

Annex

Responding to Ebola epidemics:
An ALNAP Lessons Paper

ALNAP is a global network of NGOs,
UN agencies, members of the Red Cross/
Crescent Movement, donors, academics
and consultants dedicated to learning how
to improve response to humanitarian crises.

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Technical contributions

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Abbreviations and acronyms

ALNAP	Active Learning Network for Accountability and Performance in Humanitarian Action
CCC	community care centre
DRC	Democratic Republic of the Congo
ETC	Ebola treatment centre
ETU	Ebola treatment unit
HIV/AIDS	human immunodeficiency virus infection and acquired immune deficiency syndrome
ICRC	International Committee of the Red Cross
IDP	internally displaced people
MSF	Médecins Sans Frontières
NGO	non-governmental organisation
PPE	personal protective equipment
SARS	severe acute respiratory syndrome
SDB	safe and dignified burials
WASH	water, sanitation and hygiene
WHO	World Health Organization

1 Detailed methodology

1.1 Inception report

The ALNAP Lessons Paper that this annex accompanies is the result of a structured review of available literature, conducted in November 2019 and June 2020. The methodology used is aligned with that described in the [ALNAP Methods Note](#) (Dillon and Campbell, 2018). Key Aid Consulting prepared a detailed Inception Report in October 2019. In July 2020 the research team prepared a Methods Note to capture the adaptation of the methodology. ALNAP reviewed both the Inception Report and the Methods Note.

1.2 Inclusion criteria

Type of studies

To answer the research question, the consultants included both qualitative and quantitative research. Because of the overall scarcity of evidence in the humanitarian sector (Puri et al., 2014), the team opted for broader inclusion criteria than those traditionally recommended to undertake systematic review (Higgins and Green, 2011).

To be eligible for inclusion, qualitative studies had to:

- state that they were based on data collected from project stakeholders (affected communities, beneficiaries, implementing agencies, local authorities, etc.)
- describe clearly the inputs, activities, outputs, and outcomes of the humanitarian response to the Ebola epidemic.

To be eligible for inclusion, quantitative studies had to apply a research design that minimised bias in the attribution of identified effects to the applied intervention – for example experimental designs (e.g. randomised controlled trials), or quasi-experimental designs (e.g. propensity score matching). Mixed-method approaches were also eligible, and those presenting a critical risk of bias have been treated as non-random studies and still included.

The consultants included academic articles, literature reviews and grey literature such as evaluations or research papers (published and unpublished) produced by NGOs, international organisations, government agencies and think tanks. Guidance documents were only included if they specified that they had been developed based on documented lessons learnt.

Ineligible publication types included: personal blogs, commentaries, diaries, opinion pieces, workshop reports, marketing material such as 'life stories', newspaper articles, magazine articles and legal proceedings or court documents.

The team included studies from 2014 (the year of the Ebola Outbreak in West Africa) onwards.

Searches were conducted in English, but studies were not excluded on the basis of language. Documents were still considered if a French or English translation existed.

Type of populations and contexts

This lessons paper focuses on interventions that attempt to provide support to individuals and households in all locations the Ebola epidemic outbreaks have affected since 2014. Populations of interest were therefore those that had been directly or indirectly affected by any Ebola outbreak since 2014.

All crisis-affected population groups have been included irrespective of their age, gender, disability, health status, literacy, pregnancy status, parental status, specific status according to the Geneva Conventions (and their additional protocols), ethnic or religious belonging, and level of income. Location has not been used as an exclusion criterion.

Studies not reporting on a specific Ebola outbreak or range of outbreaks have been excluded.

Type of interventions

This lessons paper focuses on interventions that specifically aimed to improve the situation of Ebola-affected populations by: (1) stopping the transmission of the disease (including not only through vaccination, but also water management or hygiene promotion); (2) reducing morbidity and mortality (including early diagnosis and treatment); or (3) containing the impact of the epidemic on both the health system and on other areas of life (including livelihood and food security support).

If an intervention contained several components, including at least one of the aforementioned, the paper was considered to have met the eligibility requirements. Studies that covered epidemic preparedness exclusively have not been included for the sake of a homogenous final analysis.

The consultants included studies describing any type of activity, as long as it aimed to improve the situation of epidemic-affected populations. Literature about interventions designed by any actor (NGOs, UN agencies, Red Cross/Red Crescent Movement, private sector actors and government actors), and on surveillance, detection or response to the Ebola epidemic have all been included. Lastly, studies were included no matter their intervention length.

Type of outcomes

Documents identifying any type of outcome measures were included. The team did not place any specific restrictions on the way an outcome was measured, or on the duration of the outcome measurement. Therefore, no studies were excluded on the basis of unreliable measurement outcomes.

The team also included studies that measured processes, rather than outcomes.

1.3 Search method

To ensure a structured and comprehensive process, the search strategy included academic databases and journals, and institutional websites. Searches were undertaken in November 2019 and June 2020.

The team searched all the databases included in the [‘Database search’](#) table. For each database, the consultants used search strings based on a combination of three concepts:

- epidemic
- humanitarian response
- lessons

We used Boolean operator ‘OR’ to link each key aspect to its synonyms, and operator ‘AND’ to combine several notions. (See [‘3 Additional information on searches and tools’](#) for the key words and examples of search strings, and [‘Database search’](#) for all database searches conducted.)

Most of the website libraries were searched manually using simple search functions. Therefore, the team adjusted the search strings, and used a single search term – e.g. ‘epidemics’ – for some so as to ensure that each was comprehensively screened for all existing literature.

Beyond electronic searches, the consultants also reached out to a number of sources that provided relevant literature on Ebola responses. The team conducted:

- six telephone interviews with reference group members (see [‘2 The Delphi method’](#)).
- a forward citation search via Google Scholar to search for all literature citing the included studies.
- a backward citation search in which the research team reviewed the bibliography of each document rated as fit for inclusion to find further studies that the search strings may not have detected.

1.4 Data collection and analysis

Selection of studies

The screening and selection process took place in two stages. Exclusion filters were detailed in the Inception Report.

As a first step, the research analyst screened all titles and abstracts of the documents resulting from the search. Studies were classified as either ‘excluded’ or ‘included for step 2’. All studies classified as ‘included for step 2’ were registered in Zotero.¹ They were then screened by the same researcher. Studies were again classified as either ‘included’ or ‘excluded’, with the reason for exclusion recorded. See [Table 7: Exclusion table](#) for a list of all excluded studies.

Data extraction

The research team developed a detailed coding sheet (see ‘[3.6 Data synthesis table](#)’). The research analyst extracted and coded all the included studies to collect information about the population, the intervention, the context, the outcomes and the lessons learnt.

Quality appraisal

After data extraction, the team appraised the quality of each included study. To reduce the risk of bias, 5% of the studies were appraised by both the research analyst and the epidemiologist in the team to compare results and ensure consistency in ranking. The two researchers reconciled their approach. The level of agreement was high; only a few criteria in the tool had to be clarified to ensure consistency.

For the purpose of this evidence synthesis, a specific quality appraisal template was developed, building on the one created for a previous ALNAP Lesson Paper (see ‘[3.5 Quality appraisal tool](#)’). It is a mixed-methods critical appraisal tool with three modules: one for qualitative studies, one for quantitative studies and one for mixed-methods studies.

Data synthesis

The team prepared and organised an overview of the extracted data iteratively as themes emerged. This overview served to identify trends ahead of the thematic synthesis. While the studies identified to address the research questions are heterogeneous in terms of design, they are consistent in terms of lessons learnt, and the consultants found few contradictions across the included studies. The contradictions that emerged from the literature (such as lessons on coordination) also emerged from the Delphi group members and are highlighted in the paper. As such, it has been possible to synthesise lessons based on a satisfying number of studies (i.e. at least 4 studies, and 12 on average). See [Table 9: Papers per lesson](#) for a detailed overview of which paper contributed to which lesson. After the search, data extraction and quality appraisal, a Delphi process was conducted (see ‘[2 The Delphi method](#)’) to ensure the relevance of the lessons learned was extrapolated from the literature.

1. Zotero is an online tool for collecting, organising, citing and sharing documents and articles.

1.5 Search results

Key steps of the search

In **November 2019**, the team conducted a first search on both Ebola and cholera outbreaks since 2014. The team identified 2,776 records but, after screening their titles and abstracts, excluded 2,584 as irrelevant to the research question.

In **June 2020**, the team conducted a second search. The research team reran a search in the ALNAP Help Library, to include papers which did not appear in the first search due to a glitch in the system, and to search for papers published after November 2019 to include more lessons learned on the latest Ebola epidemic response in the DRC.

During this second search, the team identified 21,851 records, excluding 21,450 after title and abstract screening. The remaining 401 documents were imported into Zotero, which identified 91 duplicates. Six documents were added through the background citation search (documents quoted in the included texts) or through expert advice. A total of 316 documents were therefore included in Zotero for full-text screening. Of these, 27 documents were not accessible.

The authors excluded a further **104** studies, mostly because they featured no lessons learned (for example, they may have described interventions and results without reflecting on key takeaways and learnings), they were out of scope, or both. Other reasons for exclusion were:

- the document was only a summary
- the document was a blog or opinion piece
- the lessons included were too specific to a particular body and not applicable to humanitarian practitioners at large.

The research team also decided to remove those papers collected during the first phase of the search that were related only to cholera, because the breadth of evidence on cholera responses was too narrow (only 12 papers).

As a result, a total of **185** documents were used for this lessons paper. Figure 1 summarises the key steps of the search.

Characteristics of included papers

Among the 185 included studies on Ebola responses, 9 employed a mixed-methods approach, 170 were qualitative and 6 were quantitative. Of the total, 28 are evaluation reports, 84 are journal articles, 51 are research papers or reports, 17 are working papers, 3 are thematic notes, 1 is a policy paper and 1 is an activity report (see [Table 1: Type of study included in the lesson paper](#)).

Figure 1: Key steps of the search strategy

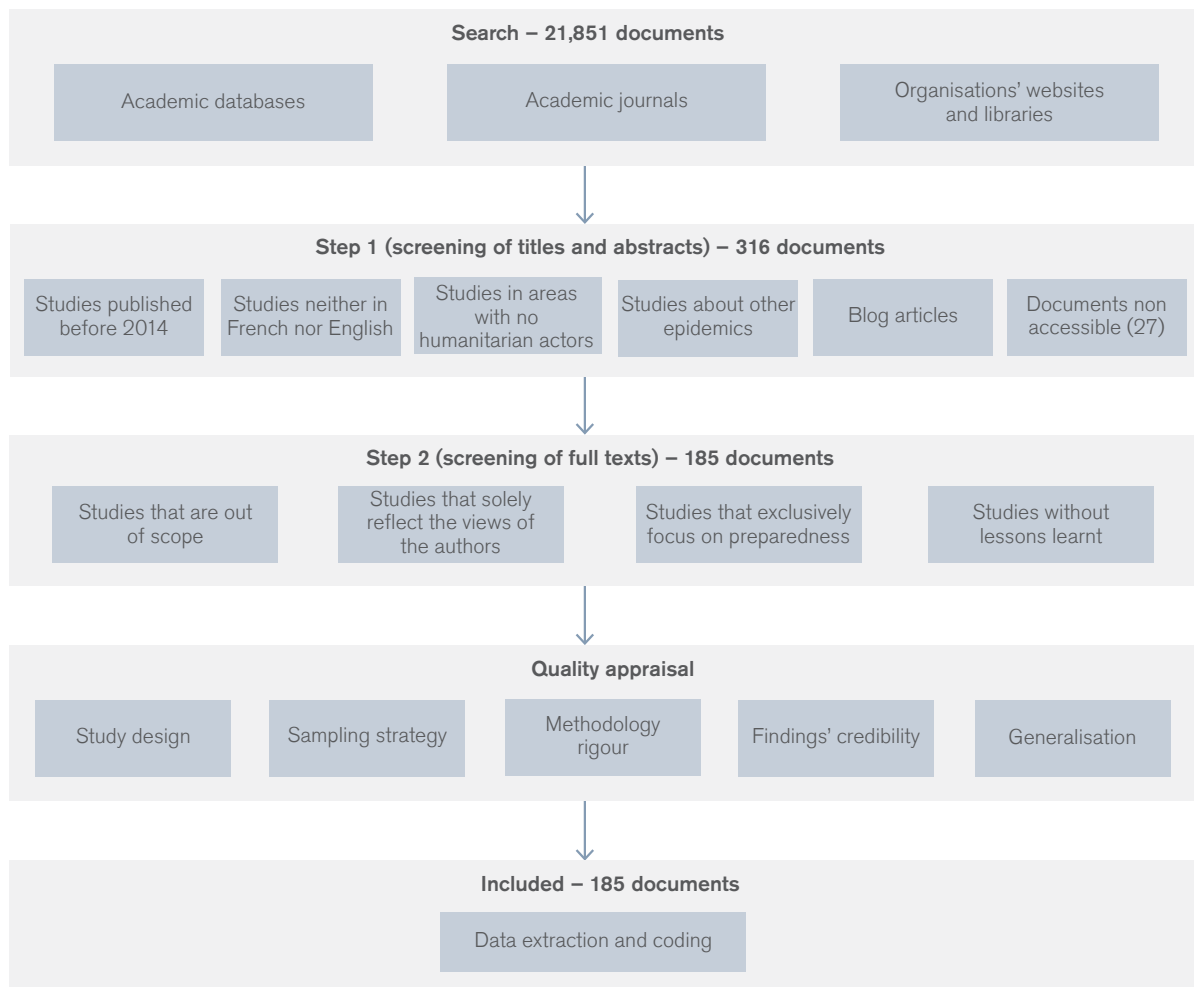


Table 1: Type of study included in the lesson paper

QA score	Author	Date	Title	Type of study
80	Abramowitz, S. et al.	2015	Community-centered responses to Ebola in urban Liberia: the view from below	Journal article
48	Abramowitz, S. et al.	2017	The opposite of denial: social learning at the onset of the Ebola emergency in Liberia	Journal article
91	Abramowitz, S. et al.	2016	Ebola community care centers: lessons learned from UNICEF's 2014-2015 experience in Sierra Leone	Working paper
55	ACAPS	2015	Ebola in West Africa - Guinea: resistance to the Ebola response	Thematic note
35	ACAPS	2015	Ebola outbreak, Sierra Leone: communication – challenges and good practices	Thematic note

16	ACAPS	2016	Beyond a public health: emergency: potential secondary humanitarian impacts of a large-scale Ebola outbreak	Thematic note
0	ACAPS	2015	Ebola outbreak in West Africa: challenges to the reintegration of affected groups into communities	Working paper
10	ACAPS	2015	WASH in Guinea, Liberia, and Sierra Leone: the impact of Ebola	Working paper
15	ACAPS	2015	Ebola outbreak in West Africa: lessons learned from assessments in Sierra Leone and Liberia	Working paper
26	ACAPS	2015	Ebola outbreak, Liberia: communication– challenges and good practices	Working paper
8	ACAPS	2015	Ebola in West Africa: impact on health systems	Working paper
45	Adams, J. et al.	2015	The Oxfam Ebola response in Liberia and Sierra Leone	Evaluation report
46	Adams, V.	2016	OCB Ebola review	Evaluation report
80	Age International	2015	Evaluation of Disasters Emergency Committee and Age International funded: responding to the Ebola outbreak in Sierra Leone through age-inclusive community-led action	Evaluation report
67	Ahmed, K. et al.	2019	Development and implementation of electronic disease early warning systems for optimal disease surveillance and response during humanitarian crisis and Ebola Outbreak in Yemen, Somalia, Liberia and Pakistan	Journal article
74	Alcayna-Stevens, L.	2018	Planning for post-Ebola: lessons learned from DR Congo's 9th epidemic	Research report
65	Androsik, A.	2020	Gendered understanding of Ebola crisis in Sierra Leone: lessons for COVID 19	Journal article
0	Ansumana, R. et al.	2017	Impact of infectious disease epidemics on tuberculosis diagnostic, management, and prevention services: experiences and lessons from the 2014–2015 Ebola virus disease outbreak in West Africa	Journal article
24	Ayoo, S. et al.	2016	Evaluation of IFRC West Africa Ebola Viral Disease Appeal Response: Sierra Leone and Liberia	Evaluation report
0	Baggio, O. et al.	2019	Bringing community perspectives to decision-making in the Ebola response in the Democratic Republic of Congo	Journal article
16	Barbisch, D. et al.	2015	Is there a case for quarantine? Perspectives from SARS to Ebola	Journal article
73	Batilo Momoh, H. et al.	2016	Evaluation of DEC Ebola Response Programme Phases 1 & 2	Evaluation report
52	Bayntun, C. and Zimble, S.-A.	2016	Evaluation of the OCG response to the Ebola outbreak: lessons learned from the Freetown Ebola treatment unit, Sierra Leone	Evaluation report
52	Beavogui, A.H. et al.	2016	Clinical research during the Ebola virus disease outbreak in Guinea: lessons learned and ways forward	Journal article

28	Bedford, J.	2018	Key considerations: burial, funeral and mourning practices in Équateur Province, DRC	Working paper
26	Bedford, J.	2018	Key considerations: health-seeking behaviours in Équateur Province, DRC	Working paper
17	Bond	2016	Bond and Ebola coordination: activity report	Activity report
0	Brandt, A. et al.	2017	Infant feeding policy and programming during the 2014–2015 Ebola Virus Disease outbreak in Sierra Leone	Journal article
0	Calain, P. and Poncin, M.	2015	Reaching out to Ebola victims: coercion, persuasion or an appeal for self-sacrifice?	Journal article
0	Campbell, L. et al.	2017	Learning from the Ebola response in cities: responding in the context of urban quarantine	Research paper
0	Campbell, L.	2017	Learning from the Ebola response in cities: population movement	Research paper
25	Campbell, L.	2017	Ebola response in cities: learning for future public health crises	Research paper
0	Campbell, L. and Miranda Morel, L.	2017	Learning from the Ebola response in cities: communication and engagement	Research paper
0	Cancedda, C. et al.	2016	Strengthening health systems while responding to a health crisis: lessons learned by a nongovernmental organization during the Ebola Virus Disease epidemic in Sierra Leone	Journal article
33	Carter, S.E. et al.	2018	Implementing a multisite clinical trial in the midst of an Ebola outbreak: lessons learned from the Sierra Leone trial to introduce a vaccine against Ebola	Journal article
30	Carter, S.E. et al.	2017	Mainstreaming gender in WASH: lessons learned from Oxfam's experience of Ebola	Research report
67	Carter, S.E. et al.	2017	Barriers and enablers to treatment-seeking behavior and causes of high-risk practices in Ebola: a case study from Sierra Leone	Journal article
67	Carter, S.E. et al.	2017	Treatment seeking and Ebola community care centers in Sierra Leone: a qualitative study	Journal article
100	Christensen, D. et al.	2020	Building resilient health systems: experimental evidence from Sierra Leone and the 2014 Ebola outbreak	Working paper
100	Christensen, D. et al.	2020	Community-based crisis response: evidence from Sierra Leone's Ebola outbreak	Journal article
25	Coltart, C.E.M. et al.	2017	The Ebola outbreak, 2013–2016: old lessons for new epidemics	Journal article
0	Cordner, C. et al.	2017	The Ebola epidemic in Liberia and managing the dead: a future role for Humanitarian Forensic Action?	Journal article
85	Czerniewska, A. and White, S.	2020	Hygiene programming during outbreaks: a qualitative case study of the humanitarian response during the Ebola outbreak in Liberia	Journal article
22	Davies, S. and Rushton, S.	2016	Public health emergencies: a new peacekeeping mission? Insights from UNMIL's role in the Liberia Ebola outbreak	Research paper

0	Dean, C. and Hawrylyshyn, K.	2015	Engaging young people in the Ebola response	Journal article
72	Denney, L. et al.	2016	Teenage pregnancy after Ebola in Sierra Leone: mapping responses, gaps and ongoing challenges	Working paper
56	Denney, L. et al.	2015	After Ebola: why and how capacity support to Sierra Leone's health sector needs to change	Research report
0	Diggins, J. and Mills, E.	2015	The pathology of inequality: gender and Ebola in West Africa	Research paper
52	DuBois, M. and Wake, C. with Sturridge, S. and Bennett, C.	2015	The Ebola response in West Africa: exposing the politics and culture of international aid	Working paper
28	Duda, R. et al	2018	Key considerations: engaging Twa communities in Équateur Province	Working paper
74	Dumas, T.	2016	Mitigating the impact of the Ebola Virus Disease on the most vulnerable households through an integrated food and nutrition security intervention in the district of Moyamba, Sierra Leone	Evaluation report
63	Dumas, T. et al.	2017	Harnessing digital technology for cash transfer programming in the Ebola response: lessons learned from USAID/Office of Food for Peace Partners' West Africa Ebola responses (2015–2016)	Research report
0	Elbe, S. and Roemer-Mahler, A.	2015	Global governance and the limits of health security	Journal article
0	Elmahdawy, M. et al.	2017	Ebola Virus epidemic in West Africa: global health economic challenges, lessons learned, and policy recommendations	Journal article
67	Fast, L. et al.	2016	Fighting Ebola with Information	Research report
58	Fearon, C.	2015	Humanitarian quality assurance: Sierra Leone – evaluation of Oxfam's humanitarian response to the West Africa Ebola crisis	Evaluation report
70	Featherstone, A.	2015	Keeping the faith: the role of faith leaders in the Ebola response	Research report
0	Fink-Hooijer, F. et al. (Humanitarian Practice Network)	2015	The Ebola crisis in West Africa	Research report
85	Gayla, C. et al.	2018	Evaluation of the USAID/OFDA Ebola Virus Disease outbreak response in West Africa 2014–2016: Objective 2 – Effectiveness of programmatic components	Evaluation report
74	Gillespie, A. et al.	2016	Social mobilization and community engagement central to the Ebola response in West Africa: lessons for future public health emergencies	Journal article
0	Global Communities	2015	Stopping Ebola in its tracks: a community-led response	Evaluation report
0	Gostin, L. et al.	2019	Fighting novel diseases amidst humanitarian crises	Research report
0	Gostin, L. and Friedman, E.A.	2015	A retrospective and prospective analysis of the West African Ebola virus disease epidemic: robust national health systems at the foundation and an empowered WHO at the apex	Journal article

80	Gray, N. et al.	2018	'When Ebola enters a home, a family, a community': a qualitative study of population perspectives on Ebola control measures in rural and urban areas of Sierra Leone	Journal article
50	Grépin, K.	2015	International donations to the Ebola virus outbreak: too little, too late?	Journal article
83	Grünewald, F.	2015	Ebola: the cost of poor global humanitarian governance in health	Research report
0	Grünewald, F. and Maury, H.	2014	Ebola, cholera and Chikungunya: health risks of the past, the present and the future	Research report
30	Grünewald, F. and Maury, H.	2020	Epidemics, pandemics and humanitarian challenges: lessons from a number of health crises	Research report
10	Grünewald, F. et al.	2017	MCDA deployment in natural disasters and health crises: the Ebola crisis	Research report
65	Guluma, Y.	2018	Outcome analysis: cash transfer programming response to the Ebola crisis in Sierra Leone and Liberia	Evaluation report
83	Haggman, H. et al.	2016	Occupational health for humanitarian aid workers in an Ebola outbreak	Journal article
10	Hallgarten, J.	2020	Four lessons from evaluations of the education response to Ebola	Research paper
38	Harman, S.	2016	Ebola, gender, and conspicuously invisible women in global health governance	Journal article
45	Herrick, C. and Brooks, A.	2020	Global health volunteering, the Ebola outbreak, and instrumental humanitarianisms in Sierra Leone	Journal article
0	Hoffman, D.	2016	A crouching village: Ebola and the empty gestures of quarantine in Monrovia	Journal article
75	Holding, M. et al.	2019	Learning from the epidemiological response to the 2014/15 Ebola Virus Disease outbreak	Journal article
0	House of Commons, International Development Committee	2016	Ebola: responses to a public health emergency	Policy paper
0	IFRC	2016	Beyond Ebola: from dignified response to dignified recovery	Working paper
31	Ilesanmi, O.S. et al.	2019	Evaluation of Ebola virus disease surveillance system in Tonkolili District, Sierra Leone	Journal article
42	International Rescue Committee	2016	The Ebola lessons reader	Research report
26	International Rescue Committee	2016	Ebola's psychosocial toll on frontline health workers: research brief 2016	Research report
0	Jacobsen K.H. et al.	2016	Lessons from the Ebola outbreak: action items for emerging infectious disease preparedness and response	Journal article

21	Jacquerioz Bausch, F.A. et al.	2018	Building local capacity in hand-rub solution production during the 2014–2016 Ebola outbreak disaster: the case of Liberia and Guinea	Journal article
41	Jobanputra, K. et al.	2017	Electronic medical records in humanitarian emergencies: the development of an Ebola clinical information and patient management system	Research report
28	Johnson, O. et al.	2016	Ebola holding units at government hospitals in Sierra Leone: evidence for a flexible and effective model for safe isolation, early treatment initiation, hospital safety and health system functioning	Journal article
0	Kamradt-Scott, A.	2016	WHO's to blame? The World Health Organization and the 2014 Ebola outbreak in West Africa	Journal article
26	Kasali, N.	2019	Community responses to the Ebola response: Beni, North Kivu	Research report
0	Kékulé, A.	2015	Learning from Ebola Virus: how to prevent future epidemics	Journal article
0	Kieny, M.-P.	2018	Lessons learned from Ebola vaccine R&D during a public health emergency	Journal article
16	Koch, T.	2016	Ebola in West Africa: Lessons we may have learned	Journal article
13	Koch, T.	2016	Fighting disease, like fighting fires: the lessons Ebola teaches	Journal article
74	Kodish, S.R. et al.	2019	Consensus building around nutrition lessons from the 2014–16 Ebola virus disease outbreak in Guinea and Sierra Leone	Journal article
76	Kodish, S.R. et al.	2019	Implications of the Ebola virus disease outbreak in Guinea: qualitative findings to inform future health and nutrition-related responses	Journal article
74	Kodish, S.R. et al.	2019	A qualitative study to understand how Ebola Virus Disease affected nutrition in Sierra Leone: a food value-chain framework for improving future response strategies	Journal article
0	Koenig, K.	2015	Health care worker quarantine for Ebola: to eradicate the virus or alleviate fear?	Journal article
72	Konteh, F.	2017	After the outbreak: analysis of the post-Ebola recovery period of Sierra Leone and Liberia with lessons for future health emergencies	Research report
59	Konyndyk, J.	2019	Struggling with scale: Ebola's lessons for the next pandemic	Research report
100	Kraemer, M. et al.	2020	Dynamics of conflict during the Ebola outbreak in the Democratic Republic of the Congo 2018-2019	Journal article
100	Kucharski, A. et al.	2015	Evaluation of the benefits and risks of introducing Ebola community care centers, Sierra Leone	Journal article
46	Kutalek, R. et al.	2015	Ebola interventions: listen to communities	Journal article
26	Laverack, G. and Manoncourt, E.	2016	Key experiences of community engagement and social mobilization in the Ebola response	Journal article
0	Lee, T.-S.	2016	Making international health regulations work: lessons from the 2014 Ebola Outbreak	Journal article

87	Lees, S. et al.	2020	Contested legitimacy for anthropologists involved in medical humanitarian action: experiences from the 2014-2016 West Africa Ebola epidemic	Journal article
28	Lupel, A. and Snyder, M.	2017	The mission to stop Ebola: lessons for UN crisis response	Research report
9	Mallet, R. and Denney, L.	2015	After Ebola: towards a smarter model of capacity building	Research report
92	Mallow, M. et al.	2018	WASH activities at two Ebola treatment units in Sierra Leone	Journal article
79	Masumbuko, C.K. et al.	2019	Social resistance drives persistent transmission of Ebola Virus Disease in Eastern Democratic Republic of Congo: a mixed-methods study	Journal article
100	McQuilkin, P.A. et al.	2017	Health-care access during the Ebola virus epidemic in Liberia	Journal article
12	Médecins Sans Frontières	2016	MSF supported research on Ebola	Research report
0	Médecins Sans Frontières	2020	After the fire: how we could have better managed DRC Ebola outbreak	Research paper
84	Mercy Corps	2014	Economic impact of the Ebola crisis on select Liberian markets	Research report
54	Meyer, D. et al.	2018	Lessons from the domestic Ebola response: improving health care system resilience to high consequence infectious diseases	Journal article
65	Minor, O.	2017	Ebola and accusation: gender and stigma in Sierra Leone's Ebola response	Research report
0	Mobula, L. et al.	2020	Recommendations for the COVID-19 response at the national level based on lessons learned from the Ebola Virus Disease outbreak in the Democratic Republic of the Congo	Journal article
0	Mohammed, A. et al.	2015	Mental health in emergency response: lessons from Ebola	Journal article
0	Moon, S. et al.	2017	Post-Ebola reforms: ample analysis, inadequate action	Journal article
0	Moon, S. et al.	2015	Will Ebola change the game? Ten essential reforms before the next pandemic — the report of the Harvard-LSHTM Independent Panel on the Global Response to Ebola	Journal article
84	Morin, C. et al.	2018	Information circulation in times of Ebola: Twitter and the sexual transmission of Ebola by survivors	Journal article
85	Morlai, T.	2017	Protecting the living, honouring the dead: the barriers and enablers to community acceptance and implementation of safe burials	Evaluation report
61	Mupko, A.	2015	Surviving Ebola: public perceptions of governance and the outbreak response in Liberia	Research report
63	Murray, A. et al.	2015	Report of the real-time evaluation of Ebola control programs in Guinea, Sierra Leone and Liberia	Evaluation report

0	Nagai, M. et al.	2020	Can we apply lessons learned from Ebola experience in West Africa for COVID-19 in lower income countries?	Journal article
0	Nevin, R. and Anderson, J.	2016	The timeliness of the US military response to the 2014 Ebola disaster: a critical review	Journal article
33	Niederberger, E. et al.	2016	Guide to Community Engagement in WASH: a practitioner's guide, based on lessons from Ebola	Working paper
0	O'Callaghan, S.	2020	Can we apply lessons learned from Ebola experience in West Africa for COVID-19 in lower income countries?	Research paper
26	Olu, O. et al.	2016	Incident management systems are essential for effective coordination of large disease outbreaks: perspectives from the coordination of the Ebola outbreak response in Sierra Leone	Journal article
0	Olu, O. et al.	2020	What did we learn from preparing for cross-border transmission of Ebola virus disease into a complex humanitarian setting, the Republic of South Sudan?	Journal article
0	Onoma, A.	2016	Rites of mobility and epidemic control: Ebola Virus Disease in the Mano River Basin	Journal article
0	Oosterhoff, P.	2015	Local engagement in Ebola outbreaks and beyond in Sierra Leone	Research paper
0	Oxfam	2015	Quarantines in Sierra Leone	Research paper
61	Oza, S. et al.	2019	Improving health information systems during an emergency: lessons and recommendations from an Ebola treatment centre in Sierra Leone	Journal article
68	Park, C.	2020	Traditional funeral and burial rituals and Ebola outbreaks in West Africa: a narrative review of causes and strategy interventions	Journal article
35	Peyton, D. et al.	2019	Key considerations: Ebola preparedness and readiness in Goma, DRC	Working paper
0	Piot, P. et al.	2019	Emergent threats: lessons learnt from Ebola	Journal article
70	Platt, A. and Kerley, L.	2016	External evaluation of Plan International UK's response to the Ebola virus outbreak in Sierra Leone	Evaluation report
65	Polygeia	2016	Lessons from Ebola affected communities	Research report
86	Pronyk, P. et al.	2016	The effect of community-based prevention and care on Ebola transmission in Sierra Leone	Journal article
0	Quinn, M.	2016	Governance and health in post-conflict countries: the Ebola outbreak in Liberia and Sierra Leone	Research report
26	Radice, H.W.	2017	Cash transfers for food security in epidemics: a review of the USAID Food for Peace response to the Ebola crisis in Liberia and Sierra Leone	Evaluation report
83	Ratnayake, R. et al.	2016	Assessment of community event-based surveillance for Ebola Virus Disease, Sierra Leone, 2015	Research paper
0	Ripoll, S. et al.	2018	Social science lessons learned from Ebola epidemics	Research report

80	Risso-Gill, I. and Finnegan, L.	2015	Children's Ebola Recovery Assessment Report (CERA): Sierra Leone	Research report
0	Rohan, H. and McKay, G.	2020	The Ebola outbreak in the Democratic Republic of the Congo: why there is no 'silver bullet'	Journal article
0	Rohwerder, B.	2014	Impact and implications of the Ebola crisis	Research report
94	Roshania, R. et al.	2016	Successful implementation of a multicounty clinical surveillance and data collection system for Ebola Virus Disease in West Africa: findings and lessons learned	Journal article
0	Royo-Bordonada, M. and García López, F.	2016	Ethical considerations surrounding the response to Ebola: the Spanish experience	Journal article
70	Rubin, G. et al.	2016	How to support staff deploying on overseas humanitarian work: a qualitative analysis of responder views about the 2014/15 West African Ebola outbreak	Journal article
74	Ryan, M. et al.	2019	Technologies of trust in epidemic response: openness, reflexivity and accountability during the 2014–2016 Ebola outbreak in West Africa	Journal article
85	Sadaphal, S. et al.	2018	Evaluation of the USAID/OFDA Ebola virus disease outbreak response in West Africa 2014–2016: Objective 1 – Effectiveness of the response	Evaluation report
74	Schofield, R.	2016	DEC funded Ebola response programme in Sierra Leone	Evaluation report
63	Shapiro, I.	2018	Collaborating, learning & adapting case analysis: deep dive – global communities' Ebola response in Liberia	Research report
59	Sheperd, M. et al.	2017	An evaluation of WFP's L3 response to the Ebola Virus Disease (EVD) crisis in West Africa (2014– 2015)	Evaluation report
0	Shucksmith-Wesley, C. et al.	2020	The International Red Cross and Red Crescent Movement response to the West African Ebola outbreak 2014	Journal article
41	Siekman, K. et al.	2017	Community-based health care is an essential component of a resilient health system: evidence from Ebola outbreak in Liberia	Journal article
39	Smith, M.J. and Upshur, R.E.G.	2015	Ebola and learning lessons from moral failures: who cares about ethics?	Journal article
22	Stanley, M.	2019	Real-time evaluation of World Vision DRC's Ebola virus disease emergency response	Evaluation report
85	Steven, H. et al.	2018	Evaluation of the USAID/OFDA Ebola virus disease outbreak response in West Africa 2014–2016: Objective 4 – Coordination of the response	Evaluation report
24	Sustersic, L.	2015	Ebola response system strengthening along Western Area Peninsula Coastline	Evaluation report
24	Sustersic, L.	2015	Quarantine in Sierra Leone: lessons learned	Research paper
26	Sweet, R. and Bedford, J.	2018	WhatsApp and Local Media (Grand Nord): RELUCTANCE, refusal, resistance and the politicisation of the Ebola response	Research report
0	The Dalberg Group	2015	From response to recovery in the Ebola crisis	Research report

0	The Ebola Research Group	2019	Responding to the Ebola virus disease outbreak in DR Congo: when will we learn from Sierra Leone?	Journal article
78	The Khana Group	2016	CARE International DEC Ebola Emergency Response Project	Evaluation report
0	Thielman, N.M. et al.	2016	Ebola clinical trials: five lessons learned and a way forward	Journal article
8	Thomson, S. and Bolton, L.	2014	Helpdesk report: Ebola regional lesson learning	Research report
0	Translators Without Borders	2017	Words of relief: Ebola crisis learning review	Evaluation report
76	Translators Without Borders	2019	We need to talk: an assessment of changing communication needs and preferences in Beni, north Kivu	Evaluation report
0	UNDP	2015	Recovering from the Ebola crisis: A summary report	Research report
54	UNDP	2014	Assessing the socioeconomic impacts of Ebola Virus Disease in Guinea, Liberia and Sierra Leone	Research report
56	UNICEF	2016	Evaluation of UNICEF's response to the Ebola outbreak in West Africa 2014–2015	Evaluation report
0	United Nations Development Group (UNDG) – Western and Central Africa	2015	Socio-economic impact of Ebola Virus Disease in West African countries	Research report
35	UN, World Bank, EU and African Development Bank	2015	Recovering from the Ebola crisis	Research report
0	USAID	2019	Building back better: Sierra Leone's journey to self-reliance	Evaluation report
100	Vinck, P. et al.	2019	Institutional trust and misinformation in the response to the 2018–19 Ebola outbreak in North Kivu, DR Congo: a population-based survey	Journal article
0	Wake, C.	2015	The role of fear in the Ebola response	Research report
0	Waldman, L.	2015	Urbanisation, the peri-urban growth and Zoonotic disease	Journal article
0	Walldorf, J. et al.	2017	Lessons learned from emergency response vaccination efforts for cholera, typhoid, yellow fever, and Ebola	Journal article
55	Wells, C.R. et al.	2019	The exacerbation of Ebola outbreaks by conflict in the Democratic Republic of the Congo	Journal article
0	WHO	2015	Ebola response: what needs to happen in 2015	Working paper
0	WHO	2015	Report of the Ebola Interim Assessment Panel	Working paper
0	Wilkinson, A. et al.	2017	Engaging 'communities': anthropological insights from the West African Ebola epidemic	Journal article

0	Wilkinson, A. and Leach, M.	2015	Briefing: Ebola–myths, realities, and structural violence	Journal article
78	Yates, T. et. al.	2017	Evidence synthesis: WASH interventions in disease outbreak response	Research report
56	YMCA	2016	Sierra Leone YMCA Ebola outbreak response	Evaluation report
54	YMCA	2015	Liberia YMCA Ebola outbreak emergency response	Evaluation report

Overall, the quality of the included studies; design and methodology was poor (the average grade is 36 out of 100). Apart from a few academic studies and some evaluations, a third of the documents included little or limited information on the methodology. The main reason for this was that most documents aimed to be use-oriented and to provide practical recommendations and lessons to help donors, NGOs, UN agencies, local governments and others involved in epidemic response improve their work. Despite this, the team decided to keep all documents after the quality appraisal, since they all presented supporting evidence of some kind (based on experience, interviews, references to past projects, etc.) for the lessons contained in them.

The consultants acknowledge the risk of bias in this paper (i.e. the underreporting of studies establishing negative or mixed evaluation findings). Nonetheless, this risk appears to be reasonable considering that many (if not most) of the lessons included in this paper are based on reported failures of, and challenges faced by, the humanitarian community during an epidemic response.

Another potential bias is due to the fact that the results of the database search barely included documents on government-led responses to epidemics. As a result, this paper may lack lessons on government-led responses and activities.

Characteristics of included responses

The research team initially expected to focus on major epidemics since 2010, including cholera and Ebola. The research question was later changed to focus only on Ebola outbreaks, as the literature review showed that the breadth of evidence for lessons on cholera responses was too narrow (only 12 papers discussed cholera), despite the fact that cholera is more prevalent and affects far more people.

Table 2: Ebola outbreaks (2014–2020)

Date	Country	Disease	# of cases	# of deaths
2014–2016	Sierra Leone, Liberia, Guinea	Ebola	28,616	11,310
2017	DRC	Ebola	5	4
2018	DRC	Ebola	54	33
2018–2020	DRC	Ebola	3,481	2,299

2 The Delphi method

To improve the relevance of the lessons learned, the consultants used the Delphi method. Relevance is often overlooked in evidence synthesis methods, which results in very general findings. To translate the findings into actionable recommendations, practitioners who have participated in Ebola responses in West Africa and the DRC have been included in the process (as explained in this section). The Delphi approach is used to create ownership, ensure a collaborative approach to harnessing, and generate a consensus by relying on a panel of experts. Here, the approach was used to gather inputs from a range of experts and practitioners on Ebola outbreak responses to:

- mitigate researcher bias in the synthesis of lessons
- add lessons or literature that had been missed
- ensure that lessons were relevant to the decision-making context of Ebola outbreaks
- make where possible identified lessons more specific and action-guiding, based on consensus across a representative body of experience.

2.1 The reference group

A reference group of six experts supported and informed the process: the consultants conducted interviews with the experts so they could share their experiences with Ebola responses and identify unpublished literature. As this lessons paper is geared towards non-health specialists, and thus a wide range of practitioners with experience in Ebola responses, the reference group was composed of representatives of different sectors, with a focus on operational implementation. These six experts therefore represented the following organisations and subsequent sectoral expertise:

- United Nations Office for the Coordination of Humanitarian Affairs (OCHA) (Linda Poteat, Ebola Coordinator in DRC)
- Global Water, Sanitation & Hygiene (WASH) Cluster (Karine Deniel, UNICEF WASH specialist)
- Global Health Cluster (Linda Doull, World Health Organization)
- Médecins Sans Frontières (MSF) (Ella Watson Stryker, epidemiologist with MSF)
- National Society of the Red Cross (Thomas Abu, National Society of the Red Cross in Sierra Leone)
- academics (Larissa Fast, Researcher HCRI Manchester)

The six experts answered the following questions:

- What is your current role?
- Could you describe your experience in Ebola response(s)?
- Based on the intended audience and purpose of the lessons paper, what areas would you expect to see covered?
- Are you aware of literature that addresses these areas?
- Who would you recommend take part in the Delphi process?

2.2 The expert group

With support from the reference group, the research team then established an expert group of 26 people to be part of the Delphi process. All reference group members were also by default members of the expert group. Expert group members represented different sectors and functions. Based on the literature review, a sampling frame was developed to target areas of expertise relevant to an Ebola response. Experts were then selected from these areas to participate in the Delphi method. Beyond health, the paper focuses on lessons learned on WASH, livelihoods/food security, coordination, funding, and social science.

Table 3 sets out the sectors and organisations, both in the DRC and in West Africa, represented by the expert group.

The expert group's involvement consisted of responding to the Delphi questionnaires. Consultants conducted two rounds of data collection, and hence two rounds of questions. These questions sought to identify whether the lessons harvested from the literature review seemed coherent with the experts' experience and whether any lessons were missing. Data was collected remotely in English, using Kobo questionnaires.

Table 3: Composition of the Delphi expert group

Type of actor	Organisation	Sector
West Africa		
National NGO/ Red Cross	Red Cross Sierra Leone	Health and safe burials
INGO	MSF	Health
INGO	The Alliance for International Medical Action	Health
UN	WHO	Health
UN	UNICEF	WASH
IFRC	IFRC	Health and safe burials
Cluster	Global Health Cluster	Coordination
UN coordination	WHO	Coordination
Researcher	Anthrologica	Anthropology
Donor	USAID/ Office of US Foreign Disaster Assistance (OFDA)	NA

DRC		
INGO	Oxfam	M&E and Gender
IFRC	IFRC	Health and safe burials
UN	UNICEF	WASH
UN coordination	OCHA	Coordination
Research Group	Humanitarian Policy Group, Overseas Development Institute	NA
Consultant	Independent	M&E
Donor	OFDA	NA
General		
Research Group	Groupe URD	NA
Research Group	ODI	NA
Academic researcher	Humanitarian and Conflict Response Institute (HCRI) Manchester	NA

First round

In the first round of the Delphi process, the consultants shared a long list of all the lessons identified as a result of the data collection (45 lessons).

Experts answered the following questions about each of the lessons:

This is the one of the lessons that emerged from the literature. How much do you think it should be made a priority in the lessons paper (i.e. is it Ebola-specific and a priority for a successful Ebola response)?

- 5 Very high priority
- 4 High priority
- 3 Medium priority
- 2 Low priority
- 1 Not a priority
- 0 Not a relevant lesson

- If you think this is an irrelevant lesson, is it based on the content or on the phrasing of the lesson? If on the phrasing, how should it be rephrased? Can it be merged with another lesson? If on the content, why do you think the lesson is irrelevant?
- Is there anything else you or others have learned during the Ebola response that you think would be useful for future humanitarian responses to Ebola and does not currently appear?

If a new lesson is suggested:

- Is there any documented evidence to support this lesson that you can share with us?

The lessons that received a majority of 'disagree' responses were either removed, rephrased or merged with other lessons, so that the lessons (and potential categories of lessons) remained conceptually meaningful to the experts.

Of the 26 expert group members, 22 responded to the first round questionnaire, for an overall response rate of 85%.

Number of lessons that received a 100% consensus	15
Number of lessons that received a 90%–95% consensus	19
Number of lessons that received less than a 90% consensus	11

Second round

The second round of the Delphi process presented a short list of lessons (22) to the expert group members, who then answered the following questions:

This is a lesson that was suggested during the first round of Delphi consultation. How much do you think it should be made a priority in the lesson paper (i.e. is it Ebola-specific and a priority for a successful Ebola response)?

- 5 Very high priority**
- 4 High priority**
- 3 Medium priority**
- 2 Low priority**
- 1 Not a priority**
- 0 Not a relevant lesson**

Do you have any examples to share to illustrate this lesson?

Of the 26 expert group members, **13 responded**, for an overall response rate of **50%**.

Number of lessons that received a 100% consensus	15
Number of lessons that received a 90%–95% consensus	6
Number of lessons that received less than a 90% consensus	1

3 Additional information on searches and tools

3.1 Key words and search strings

The authors developed key search terms to address the research question (Table 3). The terms related to cholera (i.e. ‘cholera’, ‘Haiti’, ‘Yemen’, ‘Mozambique’) were removed for the second phase of the research.

Table 4: List of key words for search

Epidemic	Response	Lessons
Cholera	Humanitarian	Lessons learnt
Ebola	Relief	Learning
Haiti	Recovery	Impact
West Africa	Emergency	Assessment
Sierra Leone	Public health intervention	Review
Liberia	Health promotion	Result
Guinea	WASH	Consequence
Yemen	Livelihoods	Evaluation
DRC	Food security	
Mozambique		

Based on these key words, the authors developed search strings for each database, whether academic or institutional. The authors used the Boolean operator ‘OR’ to link each key aspect to its synonyms, and the operator ‘AND’ to combine several terms.

For example: (Ebola epidemic) AND (humanitarian OR humanitarian response OR relief OR recovery) AND (lessons OR lessons learnt OR impact OR assessment OR review OR evaluation).

Search strings were tested and adapted to the specificities of each database. For instance, institutional databases often did not take Boolean operators into account, so the team used a simplified search string with just three to four words.

3.2 Database search

Table 5: Hits per databases in November 2019

Database name	Search string used (use one line per search string)	Date and time of search	Total # of hits	# of excluded hits (Step 1)	Main reasons for exclusion after Step 1	In Zotero
ELDIS	Cholera	30 Oct @ 13:54	49	46	Blog posts; not relevant; outside of timeframe	3
ELDIS	Ebola	30 Oct @ 14:24	67	52	Outside of scope	15
ELLA	Ebola	30 Oct @ 18:09	4	3	Not relevant	1
ELLA	Cholera	30 Oct @ 18:13	4	4	Not relevant	0
PUBMED	Cholera OR Ebola AND humanitarian	31 Oct @ 09:52	176	114	Outside of scope	62
Google Scholar	All key words with Boolean operators	31 Oct @ 12:31	500	423	Outside of scope; not relevant	77
Third World Quarterly	Ebola OR cholera AND humanitarian AND lessons learned	4 Nov @ 15:42	19	15	Not relevant	4
Disasters	Ebola	4 Nov @ 15:55	12	11	Not relevant	1
Disasters	Cholera AND humanitarian AND lessons	4 Nov @ 16:00	20	20	Not relevant; outside of scope	0
Journal of Refugee Studies	Ebola	4 Nov @ 16:05	3	3	Not relevant	0
Journal of Refugee Studies	Cholera	4 Nov @ 16:06	14	14	Not relevant; outside of scope	0
British Medical Journal	Ebola AND humanitarian AND lessons	4 Nov @ 16:17	17	14	Not relevant; news articles	3
British Medical Journal	Cholera AND humanitarian AND lessons	4 Nov @ 16:38	42	42	Not relevant; outside of scope	0
ODI	Ebola OR cholera AND humanitarian AND lessons learned	4 Nov @ 16:46	123	122	Not relevant; outside of scope	1
ALNAP HELP	Cholera AND humanitarian AND lessons	4 Nov @ 17:03	58	56	Not relevant	2
ALNAP HELP	Ebola AND humanitarian AND lessons	16 Dec @ 16:17	74	68	Not relevant, no lessons/duplicate	6
International Initiative for Impact Evaluation (3ie)	Ebola OR Cholera AND humanitarian AND lessons	6 Nov @ 14:40	208	208	Not relevant/ duplicates	0
Practical Action	N/A	6 Nov @ 14:50	0	0		0
IFRC	Ebola AND lessons	6 Nov @ 14:56	13	11	Outside of scope	2

IFRC	Cholera AND lessons	6 Nov @ 14:59	2	2	Not relevant	0
WHO	Ebola AND humanitarian AND lessons learned	6 Nov @ 15:06	56	52	Outside of scope	4
WHO	Cholera AND humanitarian AND lessons learned	6 Nov @ 15:21	15	15	Not relevant	0
UNICEF	Ebola AND lessons learned	6 Nov @ 15:25	46	45	Not relevant	1
UNICEF	Cholera AND lessons learned	6 Nov @ 15:31	34	34	Not relevant	0
OCHA	Ebola OR cholera AND humanitarian	6 Nov @ 15:34	190	190	No lessons learned, only press releases	0
ICRC	Ebola AND humanitarian	6 Nov @ 15:46	61	61	No lessons learned	0
ICRC	Cholera AND humanitarian	6 Nov @ 15:48	164	164	No lessons learned	0
MSF	Ebola AND humanitarian	6 Nov @ 15:57	56	55	No lessons learned	1
MSF	Ebola AND humanitarian	6 Nov @ 16:05	256	256	No lessons learned	0
MSF-Crash	Ebola OR cholera	6 Nov @ 16:22	17	14	Outside of scope	3
MDM	Ebola OR cholera	6 Nov @ 16:35	120	119	No lessons learned	1
ALIMA	Ebola	7 Nov @ 14:01	10	10	No lessons learned	0
ALIMA	Cholera	7 Nov @ 14:04	10	10	Not relevant	0
Medical Corps	Ebola	7 Nov @ 14:06	20	18	No lessons learned	2
Medical Corps	Cholera	7 Nov @ 14:07	20	20	No lessons learned	0
Oxfam	Ebola AND lessons	7 Nov @ 14:16	3	2	Duplicates	1
Oxfam	Cholera AND lessons	7 Nov @ 14:20	1	0	N/A	1
Solidarités International	Tags to select: cholera	7 Nov @ 14:27	3	3	No lessons learned	0
DFID	Boxes ticked: ▪ Theme: Health ▪ Countries: DRC, Guinea, Haiti, Liberia, Mozambique, Sierra Leone, Yemen ▪ Published after: 2010	7 Nov @ 14:35	139	139	Not relevant/no lessons	0
ECHO	Ebola AND cholera AND humanitarian	7 Nov @ 14:45	49	49	No lessons learned	0
USAID	Ebola/cholera	7 Nov @ 14:54	0	0	0	N/A
Centers for Disease Control and Prevention	Ebola OR cholera AND humanitarian AND lessons	7 Nov @ 14:57	101	100	Outside of scope; not relevant	1
TOTAL			2,776	2,584		192
	Duplicates in Zotero			6	Final total	186

Table 6: Hits per databases in June 2020

Database name	Search string used (use one line per search string)	Filters: after Nov 2019	Date and time of search	Total # of hits	Main reasons for exclusion after Step 1	In Zotero
ELDIS	Ebola	Newest published	16/06/2020 @10:00	67	Nothing after Nov 2019; duplicates	0
ELLA	Ebola	N/A	16/06/2020 @10:15	3	Nothing after Nov 2019; duplicates	0
PUBMED	Ebola AND humanitarian	2019- 2020	16/06/2020 @10:25	40	Before Nov 2019; not relevant; duplicates	9
Google Scholar	Ebola AND humanitarian	Since 2019	16/06/2020 @10:35	2,900	Before Nov 2019; not relevant; duplicates	18
Third World Quarterly	Ebola AND humanitarian	2019- 2020	16/06/2020 @12:45	1	Not relevant; duplicates	0
Disasters	Ebola	11/2019- 06/2020	16/06/2020 @12:50	1	Not relevant; duplicates	0
Journal of Refugee Studies	Ebola	11/2019- 06/2020	16/06/2020 @12:55	2	Not relevant; duplicates	0
British Medical Journal	Ebola AND humanitarian	11/2019- 06/2020	16/06/2020 @13:00	3	Not relevant; duplicates	0
ODI	Ebola AND humanitarian	2019- 2020	16/06/2020 @13:05	17	Not relevant; duplicates	1
ALNAP HELP	Ebola	N/A	14/05/2020 @14:25	1,155	Not relevant; duplicates	174
International Initiative for Impact Evaluation (3ie)	Ebola AND humanitarian	N/A	16/06/2020 @13:10	53	Not relevant; duplicates	0
Practical Action	Ebola	N/A	16/06/2020 @13:15	2	Outside of scope; duplicates	0
International Federation of the Red Cross and Red Crescent (IFRC)	Ebola	Newest published	16/06/2020 @13:20	6,460	Before Nov 2019; not relevant; duplicates	0
WHO	Ebola AND humanitarian	Newest published	16/06/2020 @13:30	7,065	Before Nov 2019; outside of scope; duplicates	0
UNICEF	Ebola	11/2019- 06/2020	16/06/2020 @13:40	53	Outside of scope; duplicates	0
OCHA	Ebola AND humanitarian	N/A	16/06/2020 @13:45	34	Outside of scope; duplicates	0
ICRC	Ebola	2019- 2020	16/06/2020 @13:50	6	Outside of scope; duplicates	0
MSF	Ebola	2019- 2020	16/06/2020 @13:55	41	Outside of scope; duplicates	1
MSF CRASH	Ebola	Newest published	16/06/2020 @14:00	48	Before Nov 2019; outside of scope; duplicates	0

MDM	Ebola	N/A	16/06/2020 @15:30	22	Outside of scope; duplicates	0
ALIMA	Ebola	N/A	16/06/2020 @15:40	10	Outside of scope; duplicates	0
Medical Corps	Ebola	N/A	16/06/2020 @15:45	20	Outside of scope; duplicates	0
OXFAM	Ebola	N/A	16/06/2020 @15:50	75	Outside of scope; duplicates	1
Solidarités International	Ebola	N/A	16/06/2020 @15:55	27	Outside of scope; not relevant; duplicates	1
DFID	Ebola	N/A	16/06/2020 @16:00	59	Not relevant; duplicates	0
ECHO	Ebola	N/A	16/06/2020 @16:05	35	Outside of scope; not relevant; duplicates	0
USAID	Ebola AND humanitarian	N/A	16/06/2020 @16:10	842	Outside of scope; not relevant; duplicates	3
Centers for Disease Control and Prevention	Ebola	11/2019-06/2020	16/06/2020 @16:40	34	Not relevant; duplicates	1
TOTAL				19,075		209
Duplicates in Zotero					Final total	124

3.3 Exclusions

The following table details the 104 studies that were excluded after the full screening of documents, and the reason why.

Table 7: Exclusion table

Article reference	Reason for exclusion after step 2
Abramowitz, S. et al. (2018) Lessons from the West Africa Ebola epidemic: a systematic review of epidemiological and social and behavioral science research priorities	No lessons learned on humanitarian response
Abubakar A. et al. (2015) The first use of the global oral cholera vaccine emergency stockpile: lessons from South Sudan	Cholera
Alcanya-Stevens, L. and Bedford, J. (2018) Key considerations: the context of Équateur Province, DRC	No lessons learned (only contextual information)
Aruna, A. et al. (2019) Ebola Virus Disease Outbreak: Democratic Republic of the Congo, August 2018 – November 2019	No lessons learned (only contextual information)
Black, S.C. and Achar, J. (2015) Ebola viral disease and pregnancy	No lessons learned on humanitarian response
Bradol, J.-H. (2016) The response to the Ebola epidemic: negligence, improvisation and authoritarianism	Outside of scope

Bradol, J.-H. and Rahmouni, E. (2019) Ebola outbreak: a failure in social mobilisation	Outside of scope
Brim, B. and Wenham, C. (2019) Pandemic emergency financing facility: struggling to deliver on its innovative promise	Outside of scope
Burton, R. (2015) Ebola: lessons learned	Outside of scope
Campbell, L. and Knox Clark, P. (2018) Making operational decisions in humanitarian response: a literature review	Outside of scope, no lessons learned specific to epidemics
CDC (2020) Lessons Learned from Ebola Improve CDC's Global Response	No lessons learned specific to the Ebola response
Checchi, F. and al. (2016) World Health Organization and emergency health: if not now, when?	Lessons on WHO and not specific to the Ebola outbreaks
Childs, L. et al. (2016) Evaluation of knowledge and practices regarding cholera, water treatment, hygiene, and sanitation before and after an oral cholera vaccination campaign—Haiti, 2013–2014	Cholera
Dhillon, P. and Annunziata, G. (2012) The Haitian Health Cluster experience: a comparative evaluation of the professional communication response to the 2010 earthquake and the subsequent cholera outbreak	Outside of scope
Downes, E. (2015) Nursing and complex humanitarian emergencies: Ebola is more than a disease	No lessons learned
Draper, H. and Jenkins, S. (2017) Ethical challenges experienced by UK military medical personnel deployed to Sierra Leone (operation GRITROCK) during the 2014–2015 Ebola outbreak: a qualitative study	Outside of scope
Drexler, M. (2015) The Ebola response: a special report	Newspaper article, no lessons learned
Ellenberg, S. and al. (2018) Rigorous clinical trial design in public health emergencies is essential	Outside of scope
Fairhead, J. (2014) The significance of death, funerals and the afterlife in Ebola-hit Sierra Leone, Guinea and Liberia: Anthropological insights into infection and social resistance	Outside of scope, no lessons learned
Fearon, C. (2013) Evaluation of Sierra Leone cholera response 2012 project effectiveness review	Cholera
Federspiel, F. and Ali, M. (2018) The cholera outbreak in Yemen: lessons learned and way forward	Cholera
Forestier, C. et al. (2016) Coordination and relationships between organisations during the civil–military international response against Ebola in Sierra Leone: an observational discussion	Outside of scope, no lessons learned
Gee, S. and Skovdal, M. (2017) The role of risk perception in willingness to respond to the 2014–2016 West African Ebola outbreak: a qualitative study of international health care workers	No lessons learned
Greenberg, A. et al. (2019) “I knew I could make a difference”: motivations and barriers to engagement in fighting the West African Ebola outbreak among U.S.-based health professionals	Outside of scope
Grünewald, F. (2015) Ebola : comment le virus est sorti de la clairière	Factual article, no lessons learned
Heymann, D.L. (1999) Ebola haemorrhagic fever: lessons from Kikwit, Democratic Republic of the Congo	Outside of scope
Heymann, D.L. et al. (2015) Global health security: the wider lessons from the west African Ebola virus disease epidemic.	No lessons learned on humanitarian response
Hillier, D. (2015) Improving international governance for global health emergencies: Lessons from the Ebola crisis	No lessons learned

Horton, R. (2019) Offline: the mistakes we made over Ebola	No lessons learned
Hsiao, A. et al. (2017) Lessons learnt from 12 oral cholera vaccine campaigns in resource-poor settings	Outside of scope
Hussain, H.Y. and Yusuf, A. (2018) Containment strategies and lessons learned from AWD/cholera 2017 epidemic, the experience of Somaliland	No lessons learned on humanitarian response
IDS (2015) Ebola and lessons for development	Outside of scope
IFRC (2018) Communities as agents of change: five things we've learned from the Ebola response	Outside of scope
IFRC (2019) Ebola in Uganda: five things we've learned	Outside of scope
Ivers, L. and Walton, D. (2012) The "first" case of cholera in Haiti: lessons for global health	Outside of scope
Iyengar, P. et al. (2015) Services for mothers and newborns during the Ebola outbreak in Liberia: the need for improvement in emergencies	No lessons learned
Joshi, A. (2014) Ebola outbreak: lessons learnt and future challenges	No lessons learnt
Kalra, S. et al. (2014) The emergence of Ebola as a global health security threat: from 'lessons learned' to coordinated multilateral containment efforts	No lessons learned on humanitarian response
Keylock, J. (2014) Mid-term independent evaluation of ACF's reinforcing institutional capacity for treatment of acute malnutrition, prevention of malnutrition in Freetown Peninsula, Western area and national sensitisation for nutrition security in Sierra Leone	No lessons learned specific to Ebola
Khan, A. et al. (2019) Post-vaccination campaign coverage evaluation of oral cholera vaccine, oral polio vaccine and measles-rubella vaccine among forcibly displaced Myanmar nationals in Bangladesh	Cholera
Kiarie, C. and Amir, M. (2014) Gendering the Ebola outbreak: connecting the missing dots	Outside of scope
Kruk, M. et al. (2015) What is a resilient health system? Lessons from Ebola	No lessons learnt
Lam, E. et al. (2017) Oral cholera vaccine coverage during an outbreak and humanitarian crisis, Iraq, 2015	Cholera
Lamb, D. et al. (2018) Factors affecting the delivery of healthcare on a humanitarian operation in West Africa: a qualitative study	No lessons learned
Largent, E. (2016) Ebola and FDA: reviewing the response to the 2014 outbreak, to find lessons for the future	Outside of scope
Lau, L. et al. (2020) COVID-19 in humanitarian settings and lessons learned from past epidemics	No lessons learned specific to the Ebola response
Leach, M. (2014) Ebola and beyond: equality, sustainability, security – interlaced challenges in a global development era	No lessons learnt
Leach, M. (2015) The Ebola crisis and post-2015 development	Outside of scope
Levine, A. (2018) What we know about fighting Ebola	No lessons learned
Lind, J. (2015) Return of the rebel: legacies of war and reconstruction in	Outside of scope, no lessons learned & reflecting the personal views of the author
West Africa's Ebola epidemic	Outside of scope

Liverpool School of Tropical Medicine (2016) Review of R2HC-funded Ebola research projects	No lessons learned, description of other research papers
Marshall, T. (2019) When treating Ebola, always have water at the ready	Outside of scope
Martineau, F. (2016) People-centred health systems: building more resilient health systems in the wake of the Ebola crisis	No lessons learned
McMahon, S. et al. (2016) Healthcare providers on the frontlines: a qualitative investigation of the social and emotional impact of delivering health services during Sierra Leone's Ebola epidemic	Outside of scope
McPake, B. et al. (2015) Ebola in the context of conflict affected states and health systems: case studies of Northern Uganda and Sierra Leone	Outside of scope
Médecins du Monde (n.d.) Lucia, un parcours inspirant	Outside of scope
Menon, S. (2019) More than a disease: migration, militia and money in the Ebola response	No lessons learned on the humanitarian response
Mo, A. and Hutton, K. (2016) Evaluation of the DFID Ebola Emergency Response Fund (DEERF) in Sierra Leone	No lessons learned specific to Ebola and generalisable, only recommendations for DEERF
Moszynski, P. (2012) Haiti's cholera outbreak provides important lessons for global health	Cholera
MSF (2015) Pushed to the limit and beyond: a year into the largest ever Ebola outbreak	No lessons learned
MSF (2017) Five lessons learned during the latest Ebola outbreak in DRC	Blog post
Nickerson, J.W. et al. (2015) Assessments of health services availability in humanitarian emergencies: a review of assessments in Haiti and Sudan using a health systems approach	Outside of scope
Nohrstedt, D. and Baekkeskov, E. (2018) Political drivers of epidemic response: foreign healthcare workers and the 2014 Ebola outbreak	Outside of scope
Ntumba, H. (2019) Ebola response and community engagement: how to build a bridge?	No lessons learned
Okware, S. et al. (2015) Managing Ebola from rural to urban slum settings: experiences from Uganda	Outside of scope (Ebola outbreaks in Uganda in the 2000s)
Oxfam (2014) Evaluation of Oxfam's Humanitarian Response in Chad	Not relevant
Pasetto, D. et al. (2018) Near real-time forecasting for cholera decision making in Haiti after Hurricane Matthew	Outside of scope
Peprah, D. (2017) "NGOs, they cannot kill people": cholera vaccination in the context of humanitarian crises in South Sudan	Same lessons as Peprah et al. (2016) Perceptions of oral cholera vaccine and reasons for full, partial and non-acceptance during a humanitarian crisis in South Sudan
Peprah, D. et al. (2016) Perceptions of oral cholera vaccine and reasons for full, partial and non-acceptance during a humanitarian crisis in South Sudan	Cholera
Petherick, A. (2015) Ebola: learning the lessons	Outside of scope
Piot, P. et al. (2014) Ebola in West Africa: from disease outbreak to humanitarian crisis	Outside of scope, no lessons learned
Porta, M. et al. (2014) Feasibility of a preventive mass vaccination campaign with two doses of oral cholera vaccine during a humanitarian emergency in South Sudan	Cholera

Quaglio, G. et al. (2015) Ebola: lessons learned and future challenges for Europe	No lessons learned on humanitarian response (only EU)
Rahmoni, E. (2018) Ebola in the DRC: between operational trial and error and scientific uncertainty	Outside of scope
Raka, L. and Guardo, M. (2015) Ebola in West Africa	No lessons learned
Rana, R. and Condor, J. (2011) Evaluation of the International Organization for Migration's ongoing activities on support to the flash appeal for the Haiti Earthquake and Cholera Outbreak (Sida/IOM Agreement January 2010 – May 2011)	Cholera
Rancourt, N. (2013) Gender and vulnerability to Cholera in Sierra Leone	Cholera
Roache, S. (2014) Lessons from the West African epidemic	No lessons learned
Rose-Wood, A. et al. (2014) Development and use of a master health facility list: Haiti's experience during the 2010 earthquake response	Cholera
Ross, E. (2017) Command and control of Sierra Leone's Ebola outbreak response: evolution of the response architecture	No lessons learned for the humanitarian community
Rull, M. and al. (2018) The new WHO decision-making framework on vaccine use in acute humanitarian emergencies: MSF experience in Minkaman, South Sudan	Outside of scope
Schopper, D. et al. (2017) Research ethics governance in times of Ebola	Outside of scope
Schwartz, D. (2020) Being pregnant during the Kivu Ebola Virus Outbreak in DR Congo: The rVSV-ZEBOV vaccine and its accessibility by mothers and infants during humanitarian crises and in conflict areas	No lessons learned (only contextual information)
Shen, X. (2019) The imminent threat of tropical viruses: lessons from the 2014 Ebola outbreak in Africa	No lessons learned specific to the Ebola response
Sijbrandij, M. et al. (2020) The effect of psychological first aid training on knowledge and understanding about psychosocial support principles: a cluster-randomized controlled trial	No lessons learned specific to the Ebola response
Silva, D. and Smith, M. (2015) Limiting rights and freedoms in the context of Ebola and other public health emergencies: how the principle of reciprocity can enrich the application of the Siracusa principles	No lessons learned (only theoretical argumentation)
Singh, J.A. (2015) Humanitarian access to unapproved interventions in public health emergencies of international concern	Outside of scope
Snyder, R. et al. (2014) Ebola in urban slums: the elephant in the room	No specific lessons learned for humanitarians
Solidarités International (2019) L'importance des services d'eau potable, d'assainissement et d'hygiène dans la lutte contre l'épidémie de maladie à virus Ebola en cours en RDC depuis 2018	No lessons learned (only guidelines)
Spiegel, P. et al. (2019) Responding to epidemics in large-scale humanitarian crises: a case study of the cholera response in Yemen, 2016– 2018	Cholera
Sweet, R. (2019) Politics, factions and violence: listening to local voices on Ebola. Local Media Update 3 (February–April 2019)	No lessons learned (only contextual information)
Tambo, E. (2014) Non-conventional humanitarian interventions on Ebola outbreak crisis in West Africa: health, ethics and legal implications	No lessons learned
Taylor, D.L. et al. (2015) The impact of water, sanitation and hygiene interventions to control cholera: a systematic review	Outside of scope
Tomori, O. (2015) Will Africa's future epidemic ride on forgotten lessons from the Ebola epidemic?	No lessons learned

UNICEF (2015) Ebola: Getting to zero – for communities, for children, for the future	No lessons learned
USAID (2019) Moving from Ebola recovery to self-reliance: USAID's impact in Guinea, Liberia, and Sierra Leone	No lessons learned (only summary of long-term impact of USAID-funded programmes)
Watlerts, W. (2015) Lessons learned from Ebola as guide posts for further preparation	No lessons learned
Wenham, C. (2016) Ebola responsibility: moving from shared to multiple responsibilities	Outside of scope
West, K. and al. (2018) Review of MSF-OCA surveillance and alert response in Freetown during the Ebola outbreak: lessons learned and challenges	No lessons learned
WHO (2015) WHO leadership statement on the Ebola response and WHO reforms	Outside of scope
WHO (2016) Case definition recommendations for Ebola or Marburg Virus Diseases	No lessons learned
WHO (2016) El Niño and health	Outside of scope
WHO (2019) Marginalised and mistrustful: listening to people who have few reasons to trust outsiders	Outside of scope
YCI (2016) Ebola Emergency Response (summary)	Summary of an included report

3.4 Data extraction matrix

Once irrelevant studies had been excluded, the reviewers coded studies that met the criteria for inclusion using the following coding sheet. The team manually entered data into Microsoft Excel to facilitate comparison and analysis. Reviewers inserted short quotes to illustrate important points.

Code	Answer	Comments
Citation of the study		
Region		
Domain of the study	Academia; Grey literature	
Type of study	Journal article; Research report; Evaluation report Conference paper; Book/chapter; Thesis/dissertation; M&E report	
Research question		
Linked studies		
Context codes		
Where was the intervention conducted?	State country:	
Which epidemic was the intervention responding to?	Ebola Cholera	
What was the scale of the epidemics?		

Was the epidemic officially recognised by the government?		Yes No	
Was the epidemic recognised by WHO and other humanitarian actors?			
Population codes			
How many people were targeted by the epidemic response activity?			
Status		Refugee Internally displaced person Host communities Local communities	
How many crisis-affected people were impacted indirectly by the epidemic response activities?			
Other risk factors			
Intervention codes			
What was the sector of the intervention?		Health Food security WASH Livelihood	
		Intervention aiming at covering multiple needs	
Who initiated the intervention?		NGOs UN agencies Red Cross/ Red Crescent movement Private sector actors Government actors	
What activities were implemented?			
Outcome codes			
Which outcomes were targeted as regard to the crisis-affected population?		<ul style="list-style-type: none"> Improved health conditions Increased food security Restored livelihoods Improved access to water, sanitation or hygiene Other outcomes 	Improved health conditions
What outcome indicators were used?	And how were they measured?	<ul style="list-style-type: none"> Sector specific indicator (e.g. food consumption score) Proxy indicator Coping strategy index Other 	<ul style="list-style-type: none"> Household survey Key informant interview Focus group discussion Desk review Other
When were the outcomes measured?		Pre-test:	
		Post-test:	

Findings		
What findings do they report?		
Epidemic intervention effectively improved the situation of crisis-affected population		
Epidemic intervention had no impact on the situation of crisis-affected population	Coping strategy index	
Epidemic intervention had a negative impact on crisis-affected population (describe)		
Were the activities feasible?	Yes ('but' if applicable) No ('because')	
	Lack of access Lack of community acceptance Lack of political acceptance Donor reluctance	
How have the epidemic response activities been received?	By the affected population: Positive Negative Mixed No information	
Describe the situation after the intervention		
Lessons learned		
Lessons learned on response	<ul style="list-style-type: none"> ▪ Prevention ▪ Surveillance and detection ▪ Containment ▪ Control and mitigation ▪ Elimination ▪ Gender ▪ WASH ▪ Livelihood/economic recovery ▪ Infrastructure ▪ Community inclusion ▪ Local health centres ▪ International community ▪ Donors and funding ▪ Communication ▪ Others 	

3.5 Quality appraisal tool

The quality of each included document was then assessed using a critical appraisal tool (see Table 8), which was based on Langer et al. (2014). It used five criteria:

- study design
- sampling strategy and/or risk of bias
- rigour of the methodology/study process
- findings' credibility
- contextualisation and generalisation of the study findings

The reviewers measured the achievement and attributed a score per indicator. A score of 0 was attributed if the indicator was not met, a score of 2 if the indicator was met, and a score of 1 if the indicator was partly met. At the end of the process, each of the documents shortlisted had a quality score (as a percentage).

To minimise the risk of personal bias, both the research analyst and the epidemiologist independently implemented the critical appraisal tool for 5% of the studies included (four studies each). They then shared, discussed and agreed the assessment of the document against each of the criteria to determine an overall quality score. Despite a few minor differences, both reviewers came up with similar results, suggesting that the criteria used were sufficiently clear and non-ambiguous for objective quality appraisal.

Although several documents included only limited detail on the study's design, the decision was taken to retain all but one of the studies. In particular, most of the lessons papers included barely had a methodology section or discussed any element of study design. Nonetheless, considering that they displayed interesting and credible lessons learnt based on a wide variety of sources, the team decided to include them, despite their low score on the quality appraisal tool.

Table 8: Quality appraisal tool

Study type: Qualitative			
Methodological appraisal criteria	Score	Comment/confidence judgement	
1. Study is defensible in design			
Consider whether:			
▪ there is a discussion of the rationale for the study design			
▪ the research question is clear and suited to qualitative inquiry			
▪ there are convincing arguments for different features of the study design			
▪ limitations of the research design and implications for the research evidence are discussed			
	Total score	Worth continuing?	

2. Study features an appropriate sample			
Consider whether:			
▪ there is a description of study location and how/why it was chosen			
▪ the author has explained how the participants were selected			
▪ the selected participants were appropriate to collect rich and relevant data			
▪ reasons are given why potential participants chose not take part in study			
	Total score	Worth continuing?	
3. Study is rigorous in conduct			
Consider whether:			
▪ author provides a clear account/description of the process by which data was collected (e.g. for interview method, is there an indication of how interviews were conducted? What procedures were used to collect or record data?)			
▪ author demonstrates that data collection targeted depth, detail and richness of information (e.g. interview/observation schedule)			
▪ there is evidence of how descriptive analytical categories, classes, labels, etc. have been generated and used			
▪ presentation of data distinguishes clearly between the data, the analytical frame used, and the interpretation			
▪ if methods were modified during the study, author has explained how and why			
	Total score	Worth continuing?	
4. Study findings are credible in claim/based on data			
Consider whether:			
▪ there is a clear description of the form of the original data			
▪ a sufficient amount of data is presented to support interpretations and findings/conclusions			
▪ author explains how the data presented was selected from the original sample to feed into the analysis process			
▪ there is a clear and transparent link between data, interpretation and findings/conclusions			
▪ there is evidence of (attempts to give) attention to negative cases/outliers etc.			
	Total score	If findings not credible, can data still be used?	

5. Study attends to contexts			
Consider whether:			
<ul style="list-style-type: none"> there is an adequate description of the contexts of data sources and how they are retained and portrayed 			
<ul style="list-style-type: none"> participants' perspectives/observations are placed in personal contexts 			
<ul style="list-style-type: none"> appropriate consideration is given to how findings relate to the contexts (how findings influence or are influenced by the context) 			
<ul style="list-style-type: none"> the study makes any claims (implicit or explicit) that infer generalisation (if yes, comment on appropriateness) 			
	Total score		
6. Study is reflexive			
Consider whether:			
<ul style="list-style-type: none"> appropriate consideration is given to how findings relate to author's influence/own role during analysis and selection of data for presentation 			
<ul style="list-style-type: none"> author has attempted to validate the credibility of findings (e.g. triangulation, respondent validation, more than one analyst) 			
	Total score		NB: Can override previous exclusion!
OVERALL DECISION: EXCLUDE / INCLUDE			
(study generates new knowledge relevant to the review question and complies with minimum criteria to ensure reliability and empirical grounding of knowledge)			

Study type: Quantitative			
Methodological appraisal criteria	Score	Comment / risk of bias judgement	
1. Selection bias			
Consider whether:			
<ul style="list-style-type: none"> there is a clear description of how and why sample was chosen 			
<ul style="list-style-type: none"> there is adequate sample size to allow for representative and/or statistically significant conclusions 			
<ul style="list-style-type: none"> participants recruited in the control group were sampled from the same population as that of the treatment 			
<ul style="list-style-type: none"> group allocation process attempted to control for potential risk of bias 			
	Total score	Worth continuing?	

2. Bias due to missing data			
Consider whether:			
<ul style="list-style-type: none"> outcome data are reasonably complete (80% or above) 			
<ul style="list-style-type: none"> if 'no', missing data are reported 			
<ul style="list-style-type: none"> if data missing, proportion of participants and reasons for missing data are similar across groups 			
<ul style="list-style-type: none"> if data missing, appropriate statistical methods (e.g. sensitivity analysis) were used to account for missing data 			
<ul style="list-style-type: none"> if not possible to control for missing data, outcomes with missing data are excluded from analysis 			
	Total score		Worth continuing?
3. Outcome reporting bias			
Consider whether:			
<ul style="list-style-type: none"> the outcome measure was clearly defined and objective 			
<ul style="list-style-type: none"> outcomes were assessed using standardised instruments and indicators 			
<ul style="list-style-type: none"> outcome measurements reflect what the experiment set out to measure 			
<ul style="list-style-type: none"> the methods of outcome assessment were comparable across experiential groups 			
	Total score		Worth continuing?
OVERALL RISK OF BIAS			
Study type: Mixed method			
Methodological appraisal criteria	Score	Comment/confidence judgement	
1. Research integration/synthesis of methods			
Consider whether:			
<ul style="list-style-type: none"> the rationale for integrating qualitative and quantitative methods to answer the research question is explained 			
<ul style="list-style-type: none"> the mixed-methods research design is relevant to address the qualitative and quantitative research questions, or the qualitative and quantitative aspects of the mixed methods research question 			
<ul style="list-style-type: none"> there is evidence that data gathered by both research methods was brought together to inform new findings to answer the mixed-methods research question (e.g. form a complete picture, synthesise findings, configuration) 			

<ul style="list-style-type: none"> the approach to data integration is transparent and rigorous in considering all findings from both the qualitative and quantitative module (danger of cherry-picking) 		
<ul style="list-style-type: none"> appropriate consideration is given to the limitations associated with this integration (e.g. the divergence of qualitative and quantitative data or results) 		
<p>For mixed methods research studies, each component undergoes its individual critical appraisal first. Since qualitative studies are either included or excluded, no combined risk of bias assessment is facilitated and the assigned risk of bias from the quantitative component similarly holds for the mixed-methods research.</p> <p>The listed appraisal indicators only refer to the applied mixed-methods design. If this design is not found to comply with each of the following four mixed-methods appraisal criteria, then the quantitative/qualitative components will individually be included in the review.</p>		
<p>Mixed methods critical appraisal:</p> <ol style="list-style-type: none"> Study is defensible in design Study is rigorous in conduct Study is credible in claim Study is reflective 	<p>Qualitative critical appraisal:</p> <ul style="list-style-type: none"> Include / Exclude 	<p>Quantitative critical appraisal:</p> <ol style="list-style-type: none"> Low risk of bias Risk of bias High risk of bias Critical risk of bias
<p>Combined appraisal:</p> <p>Include / Exclude mixed methods findings judged with _____ risk of bias.</p>		

*Scoring matrix: 0 = No; 1 = Partly; 2 = Yes

3.6 Data synthesis table

This table details which papers are cited in which lessons and the confidence scoring of each lesson.

Table 9: Papers per lesson

#	Lesson	Papers	Score	Average score
1	Health workers	Abramowitz, S. (2016) Ebola community care centers: lessons learned from UNICEF's 2014–2015 experience in Sierra Leone	91	38.94
		Adams, V. (2016) OCB Ebola review	46	
		Ayoo, S. et al. (2016) Evaluation of IFRC West Africa Ebola Viral Disease Appeal Response: Sierra Leone and Liberia	24	
		IFRC (2016) Beyond Ebola: from dignified response to dignified recovery	0	
		IRC (2016) The Ebola lessons reader	42	
		IRC (2016) Ebola's psychosocial toll on frontline health workers: research brief 2016	26	
		Médecins Sans Frontières (2016) MSF supported research on Ebola	12	
		Morlai, T. (2017) Protecting the living, honouring the dead: the barriers and enablers to community acceptance and implementation of safe burials	85	
		YMCA (2016) Sierra Leone YMCA Ebola outbreak response	56	
		WHO (2015) Ebola response: what needs to happen in 2015	0	

		Piot, P. et al. (2019) Emergent threats: lessons learnt from Ebola	0	
		Herrick, C. and Brooks, A. (2020) Global health volunteering, the Ebola outbreak, and instrumental humanitarianisms in Sierra Leone	45	
		Grünwald, F. (2015) Ebola: the cost of poor global humanitarian governance in health	83	
		Grünwald, F. and Maury, H. (2020) Epidemics, pandemics and humanitarian challenges: lessons from a number of health crises	30	
		Haggman, H. et al. (2016) Occupational health for humanitarian aid workers in an Ebola outbreak	83	
		Ripoll, S. et al (2018) Social science lessons learned from Ebola epidemics	0	
2	WASH	ACAPS (2015) WASH in Guinea, Liberia, and Sierra Leone: the impact of Ebola	0	34.22
		Campbell, L. (2017) Learning from the Ebola response in cities: responding in the context of urban quarantine	0	
		ACAPS (2016) Beyond a public health emergency: potential secondary humanitarian impacts of a large-scale Ebola outbreak	16	
		Campbell, L. (2017) Ebola response in cities: learning for future public health crises	25	
		Czerniewska, A. and White, S. (2020) Hygiene programming during outbreaks: a qualitative case study of the humanitarian response during the Ebola outbreak in Liberia	85	
		Grünwald, F. and Maury, H. (2020) Epidemics, pandemics and humanitarian challenges: lessons from a number of health crises	30	
		Mobula, L. et al. (2020) Recommendations for the COVID-19 response at the national level based on lessons learned from the Ebola Virus Disease outbreak in the Democratic Republic of the Congo	0	
		Schofield, R. (2016) DEC funded Ebola response programme in Sierra Leone	74	
		Yates, T. et al. (2017) Evidence synthesis: WASH interventions in disease outbreak response	78	
3	Burials	Ripoll, S. et al (2018) Social science lessons learned from Ebola epidemics	0	34.56
		Park, C. (2020) Traditional funeral and burial rituals and Ebola outbreaks in West Africa: A narrative review of causes and strategy interventions	68	
		Morlai, T. (2017) Protecting the living, honouring the dead: the barriers and enablers to community acceptance and implementation of safe burials	85	
		Kasali, N. (2019) Community responses to the Ebola response: Beni, North Kivu	26	
		Grünwald, F. and Maury, H. (2020) Epidemics, pandemics and humanitarian challenges: lessons from a number of health crises	30	
		Cordner, C. et al (2017) The Ebola epidemic in Liberia and managing the dead: a future role for Humanitarian Forensic Action?	0	
		Bedford, J. (2018) Key considerations: burial, funeral and mourning practices in Équateur Province, DRC	28	
		Baggio, O. et al. (2019) Bringing community perspectives to decision-making in the Ebola response in the Democratic Republic of Congo	0	
		Alcayna-Stevens, L. (2018) Planning for post-Ebola: lessons learned from DR Congo's 9th epidemic	74	

4	Surveillance	Adams, J. et al. (2015) The Oxfam Ebola response in Liberia and Sierra Leone	45	30,33
		Alcayna-Stevens, L. (2018) Planning for post-Ebola: lessons learned from DR Congo's 9th epidemic	74	
		Campbell, L. (2017) Learning from the Ebola response in cities: population movement	0	
		Murray, A. et al. (2015) Report of the real-time evaluation of the Ebola control programs in Guinea, Sierra Leone and Liberia	63	
		Ripoll, S. et al. (2018) Social Science Lessons learned from Ebola epidemics	0	
		Thomson, S. and Bolton, L. (2014) Helpdesk report: Ebola regional lesson learning	0	
5	Communication	Abramowitz, S. (2016) Ebola community care centers: lessons learned from UNICEF's 2014-2015 experience in Sierra Leone	91	45.04
		ACAPS (2015) Ebola outbreak, Sierra Leone: communication – challenges and good practices	35	
		ACAPS (2016) Beyond a public health emergency: potential secondary humanitarian impacts of a large-scale Ebola outbreak	16	
		Bedford, J. (2018) Key considerations: health-seeking behaviours in Equateur Province, DRC	26	
		Campbell, L. (2017) Ebola response in cities: learning for future public health crises	25	
		Carter, S.E. et al. (2017) Barriers and enablers to treatment-seeking behavior and causes of high-risk practices in Ebola: a case study from Sierra Leone	67	
		Czerniewska, A. and White, S. (2020) Hygiene programming during outbreaks: a qualitative case study of the humanitarian response during the Ebola outbreak in Liberia	85	
		DuBois, M. and Wake, C. with Sturridge, S. and Bennett, C. (2015) The Ebola response in West Africa: exposing the politics and culture of international aid	52	
		Featherstone, A. (2015) Keeping the faith: the role of faith leaders in the Ebola response	70	
		Fink-Hooijer, F. et al. (2015) The Ebola crisis in West Africa	0	
		Gray, N. et al. (2018) 'When Ebola enters a home, a family, a community': a qualitative study of population perspectives on Ebola control measures in rural and urban areas of Sierra Leone	80	
		Kodish, S.R. et al. (2019) Implications of the Ebola virus disease outbreak in Guinea: qualitative findings to inform future health and nutrition-related responses	76	
		Laverack, G. and Manoncourt, E. (2016) Key experiences of community engagement and social mobilization in the Ebola response	26	
		Niedberger, E. et al. (2016) Guide to community engagement in WASH: A practitioner's guide, based on lessons from Ebola	33	
		Peyton, D. et al. (2019) Key considerations: Ebola preparedness and readiness in Goma, DRC	35	
		Ripoll, S. et al. (2018) Social science lessons learned from Ebola epidemics	0	
		Smith, M.J. and Upshur, R.E.G. (2015) Ebola and learning lessons from moral failures: who cares about ethics?	39	
		Sustersic, L. (2015) Ebola response system strengthening along Western Area Peninsula Coastline	24	
		Translators Without Borders (2017) Words of relief: Ebola crisis learning review	0	

		Translators Without Borders (2019) We need to talk: an assessment of changing communication needs and preferences in Beni, North Kivu	76	
		Vinck, P. et al. (2019) Institutional trust and misinformation in the response to the 2018–19 Ebola outbreak in North Kivu, DR Congo: a population-based survey	100	
		YMCA (2016) Sierra Leone YMCA Ebola outbreak response	54	
		ACAPS (2015) Ebola outbreak, Liberia: communication – challenges and good practices	26	
6	Community ownership	ACAPS (2015) Ebola in West Africa: challenges to the reintegration of affected groups into communities	0	32.09
		Ayoo, S. et al. (2016) Evaluation of IFRC West Africa Ebola Viral Disease Appeal Response: Sierra Leone and Liberia	24	
		Baggio, O. et al. (2019) Bringing community perspectives to decision-making in the Ebola response in the Democratic Republic of Congo	0	
		Batilo Momoh, H. et al. (2016) Evaluation of DEC Ebola Response Programme Phases 1 & 2	73	
		Featherstone, A. (2015) Keeping the faith: the role of faith leaders in the Ebola response	70	
		House of Commons (2016) Ebola: responses to a public health emergency	0	
		Kasali, N. (2019) Community responses to the Ebola response: Beni, North Kivu	26	
		Laverack, G. and Manoncourt, E. (2016) Key experiences of community engagement and social mobilization in the Ebola response	26	
		Médecins Sans Frontières (2020) After the fire: how we could have better managed DRC Ebola outbreak	0	
		Niedberger, E. et al. (2016) Guide to community engagement in WASH: a practitioner's guide, based on lessons from Ebola	33	
		O'Callaghan, S. (2020) Can we apply lessons learned from Ebola experience in West Africa for COVID-19 in lower-income countries?	0	
		Piot, P. et al. (2019) Emergent threats: lessons learnt from Ebola	0	
		Polygea (2016) Lessons learned from Ebola-affected communities	65	
		Pronyk, P. et al. (2016) The effect of community-based prevention and care on Ebola transmission in Sierra Leone	86	
		Quinn, M. (2016) Governance and health in post-conflict countries: the Ebola outbreak in Liberia and Sierra Leone	0	
		Ryan, M. et al. (2019) Technologies of trust in epidemic response: openness, reflexivity and accountability during the 2014–2016 Ebola outbreak in West Africa	74	
		The Ebola Research Group (2019) Responding to the Ebola virus disease outbreak in DR Congo: when will we learn from Sierra Leone?	0	
		UNICEF (2016) Evaluation of UNICEF's response to the Ebola outbreak in West Africa 2014–2015	56	
		Wilkinson, A. and Leach, M. (2015) Briefing: Ebola myths, realities, and structural violence	0	
		Abramowitz, S. (2015) community-centered responses to Ebola in urban Liberia: the view from below	80	
		Fearon, C. (2015) Humanitarian quality assurance: Sierra Leone – evaluation of Oxfam's humanitarian response to the West Africa Ebola crisis	58	

		Carter, S.E. et al. (2017) Barriers and enablers to treatment-seeking behavior and causes of high-risk practices in Ebola: a case study from Sierra Leone	67	
		Dean, C. and Hawrylyshyn, K. (2015) Engaging young people in the Ebola response	0	
7	No one-size-fits-all	Duda, R. et al. (2018) Key Considerations: engaging Twa communities in Équateur Province	28	33.67
		Niedberger, E. et al. (2016) Guide to community engagement in WASH: a practitioner's guide, based on lessons from Ebola	33	
		Wilkinson, A. et al. (2017) Engaging 'communities': anthropological insights from the West African Ebola epidemic	0	
		Ripoll, S. et al. (2018) Social science lessons learned from Ebola epidemics	0	
		Alcayna-Stevens, L. (2018) Planning for post-Ebola: lessons learned from DR Congo's 9th epidemic	74	
		Carter, S.E. et al. (2017) Barriers and enablers to treatment-seeking behavior and causes of high-risk practices in Ebola: a case study from Sierra Leone	67	
8	Context and determinants	ACAPS (2015) Ebola in West Africa: Guinea – resistance to the Ebola response	55	38.80
		Baggio, O. et al. (2019) Bringing community perspectives to decision-making in the Ebola response in the Democratic Republic of Congo	0	
		Campbell, L. (2017) Ebola response in cities: learning for future public health crises	25	
		Duda, R. et al. (2018) Key considerations: engaging Twa communities in Équateur Province	28	
		Kasali, N. (2019) Community responses to the Ebola response: Beni, North Kivu	26	
		Kraemer, M. et al. (2020) Dynamics of conflict during the Ebola outbreak in the Democratic Republic of the Congo 2018–2019	100	
		Masumbuko, C.K. et al. (2019) Social resistance drives persistent transmission of Ebola virus disease in Eastern Democratic Republic of Congo: a mixed-methods study	79	
		Mukpo, A. (2015) Surviving Ebola: Public perceptions of governance and the outbreak response in Liberia	61	
		Rohan, H. and McKay, G. (2020) The Ebola outbreak in the Democratic Republic of the Congo: why there is no 'silver bullet'	0	
		Sweet, R. and Bedford, J. (2018) WhatsApp and local media (Grand Nord): reluctance, refusal, resistance and the politicisation of the Ebola response	26	
		Vinck, P. et al. (2019) Institutional trust and misinformation in the response to the 2018–19 Ebola outbreak in North Kivu, DR Congo: a population-based survey	100	
		Wells, C.R. et al. (2019) The exacerbation of Ebola outbreaks by conflict in the Democratic Republic of the Congo	55	
		Lee, T.-S. (2016) Making International health regulations work: lessons from the 2014 Ebola Outbreak	26	
		Abramowitz, S. (2017) The opposite of denial: social learning at the onset of the Ebola emergency in Liberia	48	
		Bedford, J. (2018) Key considerations: health-seeking behaviours in Equateur Province, DRC	26	
		Czerniewska, A. and White, S. (2020) Hygiene programming during outbreaks: a qualitative case study of the humanitarian response during the Ebola outbreak in Liberia	85	

		Onoma, A. (2016) Rites of mobility and epidemic control: Ebola Virus Disease in the Mano River Basin	0	
		Peyton, D. et al. (2019) Key considerations: Ebola preparedness and readiness in Goma, DRC	35	
		Wilkinson, A. and Leach, M. (2015) Briefing: Ebola myths, realities, and structural violence	0	
		The Ebola Research Group (2019) Responding to the Ebola Virus Disease outbreak in DR Congo: when will we learn from Sierra Leone?	0	
9	Gender	United Nations, World Bank, European Union and African Development Bank (2015) Recovering from the Ebola crisis	35	54.08
		Steven, H. et al. (2018) Evaluation of USAID/OFDA EVD outbreak response	85	
		Sheperd, M. et al. (2017) An evaluation of WFP's L3 response to the Ebola Virus Disease (EVD) crisis in West Africa (2014– 2015)	59	
		Park, C. (2020) Traditional funeral and burial rituals and Ebola outbreaks in West Africa: a narrative review of causes and strategy interventions	68	
		Morlai, T. (2017) Protecting the living, honouring the dead: the barriers and enablers to community acceptance and implementation of safe burials	85	
		Harman, S. (2016) Ebola, gender, and conspicuously invisible women in global health governance	38	
		Diggins and Mills (2015) The Pathology of inequality: gender and Ebola in West Africa	0	
		Carter, S.E. et al. (2017) Mainstreaming gender in WASH: lessons learned from Oxfam's experience of Ebola	30	
		Bedford, J. (2018) Key considerations: health-seeking behaviours in Equateur Province, DRC	26	
		Batilo Momoh, H. et al. (2016) Evaluation of DEC Ebola Response Programme Phases 1 & 2	73	
		Androsik, A. (2020) Gendered understanding of Ebola crisis in Sierra Leone: lessons for COVID-19	65	
		Alcayna-Stevens, L. (2018) Planning for post-Ebola: lessons learned from DR Congo's 9th epidemic	74	
		Minor, O. (2017) Ebola and accusation: gender and stigma in Sierra Leone's Ebola Response	65	
10	Coercion	Minor, O. (2017) Ebola and accusation: gender and stigma in Sierra Leone's Ebola response	65	23,13
		Oosterhoff, P. (2015) Local engagement in Ebola outbreaks and beyond in Sierra Leone	0	
		Davies, S. and Rushton, S. (2016) Public health emergencies: a new peacekeeping mission? Insights from UNMIL's role in the Liberia Ebola outbreak	22	
		Grünewald, F. and Maury, H. (2020) Epidemics, pandemics and humanitarian challenges: lessons from a number of health crises	30	
		International Rescue Committee (2016) The Ebola lessons reader	42	
		Campbell, L. (2017) Learning from the Ebola response in cities: responding in the context of urban quarantine	0	
		Laverack, G. and Manoncourt, R. (2016) Key experiences of community engagement and social mobilization in the Ebola response	26	
		Nevin, R. and Anderson, J. (2016) The timeliness of the US military response to the 2014 Ebola disaster: a critical review	0	
11	Quarantine	ACAPS (2016) Beyond a public health emergency: potential secondary humanitarian impacts of a large-scale Ebola outbreak	16	16.10

		Calain, P. and Poncin, M. (2015) Reaching out to Ebola victims: coercion, persuasion or an appeal for self-sacrifice?	0	
		Campbell, L. (2017) Learning from the Ebola response in cities: responding in the context of urban quarantine	0	
		Campbell, L. (2017) Ebola response in cities: learning for future public health crises	25	
		Hoffman, D. (2016) A crouching village: Ebola and the empty gestures of quarantine in Monrovia	0	
		Kutalek, R. et al. (2015) Ebola interventions: listen to communities	46	
		Oxfam (2015) Quarantines in Sierra Leone	0	
		Sustersic, L. (2015) Ebola response system strengthening along Western Area Peninsula Coastline	24	
		Sustersic, L. (2015) Quarantine in Sierra Leone : lessons learned	24	
		Laverack, G. and Manoncourt, E. (2016) Key experiences of community engagement and social mobilization in the Ebola response	26	
12	Healthcare outside of Ebola	Siekman, K. et al. (2017) Community-based health care is an essential component of a resilient health system: evidence from Ebola outbreak in Liberia	41	41.29
		Nagai, M. et al. (2020) Can we apply lessons learned from Ebola experience in West Africa for COVID-19 in lower-income countries?	0	
		McQuilkin, P.A. et al. (2017) Healthcare access during the Ebola virus epidemic in Liberia	100	
		Kutalek, R. et al. (2015) Ebola interventions: listen to communities	46	
		Grünwald, F. and Maury, H. (2020) Epidemics, pandemics and humanitarian challenges: lessons from a number of health crises	30	
		Denney, L. et al. (2015) Teenage pregnancy after Ebola in Sierra Leone: mapping responses, gaps and ongoing challenges	72	
		Ansumana, R. et al. (2017) Impact of infectious disease epidemics on tuberculosis diagnostic, management, and prevention services: experiences and lessons from the 2014–2015 Ebola Virus Disease outbreak in West Africa	0	
13	Survivors	ACAPS (2015) Ebola in West Africa: challenges to the reintegration of affected groups into communities	0	21.50
		Alcayna-Stevens, L. (2018) Planning for post-Ebola: lessons learned from DR Congo's 9th epidemic	74	
		Médecins Sans Frontières (2016) MSF supported research on Ebola	12	
		Cancedda, C. et al. (2016) Strengthening health systems while responding to a health crisis: lessons learned by a nongovernmental organization during the Ebola Virus Disease epidemic in Sierra Leone	0	
14	Psychological effects	ACAPS (2015) Ebola in West Africa: challenges to the reintegration of affected groups into communities	0	37.38
		Alcayna-Stevens, L. (2018) Planning for post-Ebola: lessons learned from DR Congo's 9th epidemic	74	
		Batilo Momoh, H. et al. (2016) Evaluation of DEC Ebola Response Programme Phases 1 & 2	73	
		Hallgarten, J. (2020) Four lessons from evaluations of the education response to Ebola	10	
		Konteh, F. (2017) After the outbreak: analysis of the post-Ebola recovery period of Sierra Leone and Liberia with lessons for future health emergencies	72	
		Kutalek, R. et al. (2015) Ebola interventions: listen to communities	46	

		Mohammed, A. et al. (2015) Mental health in emergency response: lessons from Ebola	0	
		Sustersic, L. (2015) Quarantine in Sierra Leone : lessons learned	24	
15	Protection	ACAPS (2016) Beyond a public health emergency: potential secondary humanitarian impacts of a large-scale Ebola outbreak	0	37.63
		ACAPS (2015) Ebola in West Africa: challenges to the reintegration of affected groups into communities	0	
		Fearon, C. (2015) Humanitarian quality assurance: Sierra Leone – evaluation of Oxfam's humanitarian response to the West Africa Ebola crisis	58	
		Fink-Hooijer, F. et al. (2015) The Ebola crisis in West Africa	0	
		UNICEF (2016) Evaluation of UNICEF's response to the Ebola outbreak in West Africa 2014–2015	56	
		United Nations, World Bank, European Union and African Development Bank (2015) Recovering from the Ebola crisis	35	
		Risso-Gill, I. and Finnegan, L. (2015) Children's Ebola Recovery Assessment Report (CERA): Sierra Leone	80	
		Denney, L. et al. (2015) Teenage pregnancy after Ebola in Sierra Leone: mapping responses, gaps and ongoing challenges	72	
16	Education and economic effects	Murray, A. et al. (2015) Report of the real-time evaluation of the Ebola control programs in Guinea, Sierra Leone and Liberia	63	49,04
		UNICEF (2016) Evaluation of UNICEF's response to the Ebola outbreak in West Africa 2014–2015	56	
		USAID (2019) Building back better: Sierra Leone's journey to self-reliance	0	
		Risso-Gill, I. and Finnegan, L. (2015) Children's Ebola Recovery Assessment Report (CERA): Sierra Leone	80	
		Hallgarten, J. (2020) Four lessons from evaluations of the education response to Ebola	10	
		YMCA (2016) Sierra Leone YMCA Ebola Outbreak Response	56	
		YMCA (2015) Liberia YMCA Ebola Outbreak Response	54	
		Sustersic, L. (2015) Quarantine in Sierra Leone : lessons learned	26	
		Radice, H.W. (2017) Cash Transfers for food security in epidemics: a review of the USAID Food for Peace response to the Ebola crisis in Liberia and Sierra Leone	26	
		Mercy Corps (2014) Economic impact of the Ebola crisis on select Liberian markets	84	
		Konteh, F. (2017) After the outbreak: analysis of the post-Ebola recovery period of Sierra Leone and Liberia with lessons for future health emergencies	72	
		Guluma, Y. (2018) Outcome analysis: cash transfer programming response to the Ebola crisis in Sierra Leone and Liberia	65	
		Grünewald, F. and Maury, H. (2020) Epidemics, pandemics and humanitarian challenges: lessons from a number of health crises	30	
		Platt, A. and Kerley, L. (2016) External evaluation of Plan International UK's response to the Ebola virus outbreak in Sierra Leone	70	
		Dumas, T. et al. (2017) Harnessing digital technology for cash transfer programming in the Ebola response: lessons learned from USAID/Office of Food for Peace partners' West Africa Ebola responses (2015–2016)	63	
		Dumas, T. (2016) Mitigating the impact of the Ebola Virus Disease on the most vulnerable households through an integrated food and nutrition security intervention in the district of Moyamba, Sierra Leone	74	

		Batilo Momoh, H. et al. (2016) Evaluation of DEC Ebola Response Programme Phases 1 & 2	73	
		ACAPS (2015) Ebola in West Africa: challenges to the reintegration of affected groups into communities	0	
		Peyton, D. et al. (2019) Key considerations: Ebola preparedness and readiness in Goma, DRC	35	
		Kodish, S.R. et al. (2019) Implications of the Ebola virus disease outbreak in Guinea: qualitative findings to inform future health and nutrition-related responses	76	
		Kodish, S.R. et al. (2019) A qualitative study to understand how Ebola Virus Disease affected nutrition in Sierra Leone: a food value-chain framework for improving future response strategies	74	
		Rohwerder, B. (2014) Impact and implications of the Ebola crisis	0	
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		Alcayna-Stevens, L. (2018) Planning for post-Ebola: lessons learned from DR Congo's 9th epidemic	74	
17	Coordination	Batilo Momoh, H. et al. (2016) Evaluation of DEC Ebola Response Programme Phases 1 & 2	73	36.11
		Bayntun, C. and Zimbe, S.-A. (2016) Evaluation of the OCG response to the Ebola outbreak: lessons learned from the Freetown Ebola treatment unit, Sierra Leone	52	
		Coltart, C. et al. (2017) The Ebola outbreak 2013–2016: old lessons for new epidemics	25	
		DuBois, M. and Wake, C. with Scarlett Sturridge, S. and Christina Bennett, C. (2015) The Ebola response in West Africa: Exposing the politics and culture of international aid	52	
		Elmahdawy, E. et al. (2017) Ebola virus epidemic in West Africa: global health economic challenges, lessons learned, and policy recommendations	0	
		Fink-Hooijer, F. et al. (2015) The Ebola crisis in West Africa	0	
		Grünwald, F. (2015) Ebola: the cost of poor global humanitarian governance in health	83	
		Grünwald, F. et al. (2017) MCDA deployment in natural disasters and health crises: the Ebola crisis	10	
		International Rescue Committee (2016) The Ebola lessons reader	42	
		Kamradt-Scott, A. (2016) WHO's to blame?	0	
		Lee, T.-S. (2016) Making international health regulations work: lessons from the 2014 Ebola Outbreak	0	
		Mobula, L. et al. (2020) Recommendations for the COVID-19 response at the national level based on lessons learned from the Ebola Virus Disease outbreak in the Democratic Republic of the Congo	0	
		Olu, O. et al. (2016) Incident management systems are essential for effective coordination of large disease outbreaks: perspectives from the coordination of the Ebola outbreak response in Sierra Leone	26	
		Sadaphal (USAID) (2018) Evaluation of the USAID/OFDA EVD outbreak response in West Africa 2014–2016: Objective 1 – Effectiveness of the response	85	
		Smith, M.J. and Upshur, R.E.G (2015) Ebola and learning lessons from moral failures: who cares about ethics?	39	
		Steven, H. et al. (2018) Evaluation of USAID/OFDA EVD outbreak response	85	

		UNICEF (2016) Evaluation of UNICEF's response to the Ebola outbreak in West Africa 2014–2015	56	
		WHO (2015) Report of the Ebola interim assessment panel	0	
		Fearon, C. (2015) Humanitarian quality assurance: Sierra Leone – evaluation of Oxfam's humanitarian response to the West Africa Ebola crisis	58	
18	Funding	DuBois, M. and Wake, C. with Scarlett Sturridge, S. and Christina Bennett, C. (2015) The Ebola response in West Africa: exposing the politics and culture of international aid	52	47.36
		Sadaphal (USAID) (2018) Evaluation of the USAID/OFDA EVD outbreak response in West Africa 2014–2016: Objective 1 – Effectiveness of the response	85	
		Lupel, A. and Snyder, M. (2017) The mission to stop Ebola: lessons for UN crisis response	28	
		Grépin, K. (2015) International donations to the Ebola virus outbreak: too little, too late?	50	
		Cancedda, C. et al. (2016) Strengthening health systems while responding to a health crisis: lessons learned by a nongovernmental organization during the Ebola Virus disease epidemic in Sierra Leone	0	
		Bond (2016) Bond and Ebola Coordination activity report	17	
		International Rescue Committee (2016) The Ebola lessons reader	42	
		Shapiro, I. (2018) Collaborating, learning & adapting case analysis: deep dive – global communities' Ebola response in Liberia	63	
		Cook, G. et al (2018) Evaluation of USAID/OFDA EVD outbreak response	85	
		YMCA (2015) Liberia YMCA Ebola outbreak response	54	
		Adams, J. et al. (2015) The Oxfam Ebola response in Liberia and Sierra Leone	45	

To calculate the confidence scoring, the team first averaged the quality score of each document in each lesson to obtain a raw quality score (out of 100) and then counted the number of documents contributing to each lesson to capture the size of the evidence base. The average quality score for a lesson is 36 out of 100. and the average number of papers cited in each lesson is 12. The consultants also calculated the average score per lesson obtained in the Delphi process (in the second round from the short list of lessons) to add information on the level of adherence to the lesson by experts.

Grading frequency of lessons:

The average number of documents used for the lessons is 12. The authors also used the standard deviation to determine the frequency level of each lesson. The frequency is therefore relative to the other lessons.

VERY LOW FREQUENCY= 4–7



LOW FREQUENCY= 8–11



HIGH FREQUENCY= 12–17



VERY HIGH FREQUENCY= 17–24



Grading quality of lessons:

36/100 is the average score of all 185 documents. 40% of the documents have a low relative quality score; 15% have a medium relative quality score; 16% have a high relative quality score; and 29% have a very high relative quality score. Authors used the standard deviation to determine the relative quality level. The level of relative quality is therefore the quality of a paper relative to the quality of the 185 included papers.

VERY LOW RELATIVE QUALITY= 0–18



MEDIUM RELATIVE QUALITY= 19–36



HIGH RELATIVE QUALITY= 37–64



VERY HIGH RELATIVE QUALITY= 65–100



Ranking of lessons by the Delphi expert group:

Delphi members were asked to rank the priority of each lesson on a scale from 0 to 5. All lessons obtained a priority score between 3.5 and 5. The authors determined the level of priority according to the average ranking of each lesson.

LOW PRIORITY= BELOW 3.50



MEDIUM PRIORITY= BETWEEN 3.51–3.99



HIGH PRIORITY= BETWEEN 4.00–4.49



VERY HIGH PRIORITY= BETWEEN 4.50–5.00



Related ALNAP publications

- Humanitarian response to Ebola and cholera epidemics: a lessons paper
- Lessons Paper: A methods note
- ALNAP Lessons Paper: Responding to earthquakes
- Nepal Earthquake Response: Lessons for operational agencies



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