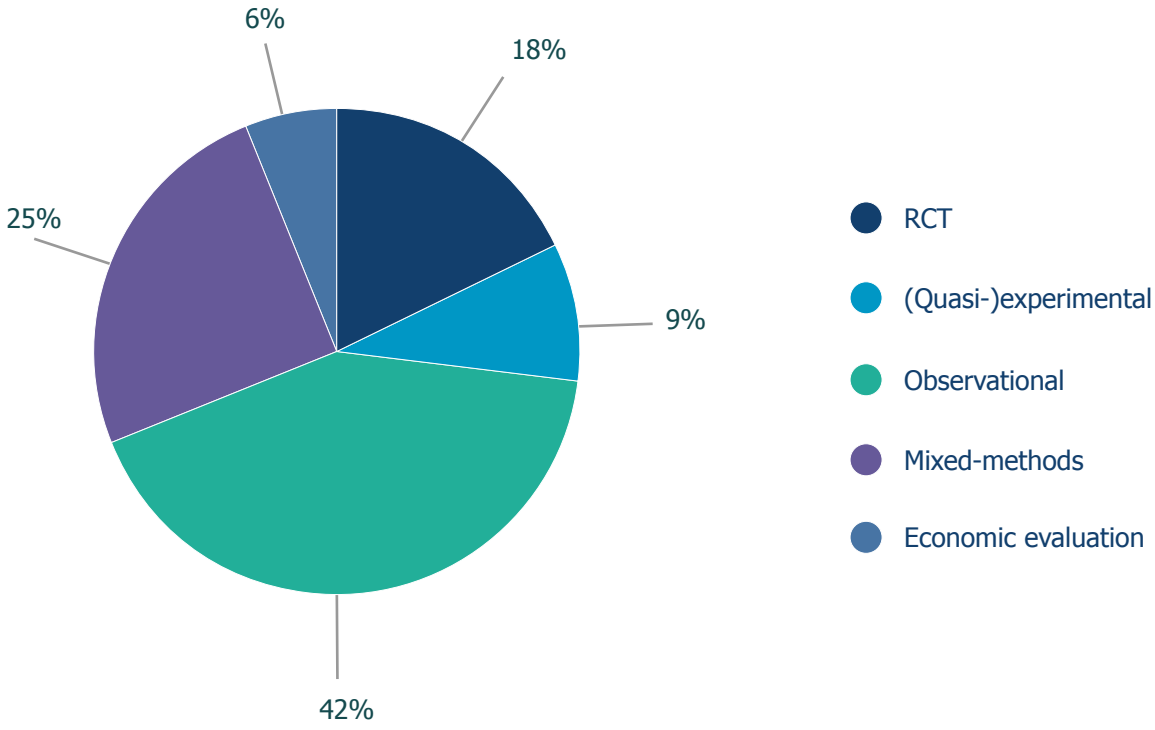
Included articles were categorised by study design and risk of bias was assessed accordingly for each article. A summary of study design and quality appraisal findings follows.

Study designs

Experimental and quasi-experimental studies accounted for 13 (23%) included studies, observational studies 24 (42%) and mixed-methods studies 15 (27%) (Figure 11.2). Four of the 15 mixed-methods evaluations were experimental studies with both quantitative and qualitative components, one was an experimental study and economic evaluation, and ten were mixed-methods studies employing both observational quantitative and qualitative methods. The remaining four (6%) health service delivery articles were economic evaluations.

Sample sizes ranged from 12 (patients with type 2 diabetes enrolled to evaluate mobile health for diabetes management)[300] to 7,071 (pregnant women who received one of three strategies for Hepatitis B Virus transmission prevention);[87] 12 (21%) of the 56 studies had a sample size greater than 500 subjects and 14 (25%) studies had a sample size smaller than 100 subjects.

Figure 11.2 Health service delivery research by type of study design

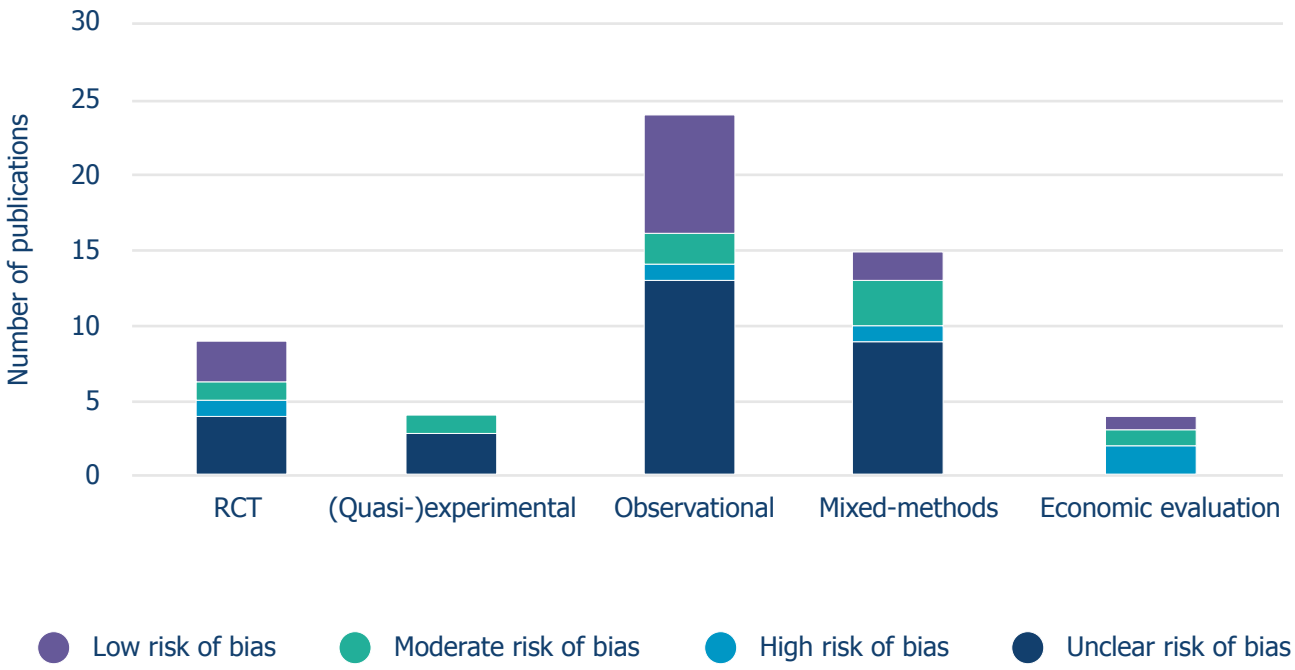


Quality appraisal

Twenty-seven (48%) of the 56 articles reporting on evaluations of health service delivery strategies included sufficient information to make a judgement on the risk of bias. Fourteen (25%) articles were judged to have a low risk of bias for their study design, eight (14%) a moderate risk and five (9%) a high risk. The remaining 29 (52%) articles were determined to have an unclear risk of bias.

Risk of bias by study design is presented in Figure 11.3. Three of the nine articles reporting on RCTs had a low risk of bias, one a moderate risk and one a high risk. The remaining four articles reporting on RCTs had an unclear risk of bias. For the four articles reporting on quasi-experimental studies, one was classified as having a moderate risk of bias and the remaining three an unclear risk. Out of the 39 observational and mixed-methods studies, which accounted for two-thirds of the included articles, ten were classified as having a low risk of bias, five a moderate risk, two a high risk and the remaining 22 an unclear risk. One of the economic evaluations had a low risk of bias, one a moderate risk and two a high risk.

Figure 11.3 Risk of bias in health service delivery publications, by study design



Research location, setting and population type

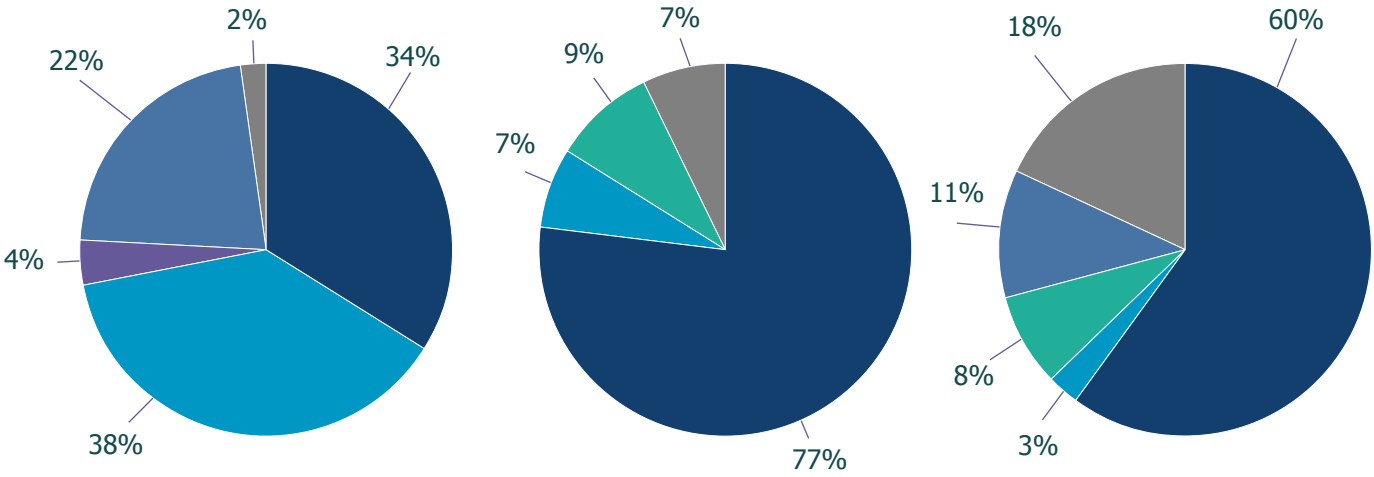
The location, setting and population type of study for health service delivery research in humanitarian contexts is summarised in Figure 11.4; a map of countries in which health service delivery research was conducted is provided in Annex 4. The largest proportion of health service delivery articles reported on interventions in Asia, with 21 (38%) articles, followed by Africa (n=19, 34%), the Middle East (n=13, 23%), and Latin America and the Caribbean (n=2, 4%). One article (2%) reported on interventions in both Africa and the Middle East.

The majority of health service delivery articles (n=43, 77%) reported on interventions in areas affected by armed conflict. Four (7%) articles reported on interventions in areas affected by environmental disasters and five (9%) reported on interventions in areas affected by disease outbreaks. Four (7%) articles reported on interventions in areas affected by multiple types of crises.

Slightly more than one-third of articles (n=22, 39%) reported on interventions implemented in rural areas, compared to 18 (32%) articles that reported on interventions implemented in urban areas and seven (13%) in both urban and rural areas. Urban vs rural setting was not specified in nine (16%) articles. More than two-thirds of articles (n=41, 73%) reported on interventions implemented in non-camp settings. Six (11%) articles reported on interventions implemented in camp settings, six (11%) reported on interventions implemented in both camp and non-camp settings, and three (5%) did not specify either camp or non-camp setting.

Nearly half of the health service delivery articles (n=23, 41%) reported on interventions for emergency-affected (non-displaced) populations. Five (9%) articles reported on interventions for refugee populations, three (5%) for IDPs, one (2%) for host community members and seven (13%) for multiple population types.

Figure 11.4 Distribution of health service delivery publications by region, crisis and population type



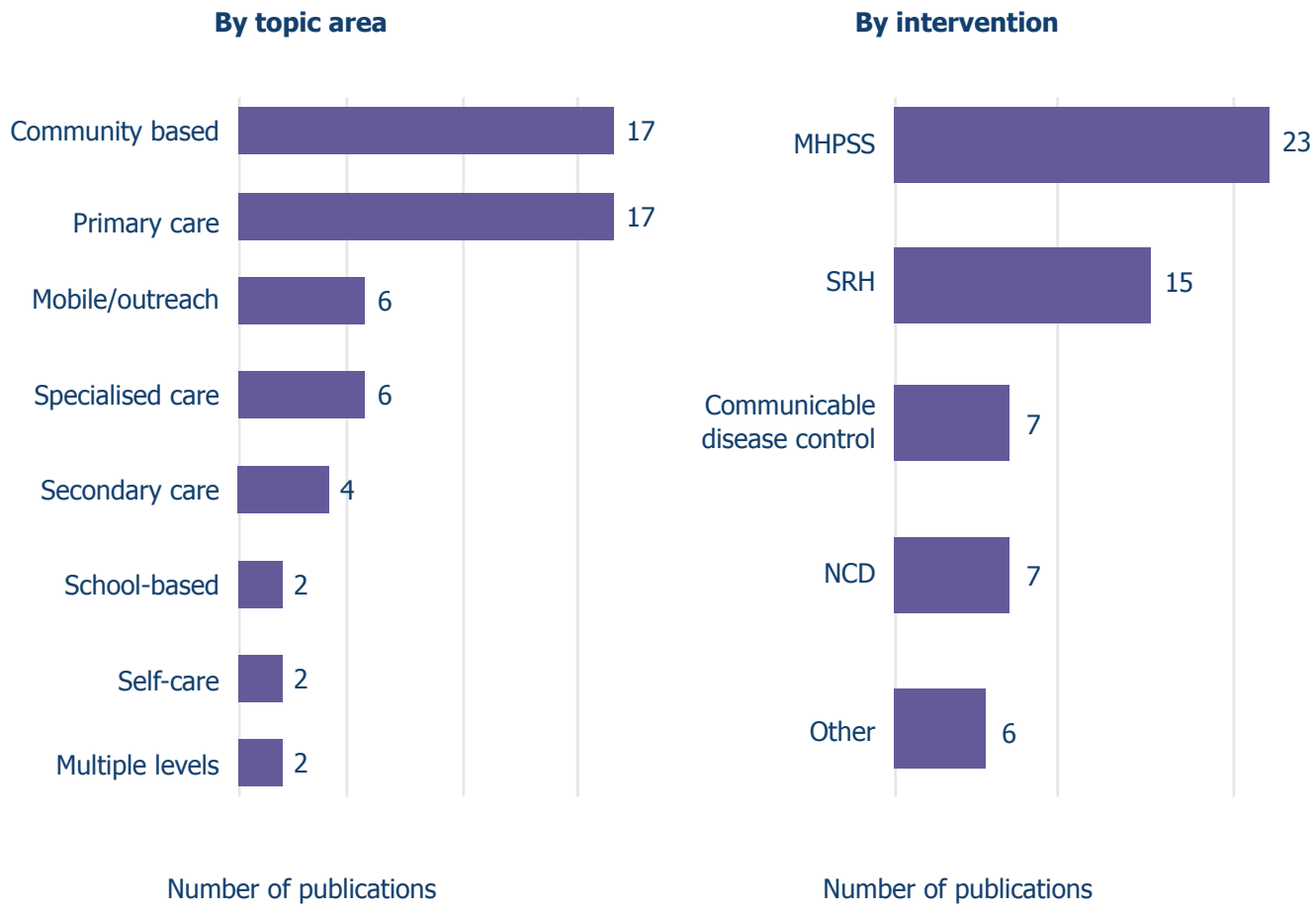
Levels of care and interventions of focus

Levels of care

Figure 11.5 presents an overview of the distribution of topics and interventions across articles reporting on health service delivery interventions. To facilitate analysis across HHER2 topic areas and allow meaningful comparison of health service delivery articles between HHER1 and HHER2, included articles were categorised according to level of care (community-based; mobile/outreach; facility-based primary care at health centres and/or district hospitals; secondary care; and specialised care) and intervention type (communicable disease control; WASH; nutrition; SRH; MHPSS; injury and rehabilitation; and NCDs).

The majority of health service delivery articles reported on primary care interventions at health facilities (n=17, 30%), through mobile teams or outreach interventions (n=6, 11%), and at schools (n=2, 4%) or in the community (n=17, 30%). Two (4%) articles reported on community-based commodity distribution and counselling to facilitate self-care. Four (7%) articles reported on secondary healthcare interventions and six (11%) on specialised healthcare delivery.

Figure 11.5 Health service delivery research by topic areas and interventions

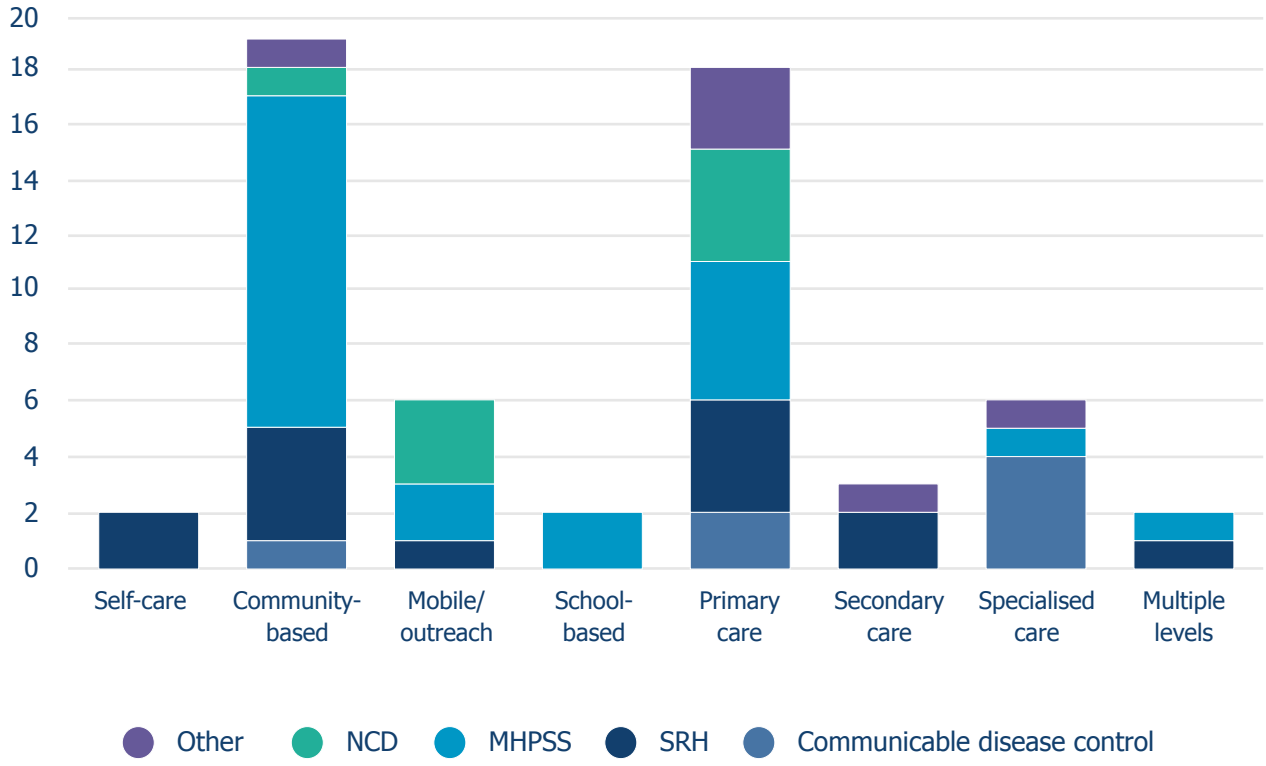


*Categories are not mutually exclusive.

Community-based, mobile/outreach and primary care service delivery

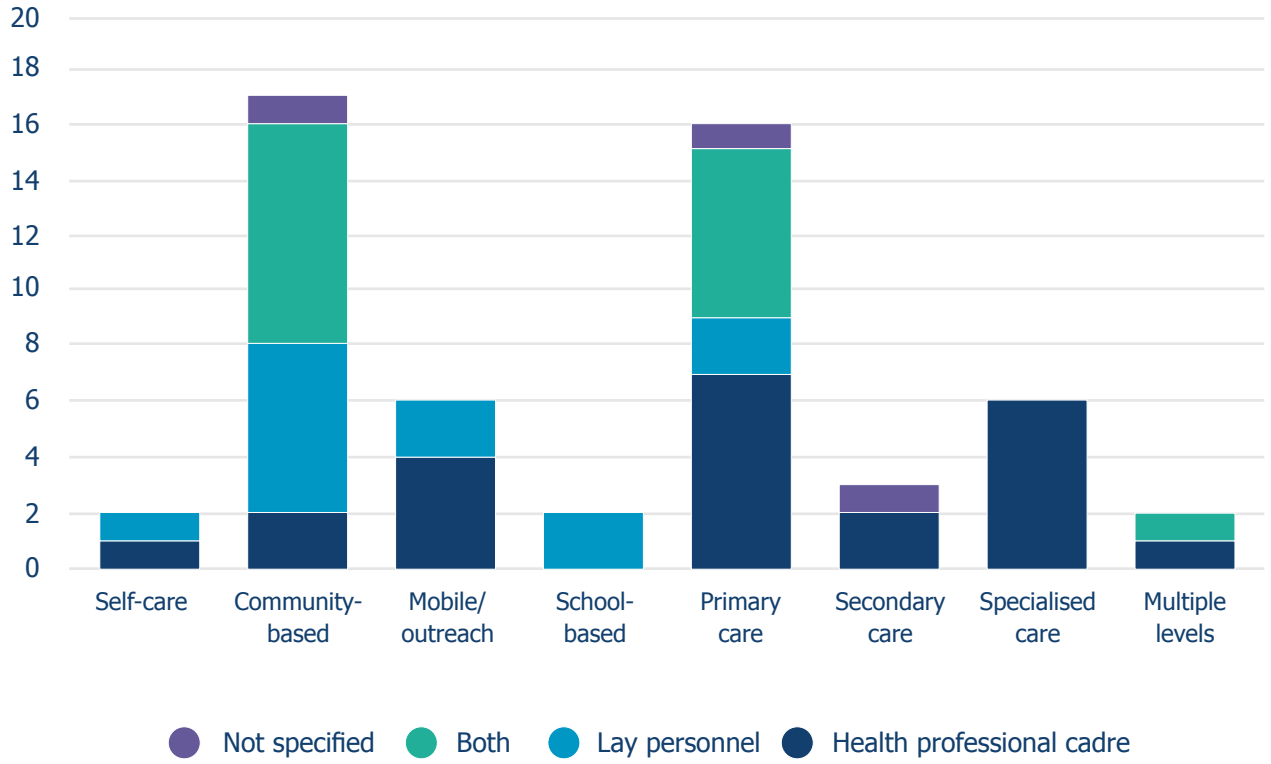
Articles reporting on self-care support, community-based health services and school-based health services included evaluations of MHPSS (n=14, 25%),[153,159,195,222,225,236,239,246,248,250,256,261,263,270] SRH (n=6, 11%)[95,153,155,158,159,172] and NCD (n=1, 2%)[310] interventions; and of a community development programme funding community health infrastructure improvements (n=1, 2%) (Figure 11.6).[96]

Figure 11.6 Types of health service delivery intervention evaluated by levels of care



Of 17 articles focused on community-based health service delivery, three (18%) reported on interventions implemented by health professional cadres, six (35%) on interventions implemented by lay personnel and seven (41%) on interventions implemented by both professional cadres and lay personnel (Figure 11.7). Ten (59%) of the 17 articles focused on community-based health service delivery reporting on MHPSS interventions,[222,225,236,246,248,250,256,261,263,270] one (6%) focused on NCDs[310] and one (6%) on SRH.[158] The remaining five articles on community-based health service delivery reported on interventions classified in multiple topic areas, including maternal mental healthcare,[153,159] integration of nutrition screening with immunisation campaigns,[19] use of social action funds to improve child nutrition and WASH practices,[96] and home-based counselling on infant feeding and WASH practices.[95] Ten (29%) of the 17 articles evaluating community-based service delivery reported on interventions in Asia, while only five (12%) reported on interventions in Africa and two (11%) reported on interventions in the Middle East.

Figure 11.7 Personnel involved in health service-delivery interventions evaluated by levels of care



The two articles reporting on facilitation and support of self-care were evaluations of SRH interventions implemented by health professionals in Thailand (support for self-management of abortion)[172] and lay personnel in South Sudan (support for newborn cord care after home births),[155] while the two articles reporting on school-based health service delivery were evaluations of MHPSS interventions implemented by teachers in Turkey[239] and Nepal.[195]

Three (50%) of the six mobile health and outreach service-delivery articles focused on NCDs (n=3),[300,304,305] two focused on MHPSS (33%)[247,255] and one focused on SRH (17%).[156] SRH mobile teams were staffed by health professionals, while the MHPSS and NCD articles included interventions implemented by health professionals and others implemented by lay personnel. Articles evaluating mobile health teams and outreach interventions reported on interventions in the Middle East (n=4, 67%), Afghanistan (n=1, 17%) and Ethiopia (n=1, 17%).

The 17 articles that addressed facility-based primary healthcare service delivery included evaluations of MHPSS (n=5, 29%),[88,226,241,242,271] SRH (n=4, 24%),[87,151,160,173] NCDs (n=4, 24%),[302,303,306,322] communicable disease control (n=2, 12%)[34,87] and other (n=3, 12%)[323–325] services. Eight (47%) of these articles reported on interventions that were implemented by health professional cadres, two (11%) reported on interventions implemented by lay personnel and six (35%) reported on interventions implemented by both health professionals and lay personnel. One article did not specify the type of personnel involved. Geographically, articles reporting on facility-based primary healthcare service-delivery interventions spanned Africa (n=7, 41%), Asia (n=5, 29%), the Middle East (n=4, 24%) and a multi-country evaluation with sites in both Africa and the Middle East (n=1, 6%).

Secondary and specialised care service delivery

Four (7%) articles reported on evaluations of secondary care interventions [149,154,176,326] and six (11%) reported on specialised care interventions,[41–43,73,160,187,317] all of which were implemented by professional health personnel. Secondary care articles included evaluations of a pharmaceutical service for women with polycystic ovarian syndrome in Syria/Jordan,[176] cost-effectiveness of prenatal screening for congenital TORCH infections among Syrian refugees in Turkey,[149] and costs of caesarean sections and of district hospital surgical services in the DRC.[154,326] The articles that reported on specialised care interventions focused on communicable disease control (n=4) in Sierra Leone[41–43] and Afghanistan;[73] trauma care in Haiti;[317] and mental health in Thailand, Cambodia and Indonesia.[187]

Interventions of focus

Articles evaluating health service delivery approaches reported on effectiveness of a wide range of interventions addressing communicable disease control (n=7, 13%),[19,34,41–43,73,87] SRH (n=15, 25%),[87,95,149,151–156,158–160,172,173,176] MHPSS (n=23, 42%),[88,153,159,187,195,222,225,226,236,239,241,242,246–248,250,255,256,261,263,265,270,271] NCDs (n=7, 15%),[300,302–306,310] and other areas of primary and specialised healthcare (n=6, 9%).[96,317,322,323,325,326]

Thirty-one (56%) articles evaluated the effectiveness of service delivery models; [19,41,88,95,152,153,156,158,172,173,176,195,222,225,226,236,239,241,247,248,255,261,263,265,270,300,302,303,306,310] 17 (31%) evaluated specific protocols, procedures, or clinical decision support tools;[34,42,43,73,87,149,154,155,187,246,247,271,304,305,317,322,324,326] and nine (16%) evaluated health worker capacity-strengthening and quality improvement support interventions.[151,160,195,242,248,250,256,323,325] The remaining article evaluated a community development programme that funded community health infrastructure improvements.[96]

Communicable disease control

Of the seven articles reporting on communicable disease control interventions, four reported on interventions conducted during the Ebola outbreak in Sierra Leone. One was a mixed-methods evaluation of Ebola infection prevention and control measures at primary healthcare facilities.[34] The other three were observational studies evaluating the effectiveness of opening an EMC,[41] evaluating a triage algorithm[42] and evaluating the effectiveness of a rapid diagnostic test at Ebola holding centres.[43] The remaining communicable disease control articles were an observational cohort study evaluating rifampin-resistant tuberculosis treatment regimens at specialised care facilities in conflict-affected Afghanistan;[73] a cross-sectional evaluation of integrating screening for malnutrition in a polio vaccine campaign in conflict-affected areas of Nigeria;[19] and an economic evaluation of strategies for preventing perinatal hepatitis B transmission in refugee camp facilities in Thailand.[87]

Sexual and reproductive health

Of the 15 articles reporting on SRH service-delivery interventions, two (13%) evaluated self-care support interventions;[155,172] five (33%) evaluated community-based or mobile outreach interventions;[95,153,156,158,159] seven (47%) evaluated facility-based services;[87,149,151,154,160,173,176] and one (7%) evaluated a multi-faceted intervention with both community and facility-level components.[152]

Three reported on interventions that were part of broader humanitarian response programmes or maternal and child health service delivery strategies.

Eleven articles evaluated effectiveness of MNH interventions for conflict-affected populations.[87,95,151–156,158–160] Six of these articles evaluated models of care for conflict-affected populations in Asia (two in Afghanistan, two in Bangladesh, one in Pakistan and one in Thailand). These included mixed-methods and observational studies evaluating community-based maternal mental health interventions;[153,159] quasi-experimental and observational studies evaluating home-based counselling on maternal and newborn care practices;[95,158] a quasi-experimental study evaluating maternal and child health services provided by mobile teams of health professionals;[156] and a quasi-experimental evaluation of interventions to strengthen both community- and facility-based maternal healthcare services.[152] Both articles reporting on evaluations in Afghanistan and one of the evaluations in Bangladesh studied intervention effects on antenatal care and postnatal care utilisation (at least one visit with a skilled healthcare provider) and childbirth location (facility birth), among other outcomes.[152,156,158] Apart from these, none of the SRH service-delivery articles reported on similar outcomes. The remaining six MNH service-delivery articles evaluated the effectiveness of clinical audits to improve nuchal cord management;[160] cost-effectiveness of various strategies to prevent perinatal hepatitis B transmission at refugee camp clinics in Thailand;[87] cost-effectiveness of prenatal screening for congenital TORCH infections among Syrian refugees in Turkey;[149] the effectiveness of clinical trainings on newborn care practices at primary healthcare facilities in Somalia;[151] cost-effectiveness of caesarean surgeries at hospitals in the DRC;[154] and effectiveness of an intervention to support newborn cord care after home births in South Sudan.[155]

Two of the remaining articles evaluating SRH service-delivery interventions were mixed-methods evaluations of community-based provision of medication for self-management of medical abortion in refugee and migrant communities along the Thailand/Myanmar border;[172] and of post-abortion care service delivery in multiple conflict-affected countries (DRC, Somalia and Yemen).[173] The final article reporting on SRH service delivery was an RCT evaluating the impact of a pharmaceutical care service on quality of life for women with polycystic ovarian syndrome in Jordan and Syria.[176]

Mental health and psychosocial support

Of the 23 articles reporting on MHPSS service-delivery interventions, 14 (61%) evaluated community-based or mobile outreach service-delivery interventions,[153,159,236,246–248,250,255,261,263,270] two (9%) evaluated school-based interventions,[195,239] six (26%) evaluated facility-based service-delivery interventions,[88,187,226,241,242,271] and one (4%) evaluated a multi-faceted intervention with both community and facility-level components.[265] Three (13%) articles reported on interventions that were part of broader programmes or service delivery strategies.

The majority of MHPSS service delivery evaluations were implemented in Asia (n=13, 57%), with only five (22%) in Africa, four (17%) in the Middle East and one (4%) in Colombia. Community-based and mobile outreach services were provided by lay personnel (n=6, 43%), health professionals (n=2, 14%), or both lay personnel and health professionals (n=6, 43%). Facility-based services were provided by health professionals (n=3, 50%), lay personnel (n=2, 33%), or both lay personnel and health professionals (n=1, 17%). Both school-based interventions were implemented by teachers.

Three of the community and mobile outreach articles[195,248,250] and two of the facility-based intervention articles[219,242] evaluated health worker capacity-strengthening interventions. One article reported on an RCT evaluating MHPSS training for school teachers in earthquake-affected areas of Nepal;[195] and another reported on a quasi-experimental study evaluating psychological first aid training for mental health field staff working with refugee populations in Lebanon.[219] The remaining articles reporting on capacity-strengthening interventions were mixed-methods and descriptive studies evaluating training of lay health workers in earthquake-affected areas of Nepal[248] and conflict-affected areas of India;[250] and evaluating Mental Health Gap Action Programme (mhGAP) training and support for health professionals in refugee camps in Bangladesh.[242]

Three articles reported on evaluations of digital health solutions. One article reported on a descriptive evaluation comparing the feasibility of refugee depression screening via SMS with screening via face-to-face consultations in South Africa;[271] and another reported on a descriptive evaluation of a mobile application with patient registration, guideline reference, blended learning for lay and professional health workers, and teleconsultation capability in Afghanistan.[246] The third article reported on an RCT evaluating web-based psychotherapy services for war-traumatised patients in Iraq.[247]

The remaining MHPSS service-delivery articles evaluated various models of focused non-specialised support, defined in IASC guidelines as care provided by trained and supervised workers, including general (non-specialised) social and primary health services.[188] Five articles reported on evaluations of Group Problem Management Plus interventions. These included three articles reporting on experimental evaluations in conflict-affected areas of Pakistan,[88,241,261] including one focused on cost-effectiveness of the intervention,[241] as well as mixed-methods studies in earthquake-affected areas of Nepal[263] and conflict-affected areas of the Central African Republic.[236] Two studies reported on RCTs of other group-based MHPSS interventions for conflict-affected populations.[222,270] Four articles reported on evaluations of individual treatment approaches. These included an RCT of community-based implementation of the transdiagnostic CETA for refugees in Thailand;[225] a mixed-methods evaluation of the CETA for refugee young people in Ethiopia;[255] an observational study of a treatment model implemented by teams of lay and professional health workers in a conflict-affected area of India;[250] and an observational study evaluating EMDR treatment for patients affected by environmental disasters in Cambodia, Indonesia and Thailand.[187] Other models of care evaluated included community-based maternal mental health interventions[153,159] and school-based interventions[195,239] described above. Only four of the articles evaluating MHPSS service-delivery approaches reported on efforts to integrate MHPSS into primary healthcare services; three were observational studies in conflict-affected settings (Palestine – Gaza Strip, Bangladesh and Colombia)[226,242,265] and one was a mixed-methods evaluation in earthquake-affected areas of Nepal.[248]

Non-communicable diseases

Of the seven articles reporting on NCD service delivery, four (57%) evaluated community-based or mobile outreach services;[300,304,305,310] and three (43%) evaluated facility-based service-delivery approaches and protocols.[302,303,306] Five of the eight articles reported on stand-alone interventions and two reported on interventions that were part of a broader programme. One article studied an intervention for unspecified chronic medical conditions more broadly, while the remaining articles focused on specific NCDs, namely diabetes and/or hypertension (n=6).

Only one (15%) of the articles evaluating NCD service delivery reported on a diabetes and hypertension intervention in the DRC. The remainder reported on interventions in the Middle East. One (14%) article reported on interventions implemented by lay personnel, five (71%) reported on interventions implemented by health professionals and one (14%) reported on an intervention implemented by both health professionals and lay personnel.

Two of the four NCD service-delivery articles evaluating community-based or mobile outreach interventions were RCTs. One evaluated an at-home medication management review service for refugees in Jordanian cities[310] and the other evaluated an mHealth application for diabetes management in Iraqi cities.[300] The remaining two articles were descriptive evaluations of an mHealth application for diabetes and hypertension screening in rural refugee and host communities in Lebanon.[304,305]

The three articles evaluating facility-based NCD service delivery were all descriptive or mixed-methods evaluations. One was a cohort study evaluating a model of care for diabetes and hypertension treatment in a refugee camp in Lebanon.[302] The remaining two articles were mixed-methods studies evaluating integration of hypertension and diabetes management into emergency primary care services in the DRC;[303] and a multicomponent intervention to advance the level of care and management of hypertension and diabetes at primary healthcare centres Lebanon.[306]

Other primary care and specialised services

Seven articles reported on other primary and specialised service-delivery interventions. One was a quasi-experimental study evaluating the impact of a community development programme that funded health infrastructure improvements in Angola;[96] one was a mixed-methods evaluation of a tool for measuring quality of primary healthcare services in contented areas on the South Sudan/Sudan border;[325] one was an analysis of the cost-effectiveness of prenatal screening for congenital TORCH infections among Syrian refugees in Turkey;[149] and one was an analysis of district hospital surgical costs in the DRC.[326] The remaining three articles were observational studies evaluating use of a paediatric clinical decision support tool in Nigeria,[324] trauma management protocols in Haiti[317] and a training programme for general practitioners serving refugee clients in Jordan.[323]

Cumulative summary of recent health service delivery publications

Together, HHER1[2] and HHER2 identified 88 articles published between 1980 and April 2021 that report on effectiveness of health service delivery interventions in humanitarian settings.* Comparison of articles included in HHER1 and HHER2 suggests an increase in volume and diversity of findings in recent years.

*HHER1 data presented in this chapter also includes "category C" studies, in which output (rather than outcome) measures were reported. The same is the case in the Nutrition chapter. All other chapters report "category A" (health-related outcomes measures with statistical tests) and "category B" (health-related outcomes measures without statistical tests) studies only.

Changes in research between the review periods

Key differences in the studies included in HHER1 and HHER2 are presented in Figure 11.8. HHER1 found 32 health service delivery articles across 32 years,* while HHER2 identified nearly twice the number of articles in a third of that time. All health service delivery articles included in HHER1 were observational studies. Although observational studies were the most common study design in HHER2 articles reporting on health service delivery interventions, more than half of the included articles were experimental, quasi-experimental and mixed-methods studies. In both HHER1 and HHER2, interventions took place in multiple regions, with a predominance in the Middle East and Asia in HHER1, and in Africa and Asia in HHER2. While articles included in HHER1 were fairly evenly split across settings affected by armed conflict and environmental disasters, the majority of studies included in HHER2 were implemented in conflict-affected settings.

Both HHER1 and HHER2 included articles evaluating health service delivery interventions at multiple levels of the health system. In HHER1, the majority of included articles focused on primary and secondary care interventions. In contrast, articles included in HHER2 were comparably split between facility-based care (including primary, secondary and specialised care) and community-based or outreach services, which were not evaluated in HHER1. Despite increasing attention on self-care in recent years, particularly since the start of the COVID-19 pandemic, there does not appear to have been a notable increase in research on self-care as a model of care in humanitarian settings; HHER1 included only one article and HHER2 included two articles evaluating interventions to facilitate or support self-care.

HHER1 and HHER2 used different typologies for classifying the types of health service delivery interventions evaluated. Apart from articles focusing on injury and trauma care, HHER1 classified articles as addressing either general or specific health needs, with interventions addressing general health needs accounting for the majority of articles not related to casualty management. In contrast, the vast majority of articles included in HHER2 focused on specific health needs such as MHPSS or SRH services. At least one health service delivery evaluation was identified for each of the thematic areas in HHER2, with the number of included studies in each topic roughly proportional to the volume of included studies overall. To that end, the most common type of service delivery studied was MHPSS, followed by SRH, NCDs and communicable disease control.

Health service delivery evidence gaps

HHER1 identified a need for evaluations of humanitarian health service delivery models and packages of care, as well as for studies documenting changes in health service delivery and outcomes over time. Although a notable proportion of health service delivery articles included in HHER2 evaluated models of care, the heterogeneity of interventions, study designs and outcomes make it difficult to synthesise findings and evidence gaps.

*Inclusive of "category C" (output measures only) studies.

Figure 11.8 Comparison of health service delivery research across evidence reviews

Study design and quality	HHER1 (1980–2013) 32 articles	HHER2 (2013–2021) 56 articles
Study design		
Experimental	-	9
Quasi-experimental	-	4
Observational	**32**	**24**
Mixed-methods	-	15
Economic evaluation	-	4
Study quality		
Low risk of bias	Comparable quality assessment not completed in HHER1.	14
Moderate risk of bias		8
High risk of bias		5
Unclear risk of bias		**29**
Study characteristics		
Region		
Africa	2	19
Asia	8	**21**
Latin America/Caribbean	4	2
Middle East	**11**	13
Europe	5	-
Multiple	2	2
Crisis type		
Armed conflict	14	**43**
Environmental disaster	**18**	4
Outbreak	-	5
Multiple	-	4

Population type		
Refugee	Comparable assessment by population type not completed in HHER	5
IDP		3
Non-displaced		**23**
Host community		1
Multiple		7
Study topics and interventions		
Topic area		
Self-care	1	2
Community-based care	-	**19**
Primary care	6	17
Secondary care	**17**	4
Multi-level	6	2
Mobile/outreach	0	6
Specialised care	-	6
Ambulatory	2	-

Few studies evaluated the effectiveness of health service delivery interventions for specific subpopulations, such as adolescents, survivors of GBV or people with disabilities. Another recent systematic review also found a sparse evidence base from which to derive context-specific guidance on health service delivery strategies, noting gaps in the literature on how health interventions are delivered for different subpopulations; and what coverage and effectiveness are achieved in conflict settings with varying degrees of insecurity and other humanitarian access constraints.[327] Recent reviews of health and nutrition services provided by community health workers,[328] midwives[329] and mobile clinics[330] in humanitarian settings similarly found few multi-country studies; and few studies comparing models of care or using similar study designs to replicate evaluations of delivery strategies in different settings. Very few studies in HHER1 and HHER2 referred to global or national service-delivery standards and packages of care or described resilience of established service-delivery models amid changes in health system capacity or operating conditions. Only five studies evaluated service-delivery costs or cost-effectiveness. Topic-specific reviews have similarly noted a need for greater focus on implementation, scale-up and sustainability of service-delivery models.[291,298,331-333] These considerations all remain persistent gaps across health service delivery topic areas and levels of care.

Recommendations for future health service delivery research

Based on the synthesis of recent peer-reviewed publications, recommendations for health service delivery research in humanitarian contexts that should be prioritised include the following:

- Given the limited volume of research on resilience, sustainability and scalability of service-delivery strategies, there is a need for **more multi-site, larger-scale and longer-term research on effective models of care for people affected by humanitarian crises.**

- Evidence on the **effectiveness of models of care for different subpopulations** is also lacking and is important to consider when evaluating service delivery at scale.

- There is a need for **more systematic reporting on interventions to strengthen health service delivery and packages of care** (including descriptions of intervention components, processes and implementing environments) to facilitate comparisons of intervention effectiveness across settings. Use of reporting checklists such as the TIDierR Checklist[334] or development of reporting checklist adaptations specific to research on interventions in humanitarian settings could improve the quality of publications and evidence synthesis.

- More rigorous **research on the effectiveness and costs of both focused and integrated models of community- and facility-based care is needed. Use of implementation research frameworks and mixed-methods study designs** could enrich understanding of what works for which populations and settings and why.

12
Health Systems

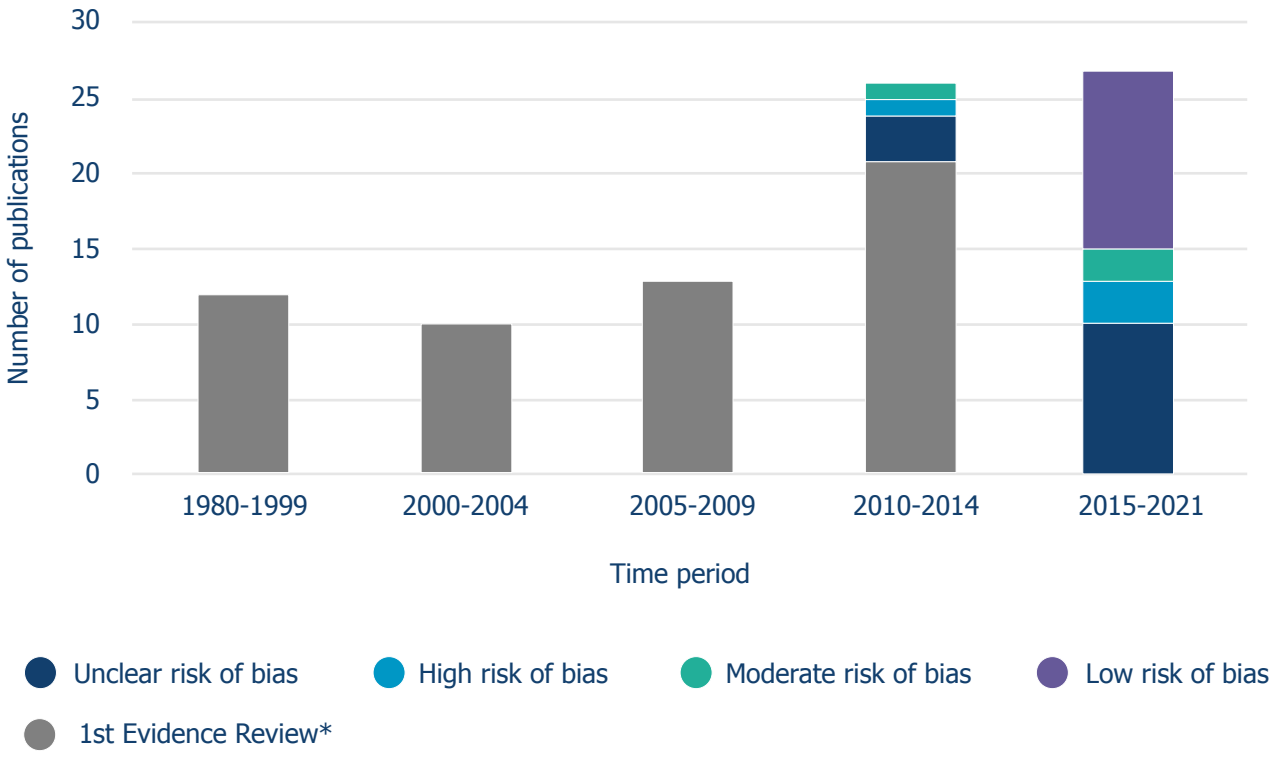
12. HEALTH SYSTEMS

32 Peer-reviewed publications in 8 years

Overview of literature search findings

Of the 269 peer-reviewed articles meeting eligibility criteria across all topic areas, 32 (12%) reported on health systems. The 32 peer-reviewed articles all present findings from distinct studies; a detailed summary of included studies is presented in Annex 14. The number of health systems articles published in the past eight years is just over half the number (n=56) included in HHER1, which spanned a 32-year period, but relatively similar to the previous eight-year period. This progression in publication volume is illustrated in Figure 12.1.

Figure 12.1 Quantity and quality of health systems publications over time



*Non-comparable quality appraisal was conducted in HHER1 (1980-2013).

Study designs and research quality

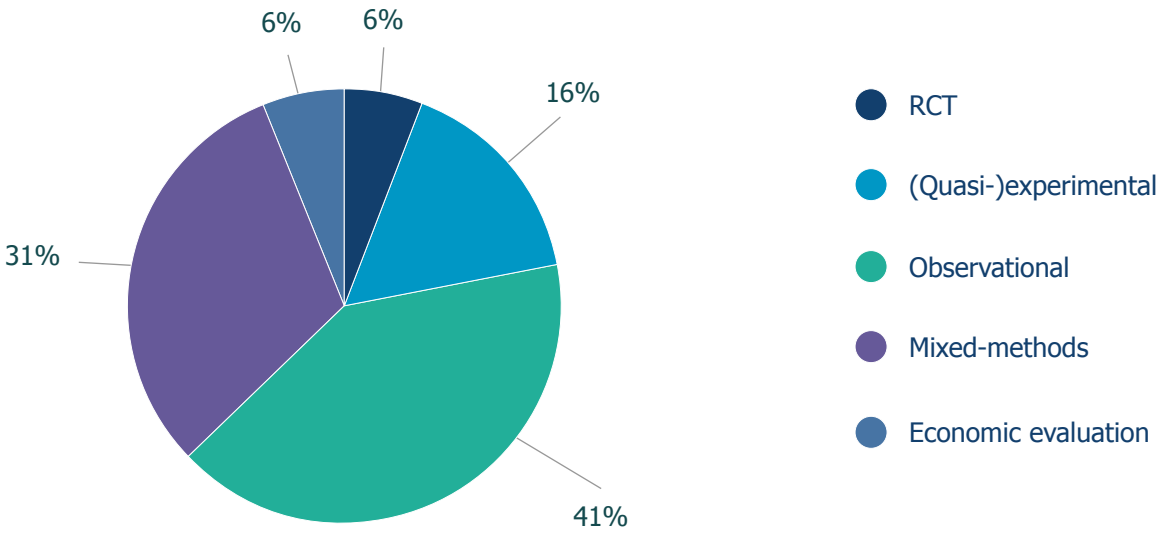
Included articles were categorised by study design and risk of bias was assessed accordingly for each article. A summary of study design and quality appraisal findings follows.

Study designs

The most common study design among articles reporting on health systems interventions was observational with 13 (41%) articles (Figure 12.2). Among the 13 observational studies, eight reported on descriptive evaluations (largely of surveillance activities or systems), two on cohort studies, one on an interrupted time series analysis, one on a longitudinal data analysis and one on a cross-sectional population-based evaluation. Of the remaining articles, ten (31%) were mixed-methods, five (16%) were quasi-experimental, two (6%) were RCTs (RCTs) and two (6%) were economic evaluations.

Given the nature of health systems interventions, sample size units varied across included articles, with samples consisting of individual health workers (n=11); individual patients, households or consultations (n=12); and/or health facilities (n=6). An additional eight articles reported on interventions at population or system level, with less standardised quantification of sample sizes. Among those in which sample sizes for individual participants (e.g. patients, consultations, households, health workers) were reported, five articles had sample sizes greater than 1,000, but the largest number of articles (n=10) had sample sizes less than 100.

Figure 12.2 Health systems research by type of study design

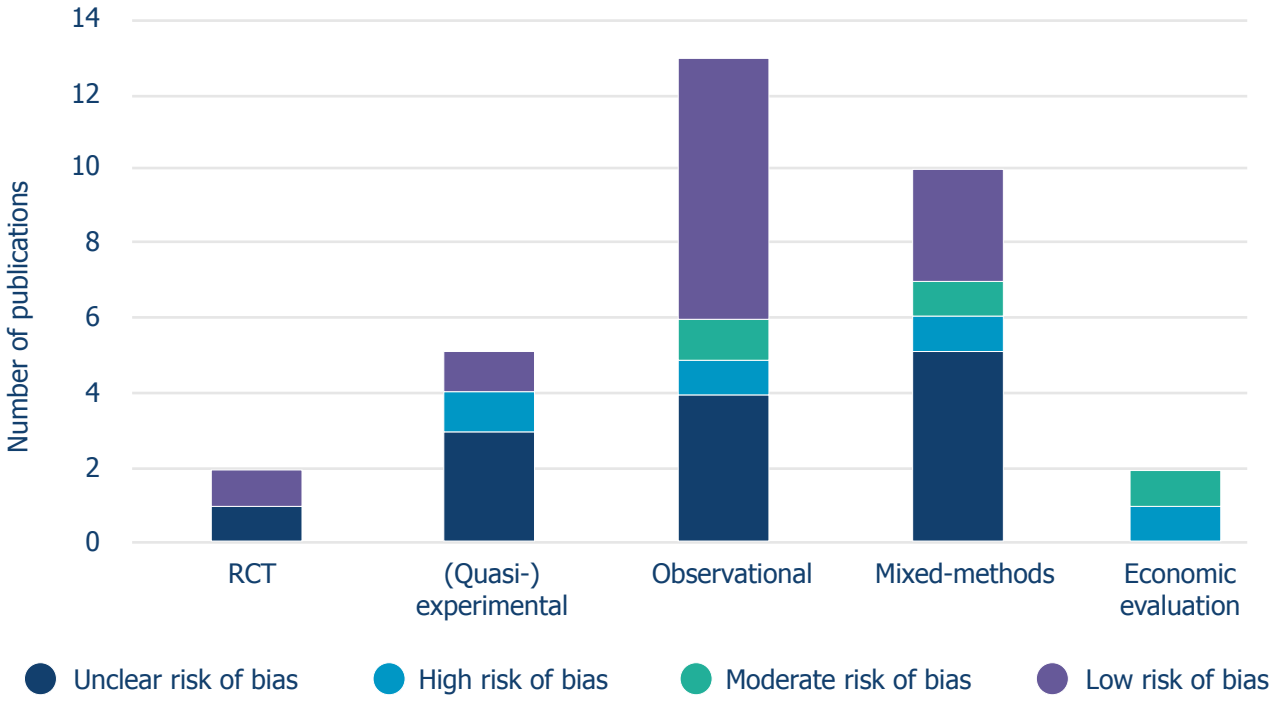


Quality appraisal

Of the articles reporting on health systems interventions, 19 (59%) included sufficient information to make a judgement on the risk of bias. Approximately one-third of health systems articles (n=12, 38%) were judged to have a low risk of bias for their study design, three (9%) a moderate risk and four (13%) a high risk. The remaining 13 (41%) articles were determined to have an unclear risk of bias based on the information available in the article.

Risk of bias by study design is presented in Figure 12.3. Of the five articles that employed a quasi-experimental design, three were determined to have an unclear risk of bias, one a high risk and one a low risk. More than half of the articles reporting on observational studies were judged to have a low risk of bias (n=7) and four an unclear risk. Of the two articles reporting on RCTs, one had a low risk of bias and the other an unclear risk; whereas for the two economic evaluations, one was judged to have high a risk and the other a moderate risk.

Figure 12.3 Risk of bias in health systems publications, by study design



Research location, setting and population type

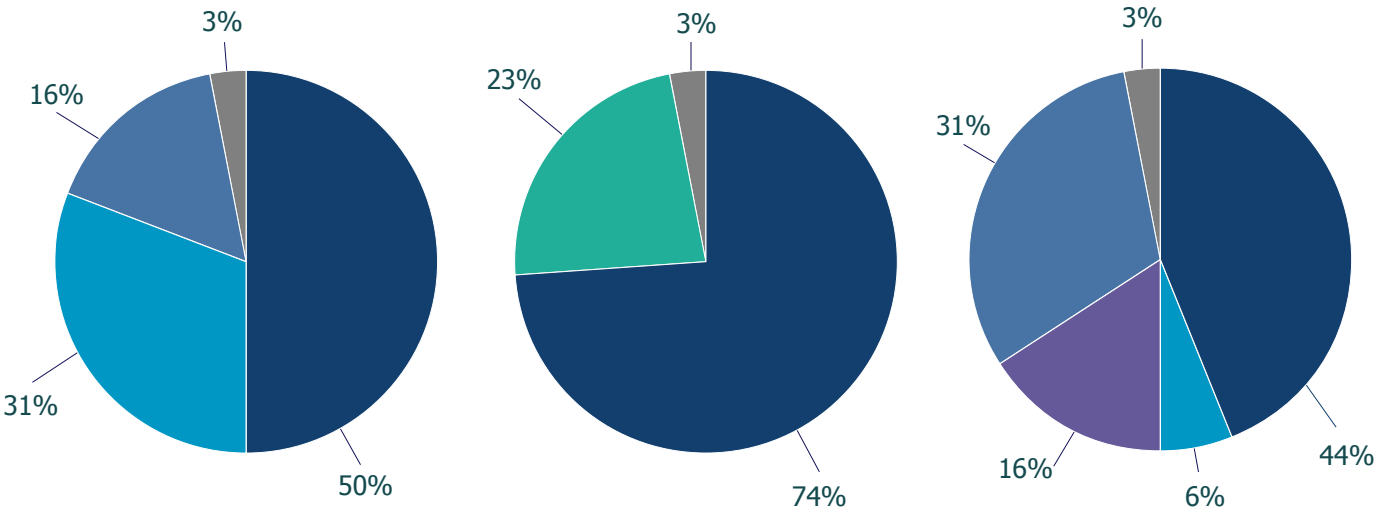
The location, setting and population type of study for health systems research in humanitarian contexts is summarised in Figure 12.4; a map of countries in which health systems research was conducted is provided in Annex 4. Half of the health systems articles reported on interventions in Africa, with 16 (50%) articles, followed by Asia (n=10, 31%) and the Middle East (n=5, 16%). Only one article reported on interventions in multiple regions (DRC, Somalia and Yemen).

The largest proportion of articles (n=23, 72%) reported on interventions in areas affected by armed conflict. This compares to only seven (22%) articles that reported on interventions in disease outbreaks. None of the health systems articles reported on interventions in environmental disasters, though one (3%) article reported on an intervention in Kakuma refugee camp, which hosts refugees who have fled multiple crises, including armed conflict, food insecurity and drought.

Health systems articles most commonly reported on interventions implemented in both urban and rural areas (n=10, 31%) or only in rural areas (n=10, 31%). Study interventions were implemented only in urban areas in six (19%) articles. Urban vs rural setting was not specified in six (19%) articles. Two-thirds of the articles included (n=21; 66%) reported on interventions implemented in non-camp settings, while only four (13%) reported on interventions in camp settings, and six (19%) in both camp and non-camp settings.

Interventions for emergency-affected (nondisplaced) populations were most common (n=14, 44%), though ten (31%) other articles reported on interventions for multiple population types. Interventions for refugee populations (n=5, 16%), host communities (n=2, 6%) and for unspecified population(s) (n=1, 3%) were less common.

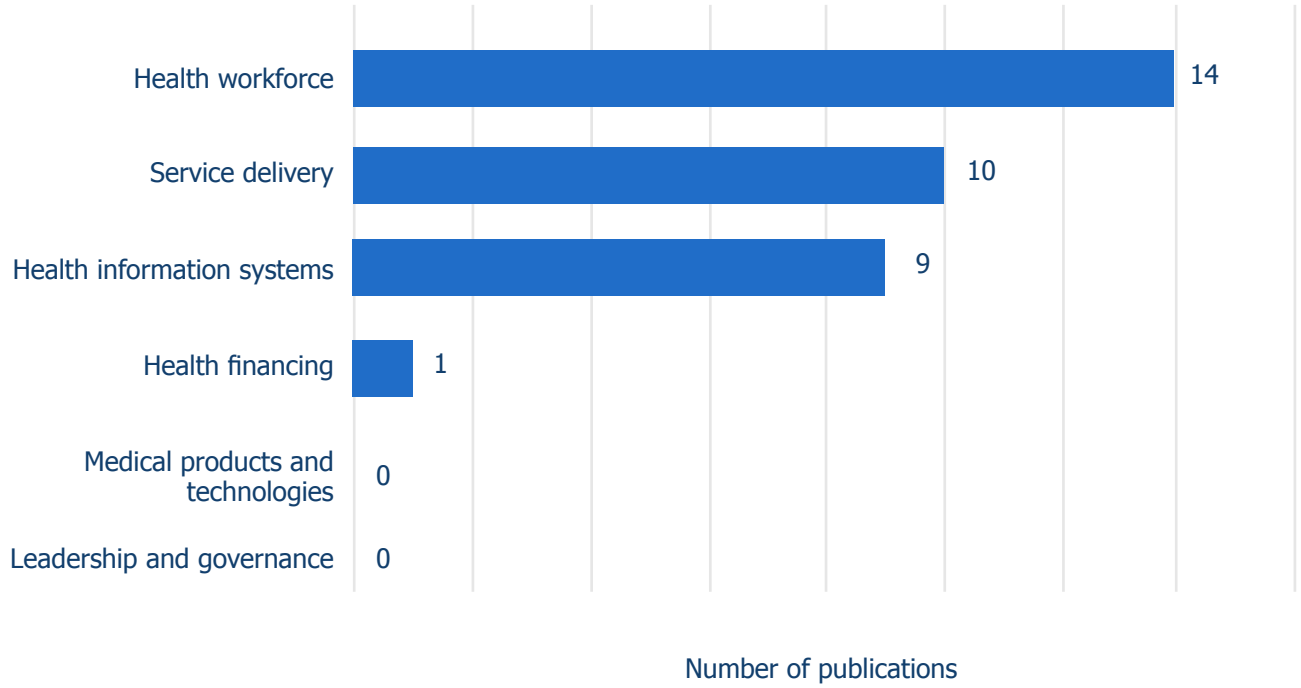
Figure 12.4 Distribution of health systems publications by region, crisis and population



Topical areas and interventions of focus: health system building blocks

To allow meaningful comparison of health systems articles between HHER1 and HHER2, included articles were categorised according to the health system building blocks (Figure 12.5), as was done in HHER1.[335] Articles that reported on health systems interventions in HHER2 encompass many but not all of the health system building blocks. Articles that report on health workforce interventions comprise 14 (44%) of the health systems articles.[151,160,162,174,219,306,323,336–338] Nearly as many articles (n=11, 34%) focused on service delivery[31,96,152,154,156,158,173,303,306,325,326] and on health information systems (HIS) interventions (n=9, 28%),[27,29–31,63,75,84,85,339] while only one (3%) reported on health financing.[340] No articles focused explicitly on the medical products, vaccines and technologies or leadership and governance building blocks.

Figure 12.5 Health systems research by health system building block



Fourteen (44%) of the 32 health systems articles were also included in the Health Service Delivery review because they evaluated the effectiveness of system-level interventions to improve service delivery (including health workforce) or evaluated the effectiveness of service-delivery approaches at scale.

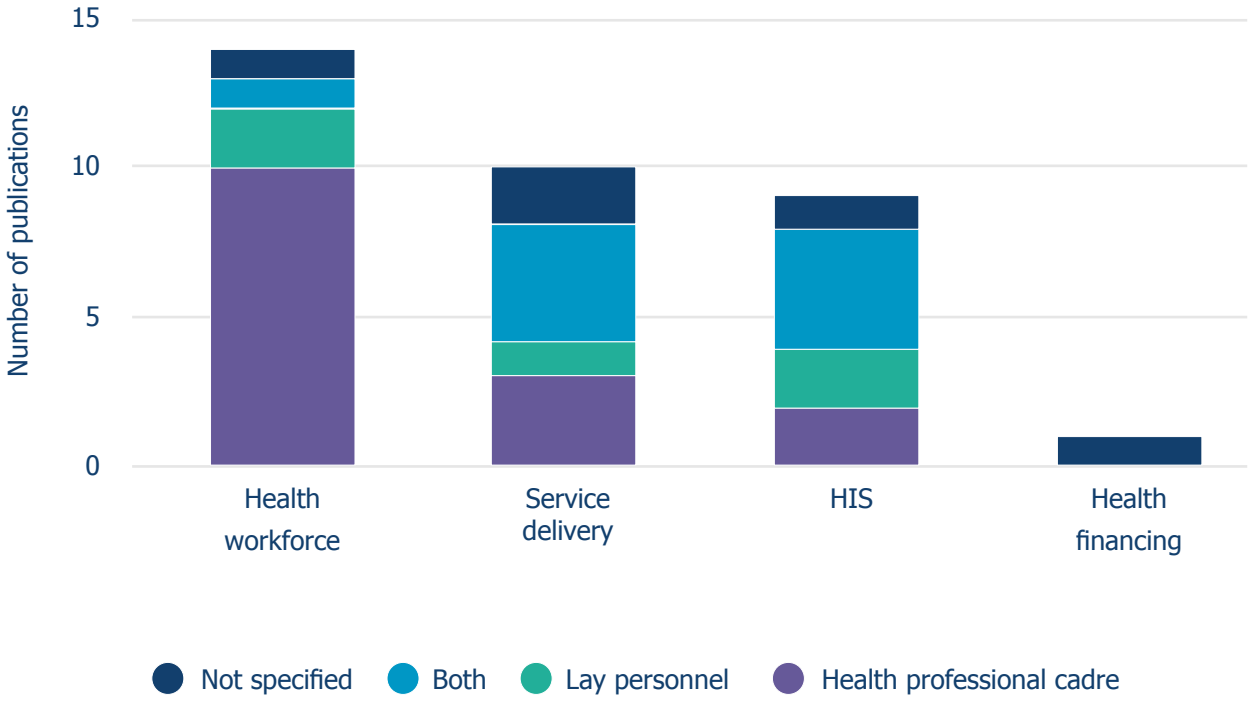
Study settings and participant populations varied by topic area, with several noteworthy trends. While articles focused on health workforce interventions were relatively evenly distributed in Africa, Asia and the Middle East, those focused on HIS (seven of nine articles) and service-delivery interventions (five of the ten articles) were largely concentrated in Africa. Health workforce and service-delivery articles were largely concentrated in conflict contexts (12 of the 14 workforce articles and all ten service-delivery articles), as was the single health financing article; however, the nine HIS intervention articles were more evenly distributed in outbreak (n=4) and conflict (n=5) settings.

Nearly half of health workforce (n=6) and service delivery (n=5) articles reported on interventions in rural contexts, with an additional four and three articles, respectively, reporting on interventions in contexts that were both urban and rural. All ten articles reporting on service-delivery interventions were implemented in non-camp settings, compared to six (43%) health workforce articles and six (67%) HIS articles. Of the remaining articles, health provider training interventions were implemented in both camp and non-camp settings in five health workforce articles and one additional HIS article on an early warning, alert and response system to detect infectious disease outbreaks, as well as the only health financing article. Interventions were implemented with emergency-affected (non-displaced) populations in two-thirds (n=6) of the HIS articles and the single health financing article, compared to five (46%) service-delivery and only three (21%) health workforce articles.

Study designs differed most markedly among articles reporting on HIS interventions, of which seven (78%) utilised observational designs and two (22%) employed mixed-methods designs. Similar study designs were adopted for health workforce interventions, of which five (38%) articles reported on observational studies and five others on mixed-methods; of the remaining two health workforce articles, two reported on quasi-experimental studies and two on RCTs. Service delivery interventions were evaluated using a relatively even distribution of mixed-methods (n=4), quasi-experimental (n=3), economic evaluation (n=2) and observational (n=1) designs. The one article examining a health financing intervention employed a quasi-experimental design.

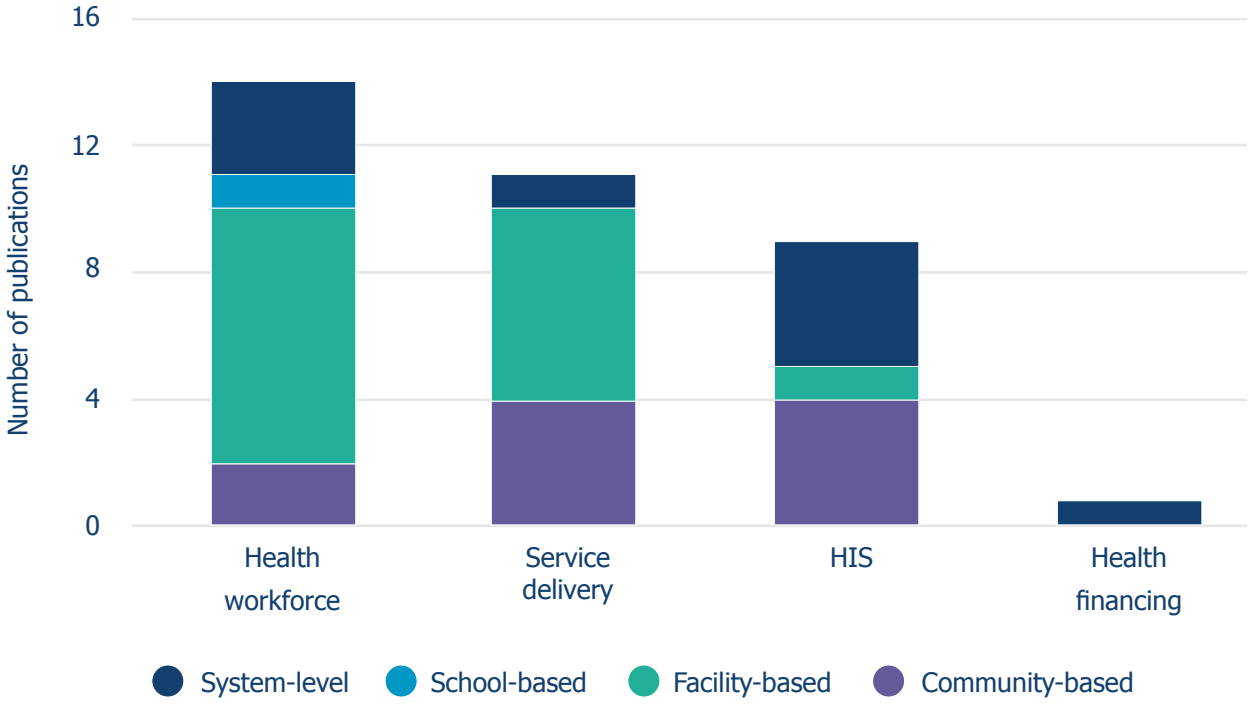
The types of personnel involved in health systems article interventions are presented by health system building block classification in Figure 12.6. The most common type of personnel was health professionals, both alone and in combination with lay personnel. More than two-thirds of health systems articles (n=23; 72%) reported on interventions involving any type of health professional cadre, including 15 articles that involved only health professionals and eight that involved both health professionals and lay personnel. An additional four (13%) articles reported interventions that involved only lay personnel. The remaining five (16%) articles did not specify the type(s) of personnel involved in the studied interventions. Health professional cadres involved in interventions included physicians (n=6), nurses (n=6), midwives (n=3), unspecified cadres of skilled birth attendants (n=2), mental health clinicians (n=4), medical students (n=1) and unspecified health professionals (n=10); interventions often involved a combination of personnel types. Lay personnel involved in interventions included community health workers (n=4), web-based tutors (n=1), call centre operators (n=1) and locally trained volunteers (n=1), among others.

Figure 12.6 Personnel involved in health systems interventions, by health system building block



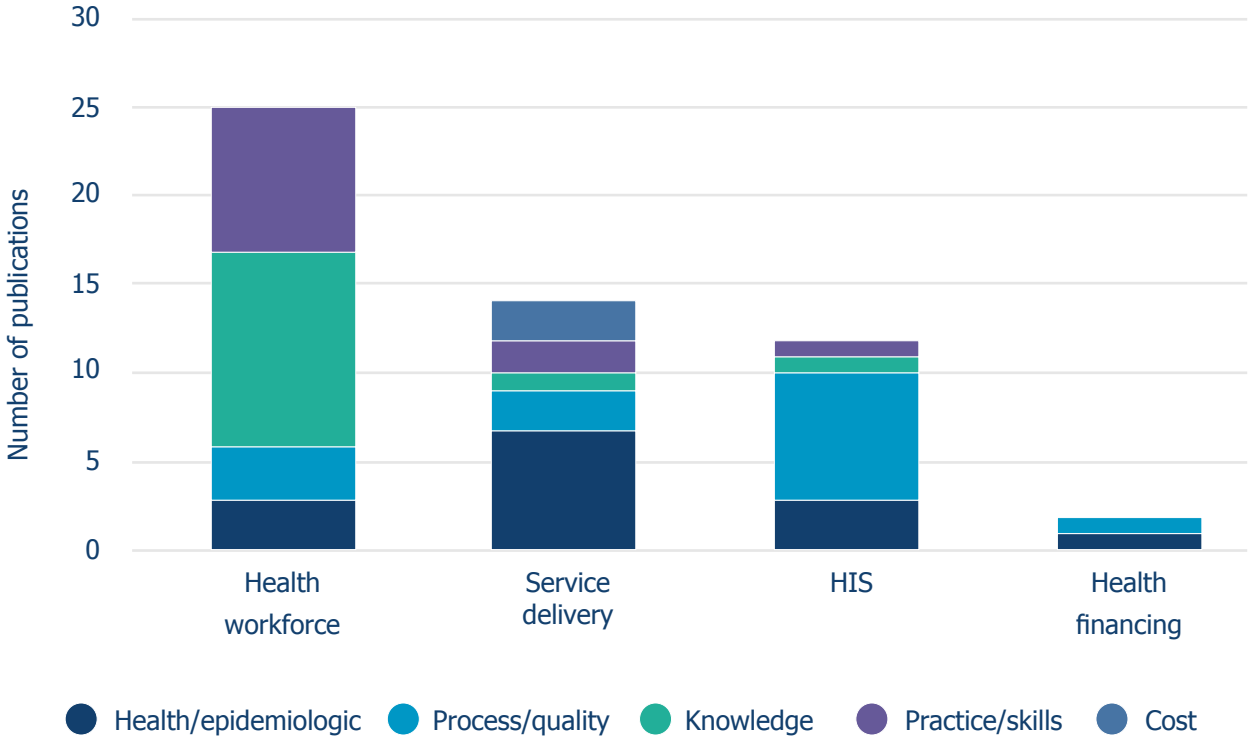
Distributions of implementation sites reported in health systems articles are presented in Figure 12.7 disaggregated by health system building block categories. The largest proportion of health systems articles (n=14, 44%) reported on facility-based interventions (excluding pharmacies). Smaller numbers of articles reported on community-based (n=10, 31%) and system-level (n=8, 25%) interventions, and one health workforce-focused article reported on a university-based intervention.

Figure 12.7 Heath systems intervention implementation sites, by health system building block



Outcome measures for health systems interventions varied substantially across articles but can be broadly categorised as follows: (1) knowledge; (2) practices or skills demonstration; (3) process or quality measures; (4) health or epidemiologic outcomes; and (5) cost (Figure 12.8).

Figure 12.8 Heath systems intervention research outcomes, by health system building block



*Categories are not mutually exclusive; articles may report on interventions with multiple types of outcome measures.

Health or epidemiologic outcomes were measured in the largest number of health systems articles (n=13, 41%) and included service utilisation[152,158] and provision,[157,303] symptom and physiological measures,[228] maternal and neonatal outcomes (e.g. rate of umbilical cord ligation, birth weight, gestational age),[160,173] anthropometric outcomes (e.g. HAZ),[96] incidence rates[31,63] and mortality.[27,325] Process- and/or quality-related indicators were also commonly measured and were reported in 12 (38%) health systems articles. Process/quality measures included indicators such as reporting timeliness and/or response,[27,63,75,84,85,339] satisfaction,[162,306] and system attributes (e.g. timeliness, simplicity, flexibility, acceptability, representativeness and stability),[75,85,339] among others. Knowledge was also measured in 12 (38%) health systems articles;[29,151,160,162,174,219,306,323,336–338] practices or skills were assessed in a total of ten (31%) articles,[31,151,162,174,242,266,306,323,336] seven of which evaluated both knowledge and practice/skills.[151,162,174,266,306,323,336] Outcome measures focused on costs in only two health systems articles: one in which the operating budget for surgical services was evaluated as a proportion of total operating budget for a complementary package of activities in a district hospital in the DRC;[326] and the other assessing cost-effectiveness of caesarean sections, also in the DRC.[154]

The relatively small number of articles within each health system building block and for health systems overall, coupled with the diversity of specific interventions and outcome measures, hinders meaningful comparison of effectiveness across studies. Interventions and outcomes for each health system building block topic area are as follows.

Health workforce

A total of 14 articles reported on health workforce interventions.[151,158,160,162,174,219,228,242,266,306,323,336–338] Of these articles, 13 focused on healthcare training interventions; the remaining article evaluated a multicomponent health service delivery programme that included human resource development and training components.[306] Five of the ten articles on health workforce interventions focused on SRH, including training and support interventions for essential newborn care,[151] safe abortion and post-abortion care,[174] nuchal cord management during delivery,[160] and general training for skilled birth attendants and community health workers.[158,162] Four articles focused on MHPSS, examining psychological first aid training,[219,266] mhGAP training and supervision,[242] and stress management relaxation response resilience training.[228] One article concentrated on NCDs,[306] specifically a multicomponent intervention to advance the level of care and management of hypertension and diabetes at primary healthcare centres. The remaining four health workforce intervention articles focused more broadly on general health or primary care training.[323,336–338]

Most health workforce articles (n=8) reported on facility-based interventions. Of the remaining articles, three reported on system-level interventions, two on community-based interventions and one on a school-/university-based intervention. All eight facility-based interventions incorporated training for healthcare providers. The two articles implementing community-based interventions focused on web-based basic medical training for refugees[337] and psychological first aid training for mental health nurses.[266]

Health workforce interventions were studied using varied methodologies, most commonly observational (n=5) and mixed-methods (n=5) studies, with two articles reporting on RCTs and two on quasi-experimental studies. Eleven of the 14 health workforce articles measured outcomes related to knowledge. Seven of these articles also measured outcomes related to practices or skills such as change in participant counselling skills, accurate completion of partograph, skills in newborn resuscitation with bag and mask and provision of appropriate counselling, among others.[151,162,174,266,306,323,336] Fewer health workforce articles reported measures related to process or quality (n=3)[162,242,306] or direct health or epidemiologic outcomes (n=3).[158,160,228] The two articles including process or quality measures in addition to knowledge and practices/skills included: (1) a mixed-methods assessment of a competency-based skilled birth attendant training, which qualitatively evaluated the curriculum and programme quality, in addition to reporting process indicators for the training;[162] and (2) a mixed-methods study of a multicomponent intervention for hypertension and diabetes care that measured provider knowledge and skills, as well as patient satisfaction.[306] The only article that reported a direct health or epidemiologic outcome in addition to knowledge outcomes studied nuchal cord management during delivery using a mixed-methods design incorporating a retrospective cohort study of birth data, knowledge survey and semi-structured interviews with skilled birth attendants, measuring numerous maternal and neonatal outcomes (e.g. birthweight, gestational age, Apgar scores, newborn resuscitation, postpartum haemorrhage, episiotomy), in addition to rates of umbilical cord ligation and skilled birth attendant knowledge.[160]

Health service delivery

A total of ten articles focused on delivery of health services,[96,152,154,156,158,173,303,306,325,326] with two articles also incorporating health workforce.[158,306] Most service-delivery articles reported on interventions to advance quality of care including a multicomponent intervention to advance the level of care and management of hypertension and diabetes at primary healthcare centres;[306] integration of an NCD management programme within emergency primary care;[303] an approach to systematically measure quality of care;[325] and an intervention incorporating satellite/mobile clinics, referral services, ambulance services and community health service workers.[152] These articles also focused on various components of SRH including provision of emergency obstetric care;[154] a standardised training and a supportive supervision package aimed at improving existing community health worker capacity to provide maternal and neonatal home visits and BCC messages;[158] maternal and child health mobile health teams, providing primary care services to pregnant and postpartum women and children under five;[156] and a comprehensive approach to post-abortion care, including community mobilisation, provider counselling, treatment of abortion complications, provision of voluntary contraceptive services and referrals as needed.[173]

One article evaluated a number of social and economic development health and WASH projects, including (of most relevance for health systems infrastructure interventions) rehabilitation and construction of health posts, reporting only HAZ as the primary outcome measure.[96] The remaining health service delivery article assessed operating budget and utilisation of surgical services for district hospitals through economic evaluation.[326] Of the ten service-delivery articles, one was both community- and facility-based, three were facility-based, four were community-based and one was system-level. Almost half (n=4, 40%) of these articles' interventions were implemented with both lay personnel and health professionals.

Study designs varied in the ten articles reporting on health service delivery interventions and included mixed-methods (n=4), quasi-experimental studies (n=3), economic evaluations (n=2) and observational studies (n=1). Outcomes reported for health service delivery interventions differed across articles. Direct health or epidemiologic outcomes were reported in seven (70%) articles [96,152,156,158,173,303,325] and included service utilisation and provision, contraceptive method choices, treatment adherence, HAZ, mortality rates and case counts. Outcomes related to practices or skills were reported for two articles[96,325] including indicators such as structural and process quality, as well as health provider practices and skills. Cost outcomes were reported in the article examining district hospital surgical services[326] and an economic evaluation of provision of emergency obstetric care in the DRC.[154] Knowledge outcomes were reported only in the article that studied a multicomponent intervention for hypertension and diabetes care.[306]

Health information systems

A total of nine articles reported on HIS interventions,[27,29–31,63,75,84,85,339] one of which also incorporated service-delivery intervention.[31] All nine HIS intervention articles focused on disease surveillance, though one of these interventions was a community-based strategy to interrupt Ebola transmission that included, and primarily centred on, response activities to control transmission.[31] Surveillance interventions focused specifically on Ebola in four of the nine HIS articles[27,29–31] and one article focused exclusively on poliovirus surveillance.[63] The remaining four articles examined surveillance

for multiple diseases including cholera, acute jaundice syndrome, acute flaccid paralysis, dengue, diphtheria, measles and meningitis, among others.[75,84,85,339]

HIS articles mostly reported on system-level (n=4) or community-based (n=4) surveillance, with only one implementing health facility-based surveillance through active case finding for Ebola. System-level interventions included two national call centres for the detection of Ebola cases,[27,30] one surveillance system for diarrhoeal diseases,[75] and one early warning, alert and response system for communicable diseases (e.g. measles, diphtheria).[339] Community-based interventions included two community-based surveillance systems to identify multiple outbreak-prone diseases, [84,85] a village polio volunteers programme for poliovirus surveillance[63] and a community-based strategy to interrupt Ebola transmission.[31] The one article reporting on a facility-based intervention examined facility-based active case finding for Ebola.[29]

Half of the HIS articles that specified the type of personnel involved in interventions included both health professionals and lay personnel in surveillance implementation, compared to two articles that involved only health professionals and two that involved only lay personnel. Health professionals included doctors and nurses; lay personnel included call centre operators and dispatch teams, locally trained volunteers and community health workers.

Most of the HIS articles reported on observational studies (n=7). Two additional articles employed mixed-methods study designs, one of which included quantitative analysis of health registers, surveillance reports and key informant interviews;[75] while the other consisted of facility-based interviews, record/document reviews and key informant interviews.[339] Outcomes reported for HIS intervention articles were most often related to process or quality indicators (n=7).[27,30,63,75,84,85,339] These indicators included system attributes (e.g. timeliness, simplicity, flexibility, acceptability, representativeness and stability),[75,85,339] responsiveness (e.g. proportion of alerts with successful follow-up within a day, unmet calls and false alerts),[27] call centre sensitivity[30,75,339] and timeliness of reporting.[63,75,84]
Three HIS articles measured direct health or epidemiologic outcomes including case counts and mortality, all of which also reported other categories of outcomes.[27,31,63] Outcomes related to practices/skills were reported in only one HIS article, in which the number of unsafe burials was reported for a community-based strategy to interrupt Ebola transmission.[31] Similarly, knowledge-related outcomes were also reported in only one HIS article that measured awareness of Ebola in its assessment of health facility-based active case finding.[29]

Health financing

Only one article focused on health financing.[340] This was a quasi-experimental study of a collaboration with donor and NGOs to establish a basic package of health services in Afghanistan. Primary outcomes included observed facility structural quality; patients' and households' perceived quality of care; and utilisation of health services comparing three study arms: (1) user fee arm, with a flat fee for services and percentage charge of wholesale drug price; (2) free services arm; and (3) community health fund arm, where households pre-paid a set amount for health facility access.

Cumulative summary of recent health systems publications

Together, HHER1[2] and HHER2 identified 88 articles published between 1980 and April 2021 that report on health systems research in humanitarian crises. Comparison of articles included in HHER1 and HHER2 suggests an increase in both volume and diversity of findings in recent years.

Changes in research between the review periods

Key differences in the studies included in both evidence reviews are presented in Figure 12.9. HHER1 found 56 health systems articles published across 32 years, while HHER2 found approximately half as many articles in one-third of that time.

Nearly all articles in HHER1 were case studies and no articles had experimental or quasi-experimental study designs. HHER2 saw a methodological shift, with experimental and quasi-experimental study designs represented (n=7, 22%). It is important to note that HHER1 included articles in which no explicit intervention was being evaluated (e.g. articles focused on the impact of a crisis on health systems), as well as study designs with limited attribution abilities (e.g. literature reviews, case studies), whereas inclusion criteria for HHER2 was limited to articles evaluating the effectiveness of an intervention, with the exclusion of many of the study designs included in HHER1. These methodological differences between the two reviews make direct comparison of changes challenging and may explain some of the shifts between the reviews.

Study settings and populations did not substantially change between HHER1 and HHER2. While most articles in HHER1 reported on interventions in Africa and Asia, interventions in Europe and South America were also represented. In HHER2, the majority of articles similarly reported on interventions in Africa and Asia, with five also reporting on the Middle East; however, there were no interventions in Europe or South America/Latin America/the Caribbean.
The vast majority of articles in HHER1 focused on interventions in areas affected by armed conflict and this remained true in HHER2. Similarly, interventions focused on general populations were the most common type in HHER1, as well as in HHER2 when accounting for articles focused on multiple population types.

The majority of articles in HHER1 assessed interventions focused on policy areas of leadership and governance, but there were no articles focused on this building block in HHER2. Health workforce interventions were most represented in HHER2, showing a proportionally substantial increase in attention to this area in recent years.

Figure 12.9 Comparison of health systems research across evidence reviews

Study design and quality	HHER1 (1980–2013) 56 articles	HHER2 (2013–2021) 32 articles
Study design		
Experimental	-	2
Quasi-experimental	-	5

Observational	**56**	**13**
Mixed-methods	-	10
Economic evaluation	-	2
Study quality		
Low risk of bias	Comparable quality assessment not completed in HHER1.	12
Moderate risk of bias		3
High risk of bias		4
Unclear risk of bias		**13**
Study characteristics		
Region		
Africa	19	**16**
Asia	**24**	10
South America	8	-
Middle East	-	5
Europe	13	-
Multiple	-	1
Crisis type		
Armed conflict*	**37**	**23**
Environmental disaster	18	-
Outbreak	-	7
Multiple	-	2
Population type		
Refugee	3	5
Internally displaced	1	-
General population	**48**	**14**
Host community	-	2
Multiple	2	10

Not specified	-	1
Other	2	-
Study topics and interventions		
Health system building blocks		
Leadership and governance	**13**	-
Service delivery	-	10
Health financing	1	1
Health workforce	7	**14**
Medical products, vaccines and technologies	1	-
HIS	1	9

* Including one "political crisis"

Health systems evidence gaps

HHER1 commented on several gaps in the evidence base, noting the need for research into some of the specific areas of the health system, in particular the influence of health financing and access to medicines. These remain insufficiently researched, given that only one paper was identified in HHER2 with a health financing intervention and no articles explicitly focused on interventions related to access to medicines. HHER1 also highlighted a need for evidence on the impact of preparedness efforts in relation to improved health outcomes following humanitarian crises; however, as the scope of HHER2 excluded evidence of preparedness interventions, it is unclear to what extent this gap remains. Finally, integration of health services was among the key evidence gaps identified in HHER1, specifically relating to different models of delivering health interventions along three categorical lines: vertical vs integrated service delivery; facility- vs community-based interventions; and comprehensive packages vs single interventions. Throughout HHER2, evidence in each topic area has demonstrated a wide range of interventions, both facility- and community-based; however, only one study[156] explicitly evaluated both community- and facility-based approaches to addressing the same outcome measures, suggesting this remains an area where greater evidence is needed. Additionally, though HHER2 included evidence from one study involving comprehensive packages – the economic evaluation of district hospital surgical services as part of a complementary package of activities in the DRC by Sion et al. (2015)[326] – this was not studied in comparison to stand-alone interventions and evaluation was limited to only one component of the package.

Though little has been published systematically reviewing or examining the status of health systems evidence in humanitarian crises since HHER1, a research agenda-setting exercise was conducted in 2014 and 2015 highlighting priority needs in health systems research in fragile and conflict-affected states.[341]

Centred on five themes (transition and sustainability, resilience and fragility, equity and gender, accessibility and capacity strengthening), the exercise identified many research needs, including several of relevance to this review, such as the relationship between more inclusive health service delivery and reduction of tension; conflict-related factors in healthcare access; referral systems and emergency care access; and health system capacity strengthening, particularly of the health workforce and leadership. While many articles included in HHER2 contributed to the evidence base on capacity strengthening and health workforce development, the research needs identified in the 2016 exercise, along with several other gaps related to equity and gender perspectives, remain insufficiently addressed in the body of evidence in this review. The absence of studies on governance and leadership, including management, is a particularly critical gap as it encompasses several priority issues in humanitarian health response such as accountability, transparency and participation.

HHER2 studies' links to health system building blocks were made for inclusion in this topic area; however, few of these studies were directly framed as health systems interventions or components of broader health systems interventions. Systems-thinking approaches and methodologies were not widely used, suggesting an important gap in methodologies that apply broader, holistic perspectives to study intervention effectiveness in humanitarian settings. Similarly, there seems to be little health systems research framed around the humanitarian-development nexus. Although many HHER2 articles highlighted context-based challenges in humanitarian crises, peer-reviewed examples of broader health systems interventions in humanitarian crises – specifically the roles of governments, humanitarian agencies and development partners, as well as impact pathways in a range of contexts – are lacking.

Recommendations for future health systems research

Based on the synthesis of recent peer-reviewed publications, gaps in the evidence base for health systems research in humanitarian contexts that should be prioritised for future research include the following:

- Given the limited volume of research, there is a need to expand research on strategies and interventions addressing health financing and access to medicines/medical products, vaccines and technologies, as well as governance and leadership/management.

- There is a need for more systematic reporting on the roles that governments, humanitarian agencies and development partners play in strengthening health systems in humanitarian crises, as well as on both the immediate and longer-term impacts of health systems interventions and application of quality improvement science to systematically examine how this might change the provision of services.

- Study designs and methodologies that employ systems-thinking approaches to contextualise interventions, document impact pathways and examine drivers of intervention effectiveness are needed to understand the complexities of health systems in humanitarian settings.

13

Summary of Findings and Recommendations For Future Research

13. SUMMARY OF FINDINGS AND RECOMMENDATIONS FOR FUTURE RESEARCH

Topic area evidence summaries and recommendations

There was a notable increase in the publication of studies evaluating effectiveness of humanitarian health interventions between HHER1 and HHER2. The most common topic area of focus shifted from communicable disease control, which accounted for 30% of studies in HHER1, to MHPSS, which accounted for 38% of the studies in HHER2. Topic areas with the most limited evidence base included NCDs and WASH, though it should be noted that the focus of the review was on health and most WASH research did not directly link the two sectors. Within all topic areas, there was an increase in the diversity of interventions studied, which is likely a reflection of the broadening of the scope of humanitarian interventions in the past decade and the increase in peer-reviewed publication of research on humanitarian programming.

Communicable disease control

A total of 70 articles on communicable disease control interventions were reviewed. Ebola and cholera accounted for the majority of publications and there was a near or complete absence of evidence for other significant diseases such as respiratory infections, diarrhoea and malaria. Vaccination campaigns were the most frequent intervention of focus, followed by surveillance and contact tracing; few publications addressed communicable disease treatment, testing and other prevention measures. Future research should prioritise diseases with a high morbidity and mortality burden or where there is failure to achieve disease control despite existing evidence. Studies to increase access to and use of diagnostic testing and treatment interventions that have been demonstrated to be effective in other contexts, but for which there is a lack of evidence in humanitarian settings, are also needed.

Water, sanitation and hygiene

Twenty-one articles on WASH interventions were reviewed, with most articles reporting on water and hygiene interventions. A particular challenge with the WASH review was identification of publications that reported specifically on health and nutrition outcomes, where most of the evidence in the sector did not have any direct linkages to health outcomes. To increase relevance to health and cross-sectoral linkages, future WASH research should endeavour to include health and/or nutrition outcomes, along with an economic evaluation component.

Nutrition

Thirty-four articles on nutrition interventions were reviewed: most focused on wasting, with far fewer articles on other nutrition topics. Supplementary feeding and cash transfers were the most common interventions of study. Persistent evidence gaps that should be prioritised for future research include interventions to improve breastfeeding, breast milk substitutes, re-lactation, complementary feeding strategies, nutrition education, bundled and multi-sectoral interventions and targeting (specifically of older people and people with disabilities).

Sexual and reproductive health

Thirty-two articles on SRH interventions were included in the review; over half reported on MNH interventions and over a quarter on GBV interventions. Recommendations for future research include expanding research on service delivery strategies for multi-faceted packages of care; more consistent assessment of SRH service quality and use of common frameworks and evaluation metrics; and diversification of humanitarian contexts and subpopulations of focus.

Mental health and psychosocial support

One hundred and four articles on MHPSS interventions met inclusion criteria, making it the area with the largest evidence base. Focused, non-specialised service interventions and psychological interventions were the most common intervention type; the majority of studies included measurement of non-disorder-related psychosocial and psychological constructs, as well as non-specific psychological distress and wellbeing outcomes. Recommendations for future research include continued support for replication studies to better understand effectiveness of interventions and delivery modalities across diverse humanitarian settings and for varied subpopulations, in addition to alignment with recently published research priorities and implementation guidance.

Non-communicable diseases

Fifteen articles on NCD interventions met inclusion criteria. Diabetes and hypertension were the most frequent conditions of focus; other NCDs such as cancer, respiratory disease and CVD were minimally included. Primary care provision was the most common intervention type. The Middle East was the predominant region of origin, with most research focusing on conflict-affected populations. Recommendations for future research include diversifying the focus of NCD research to include Africa and Asia, as well as other types of crises such as environmental disasters. Access to care and intervention effectiveness for the most prevalent NCDs at primary care level and use of longer-term follow-up periods and health outcome measures would also be beneficial in future research.

Injury and rehabilitation

Six articles on injury and rehabilitation interventions met inclusion criteria and were reviewed. One article reported results from an RCT, but none reported on quasi-experimental studies or economic evaluations. Trauma care interventions accounted for half of the articles, with one article assessing post-trauma care and two focused on rehabilitation. HHER2 saw a noticeable decrease in the volume of research conducted on injury and rehabilitation. Both reviews primarily found studies occurring in settings affected by armed conflict; and while most articles in HHER1 focused on orthopaedic care, HHER2 identified a more diverse range of topics. The low number of publications identified in the review suggests there is a need to expand research on injury and rehabilitation in humanitarian crises generally; research on injury rehabilitation programmes is an important gap in the recent literature, as are studies conducted in Africa. Incorporation of longer-term outcome measures and costing would contribute to addressing persistent evidence gaps.

Health service delivery

Fifty-six articles on health service delivery interventions met inclusion criteria and were reviewed. Community-based and primary care interventions were the two most commonly included levels of care; MHPSS was the most common intervention type, followed by SRH. Over half of the articles evaluated the effectiveness of service-delivery models, with a third evaluating specific protocols, procedures or clinical decision support tools. In future research, more multi-site, larger-scale and longer-term research on effective models of care in different contexts and subpopulations should be prioritised, along with more systematic reporting on interventions to strengthen health service delivery and packages of care. Comparisons of intervention effectiveness across settings and studies on the effectiveness and costs of both focused and integrated models of community- and facility-based care are also needed.

Health systems

Thirty-two articles on health systems interventions were reviewed; nearly half reported on health workforce interventions, with areas of focus also including service delivery and HIS interventions. More systematic reporting on the roles that governments, humanitarian agencies and development partners play in strengthening health systems in humanitarian crises, as well as immediate and longer-term impacts of health systems interventions, will strengthen the health systems evidence base. Expanding research and interventions strategies that address health financing; access to medicines/medical products, vaccines and technologies; and leadership and management will also help to address gaps in the current evidence base.

Conclusions and recommendations

One overarching theme was the challenge of implementing high-quality and well-reported humanitarian health research. Humanitarian contexts inherently present significant challenges to research design (particularly in relation to experimental designs) and implementation; however, in many cases, where research has been conducted simple improvements in reporting and intervention description could make research more impactful in terms of both the utility of findings and inclusion of information necessary for replication of successful interventions. Also of critical importance for future research is prioritising investment in research where study designs can characterise changes resulting from a particular intervention. Although a substantial portion of studies documented changes in health service coverage and/or outcomes, in many cases change could not be definitively attributed to the intervention because of the study design used (e.g. no comparison group), making it difficult to apply research findings to inform decision making in relation to the choice of the most effective interventions in a given setting. Another important limitation of the current evidence base relates to challenges with aggregating findings across studies where different outcome measures and definitions are often used and the longer-term impact of interventions is seldom measured. Future research should endeavour to use standard indicators and consider the feasibility of measuring longer-term outcomes to enable better comparison of the effectiveness of different interventions against one another, as well as intervention effectiveness across different contexts and populations.

Although the described shifts in the evidence base indicate efforts to address many of the gaps identified in HHER1, the variation in research across and within topics areas does not necessarily reflect the health issues of greatest concern or bottlenecks to quality health service delivery, access and utilisation in humanitarian settings. For example, research on communicable disease treatment interventions was notably limited (nine articles, 3% of all publications), though it could be argued that many interventions from LMICs readily apply to communicable diseases and other topic areas in humanitarian contexts. A particular challenge and limitation of HHER1 and HHER2 is the focus on research generated in humanitarian settings, which arguably reflects a small portion of the evidence that may be relevant. Similarly, despite the increasing burden of NCDs both globally and in humanitarian settings, the volume of evidence identified in this review (15 articles, 6% of publications) and the cumulative evidence across the first and second reviews (23 publications) pales in comparison to the scope of both current and future challenges associated with the adequate diagnosis and management of NCDs, particularly given challenges associated with continuity, quality and cost of care.

More broadly, the need for additional research on health service delivery, in particular task shifting, and other strategies for scaling up evidence-based interventions and supporting health system resilience are also established evidence gaps that have yet to be addressed. Similarly, economic evaluations continued to constitute only a small proportion of studies (13 articles, 5% of publications). This is a significant limitation to the current evidence base given the importance of cost, where humanitarian needs nearly always exceed available resources. Difficult decisions must be made in prioritising interventions based on competing and unfortunately often cost-related considerations. While many research priority setting efforts are topic- or sector-specific, there is a clear need to prioritise expansion of cross-cutting topics – namely, health service delivery, health systems and utilisation of cost-effectiveness methodologies – in humanitarian health research to effect evidence-informed change in humanitarian health policy and practice.

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Annexes

ANNEXES

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Final Search Strategy by Database

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Critical Appraisal Strategy and Tools

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