EVIDENCE-INFORMED DECISION-MAKING IN CRISIS ZONES

SUPPORTING THE USE OF RESEARCH EVIDENCE TO INFORM DECISION-MAKING IN CRISIS ZONES

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Lay abstract

In humanitarian aid, and specifically in crisis zones, there are many different types of information decision-makers can draw from when making decisions. One specific type of information is research evidence; however, the use of research evidence, and the ways it can inform decision-making in crisis zones, has been understudied. This dissertation addresses this key gap in understanding by: 1) developing a new tool that can help decisions-makers use research evidence to inform their decisions in crisis zones within the political, health, humanitarian aid and health research systems; 2) examining the factors that influence the use of research evidence in the governmental health policy-development processes for Syrian refugees in Lebanon and Ontario; and 3) examining the perspectives of decisions-makers around using one way of supporting the use of research evidence — an evidence website — to support evidence-informed decision-making in crisis zones.

Abstract

Many strategies can be used to support the use of research evidence in decision-making. However, such strategies have been understudied in crisis zones, where decision-making may be particularly complex, many factors may influence decision-makers' use of research evidence, and professional judgements may be particularly relied upon. Using synthesis and qualitative research methods, this dissertation examines the role of research evidence in crisis zones and strategies to support its use in decision-making.

First, chapter 2 describes a critical interpretive synthesis, which drew upon a broad body of literature around evidence use in crisis zones to develop a new conceptual framework that outlines strategies that leverage the facilitators and address the barriers to evidence use in crisis zones in four systems, namely the political, health, international humanitarian aid, and health research systems. Second, in chapter 3, the focus narrows, and an embedded qualitative case study design was used to gain a deeper understanding into one of the four identified systems, the political system, and specifically the factors that influenced the use of research evidence in the governmental health policy-development processes for Syrian refugees in Lebanon and Ontario. Finally, in chapter 4, a user testing study design was used to zero-in on decision-makers' experiences with a particular strategy within the health research system, namely an evidence website focused specifically on topics relevant in crisis zones.

This dissertation provides a rich understanding of research evidence use by examining knowledge translation strategies in a setting that has been largely unexplored in the broader KT map: crisis zones. The findings from this thesis point to the need for

comprehensive strategies to support evidence use in decision-making that draw upon the existing literature and are adapted for crisis zones, which can occur sequentially or simultaneously within or across the four identified systems.

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To any student reading my humble thesis, my message to you is simple: believe in yourself, conduct your work with integrity, and always focus your energy on contributing knowledge that will hopefully have an impact on people's lives.

I came to this thinking I knew so much, only to realize that I have so much more to learn. One quote carried me throughout my work: "*I come as one, but I stand as ten thousand*". I stand on the shoulders of those who came before me.

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List of abbreviations

3I+E – Institutions, interests, ideas, and external factors

CIS: critical interpretive synthesis

CRC: Canadian Red Cross

HEW: Humanitarian Evidence Week

HiREB – Hamilton Integrated Research Ethics Board

HRS: Health Response Strategy

K2P: Knowledge to Policy

KT: knowledge translation

LCRP: Lebanon Crisis Response Plan

LHINs: Local Health Integration Networks

LMICs: low- and middle-income countries

NCD: non-communicable disease

MEOC: Ministry Emergency Operations Centre

MOHLTC: Ministry of Health and Long-Term Care

MoPH: Ministry of Public Health

MSF: Médecins Sans Frontières

NEMN: National Emergency Management Network

NHSC: National Health Steering Committee

VASyR: Vulnerability Assessment of Syrian Refugees

Declaration of academic achievement

      This dissertation presents three original scientific contributions (chapters 2-4), along with introductory and concluding chapters (chapters 1 and 5). Each of the chapters in this dissertation is co-authored, and I, Ahmad Firas Khalid, am the lead author for each. Details of specific contributions are provided in the preface to each individual chapter. Overall, I conceived of each chapter with my supervisor, Dr. John N. Lavis, and with inputs from members of my supervisory committee, Dr. Meredith Vanstone and Dr. Fadi El-Jardali. I completed all data collection and analysis for each chapter. Finally, I drafted all chapters, and each co-author provided feedback that was incorporated into subsequent revisions.

Chapter 1. Introduction

This chapter introduces three original research chapters as part of this Ph.D. dissertation. This chapter begins with an overview of humanitarian crises and the current state of literature on research evidence informing decision-making in crisis situations. This chapter presents the overarching aims of this dissertation, specific objectives of each chapter, and summarizes the methodological approaches I plan to use to address each objective. This chapter ends with a discussion on the anticipated substantive, methodological, and theoretical contributions for each chapter that follows.

Humanitarian crises are a global concern, happening more frequently, and growing in scale (1). In the last decade, nearly 1.6 billion people worldwide have been affected by disasters. The estimated total cost of damages caused by disasters around the world is more than $1.3 trillion (2), which includes a record level of spending on humanitarian aid (3). Crises are no longer contained in one geographical location but rather transcend borders, and they can affect mass populations and disrupt health systems. There are several defining characteristics of a crisis situation. First, events that led up to a crisis situation are often unexpected. Second, the crisis event creates uncertainty with what the future holds under this new unexpected event. Third, the crisis event is seen as a threat to the important goals of security and sustainability of a normal structure. Recent humanitarian crises — be it the Ebola epidemic or the Syrian refugee crisis — have placed considerable stress on health systems that are not fully equipped to deal with such crises. For all these reasons, it is important that we start to think how can we build effective humanitarian systems that are able to respond to crises.

Previous studies focusing on the humanitarian aid sector have identified many factors that contribute to its effectiveness, one of which is the use of research evidence to inform decision-making (4-6). What makes decision-making in crisis situations unique is the high levels of stress, often in intense and sometimes dangerous situations. Research evidence can help decision-makers respond in a timely manner in such situations. However, the use of research evidence to help respond to crises is not always straightforward. A culture built on immediate action with a traditionally heavy reliance on professional judgement may not be conducive to using evidence to inform decision-making in crisis zones (7). For example, when faced with an unexpected event, decision-makers may draw on their personal experiences to inform their decisions, partly because of a perceived gap in the evidence base on humanitarian action (8-10). In addition, the humanitarian domain can be conflicted on what constitutes evidence because the dividing lines among operational data, theory, and evidence are perceived as unclear. Humanitarian aid organizations may primarily rely on data stemming from their ground operations instead of considering the data alongside existing research evidence. This makes it imperative that we begin our discussion with a clear and simple definition of what constitutes research evidence.

I define research evidence as the output of research that has been conducted in a systematic way and reported in a transparent manner. My definition of research evidence includes evidence described in both empirical papers (e.g., observational studies, surveys and case studies) and conceptual papers (e.g., theoretical papers). It also includes primary studies and secondary research (e.g., systematic reviews and other forms of evidence

synthesis). This research evidence may appear in indexed bibliographic databases or in what is called the grey literature. I distinguish such research evidence from other types of information, including data, tacit knowledge or ordinary knowledge (11), and stakeholder opinions.

Decision-makers in the humanitarian aid sector have been asking how to make better use of research evidence in crisis zones (7, 12). Researchers have attempted to provide some tentative answers to this challenging question by highlighting the stages in the decision-making process where evidence can be used to inform decision-making in crisis zones (13-16). For example, research evidence can help clarify a problem. Second, evidence can help frame options to respond appropriately. Third, evidence can help address implementation considerations for interventions in specific contexts (Table 1). Research evidence can serve the same purposes in crisis zones. However, we still require deeper knowledge about the sources of information decision-makers draw upon to inform decision-making and the factors that influence their use of research evidence in crisis zones.

Table 1. Types of questions and sources of research evidence[1]

		About clinical & public health issues	About health and social system issues
Clarifying a problem	1	What is the **problem** (and its causes)? • A risk factor or condition • A program, service or product being used • Current health- and social-system (governance, financial and delivery) arrangements within which programs, services and products are provided • Current degree of implementation of an agreed course of action	
	2	How did the problem come to **attention** and has this process influenced the prospect of it being addressed?	• e.g., for Canada www.cihi.ca for national health and healthcare utilization databases • e.g., for all countries www.lexisnexis.com/hottopics/lnacademic/ for media coverage of health and social issues
	3	What **indicators** can be used, or collected, to establish the magnitude of the problem and to measure progress in addressing it?	
	4	What **comparisons** can be made to establish the magnitude of the problem and to measure progress in addressing it?	**PubMed HSR Queries** www.nlm.nih.gov/nichsr/hedges/search.html → Process assessment → Outcomes assessment	**Health Systems Evidence** for health-system arrangements www.healthsystemsevidence.org **Social Systems Evidence** for social challenges and social-system arrangements www.socialsystemsevidence.org
	5	How can a problem be **framed** (or described) in a way that will motivate different groups?	**PubMed HSR Queries** www.nlm.nih.gov/nichsr/hedges/ search.html → Qualitative research	
Framing options	1	Has an appropriate set of **options** been identified to address the problem (within one or more of the areas where problems were identified)? • Introducing, changing or discontinuing a program, service or product • Introducing, changing or discontinuing a health- or social-system arrangement that contributes to whether the right mix of programs, services and products get to those who need them • Implementing an agreed course of action	
	2	What **benefits** are important to those who will be affected and which benefits are likely to be achieved with each option?	**ACCESSSS (or Cochrane Library)** for clinical programs, services and drugs www.accessss.org (or www.cochranelibrary.com) **Health Evidence** for public health programs and services www.healthevidence.org	**Health Systems Evidence** for health system arrangements www.healthsystemsevidence.org **Social Systems Evidence** for social challenges and social-system arrangements www.socialsystemsevidence.org
	3	What **harms** are important to those who will be affected and which harms are likely to arise with each option?	
	4	What are the local **costs** of each option and is there local evidence about their **cost-effectiveness**?	**ACCESSSS (or PubMed HSR Queries)** for economic evaluations of any option www.accessss.org (or www.nlm.nih.gov/nichsr/hedges/search.html → Costs or economics)	
	5	What **adaptations** might be made to any given option and might they alter its benefits, harms and costs?	**PubMed HSR Queries** www.nlm.nih.gov/nichsr/hedges/search.html → Qualitative research	
	6	Which stakeholders' **views and experiences** might influence the acceptability of an option and its benefits, harms and costs?		

		About clinical & public health issues	About health and social system issues
Identifying implementation considerations	1	What are the potential **barriers** to and **facilitators** of the successful implementation of the policy or program (at each of the following levels)? • Patients/citizens (e.g., awareness of the availability of a free program) • Providers (e.g., adherence to guidelines) • Organizations (e.g., performance management) • Systems (e.g., enforcement of regulations)	
	2	What strategies should be considered in order to facilitate the necessary behavioural changes among **patients/citizens**?	**Health Systems Evidence** for implementation strategies in health systems www.healthsystemsevidence.org **Social Systems Evidence** for implementation strategies in social systems www.socialsystemsevidence.org
	3	What strategies should be considered in order to facilitate the necessary behavioural changes among **providers**?	
	4	What strategies should be considered in order to facilitate the necessary **organizational changes**?	
	5	What strategies should be considered in order to facilitate the necessary **system changes**?	
For **systematic reviews**: 1. What's the **quality** (AMSTAR) score? 2. How **locally applicable** are the key messages?		OR NOT AND	• "user fees" ≠ user fees • (doctor AND nurse) OR pharmacist ≠ doctor AND (nurse OR pharmacist) • nurs* = nurse OR nurses OR nursing

We know from the existing literature that decision-makers in crisis zones need readily accessible, reliable, up-to-date evidence to clarify a problem, frame options, and address implementation considerations (17-21). However, there has been very little research into strategies that would support the use of evidence in crisis zones. The field of knowledge translation has identified interventions to support the use of evidence in decision-making. Although there are several proposed theories and frameworks for achieving knowledge translation across sectors (22-24), frameworks that describe the key features of specific strategies for crisis zones are much less prominent or underdeveloped. For example, Lavis et al., (2006) provides a general understanding of system-level knowledge translation interventions: improving the general climate for research use; the production of relevant and appropriately synthesized evidence for users; activities that link research to action; and evaluation (23). However, it is not clear from this model which of these interventions will work best in crisis zones. Specific features of KT activities likely need to be tailored to achieve optimal outcomes in crisis zones.

Examples in the literature of failures to use research evidence to inform decision-making are apparent across all key decision-maker groups (e.g., patients/citizens, healthcare providers, managers, and policymakers) and in developed and developing countries (25, 26). A common challenge that all decision-makers face when trying to use research evidence to inform their decision-making relates to the lack of knowledge management skills and infrastructure (8, 27-29). For example, the huge volume of research evidence currently produced and scattered across journals, books, reports, and websites; many of which require a payment to access. Additionally, decision-makers lack time to read long systematic reviews and instead require a summary of the evidence that they can act upon in a short time-frame. Although systematic reviews are considered to be the highest level of evidence to help clarify a problem and frame options, findings from systematic reviews need to be coupled with feasibility considerations for interventions and the tacit knowledge and real world views and experiences of front line staff to make well-informed decisions (30). The same is true in crisis zones, where decision-makers frequently report that research evidence is not always relevant in terms of the issues they face and that evidence is not always accessible or translated into action (8-10).

This dissertation aims to address a series of gaps in the existing literature by answering the following specific objectives: 1) develop a conceptual framework that outlines the strategies and the facilitators of and barriers to research evidence use in crisis situations in LMICs; 2) examine the factors that influence the use of research evidence in the governmental health policy-development processes for Syrian refugees in Lebanon and Ontario; and 3) explore decisionmakers' views of and experiences with the Evidence

Aid website, putting forward specific suggestions about how to improve Evidence Aid, many of which can also be applied to other evidence websites.

Said another way, I begin this scholarly journey by examining and bringing order to what has been already done to support evidence use in crisis zones, then turn to examining evidence use in a crisis, and finally studying a strategy to support the use of evidence in crisis zones.

Approaches taken in the three studies

The research objectives are addressed in this thesis through three original scientific contributions that incorporate a mix of methodological approaches.

In chapter 2, I will employ a critical interpretive synthesis (CIS) approach, which uses many conventional systematic review processes but allows for the examination of both empirical and non-empirical literature (e.g., editorials, essays) and of both quantitative and qualitative empirical literature. Moreover, contrary to conventional systematic reviews where there is a well formulated research question at the outset, CIS employs a compass question that allow for a more iterative and responsive process of synthesis as different types of literatures open up new themes and relationships among themes (31, 32).

In chapter 3, I plan to use an embedded case-study design to examine the factors that influence the use of research evidence in the Lebanese Ministry of Public Health 2016 Health Response Strategy and the Ontario's 2016 Phase 2: Health System Action Plan designed to address the health needs of Syrian refugees. The richness of the phenomenon (i.e., addressing the health needs of Syrian refugees) and the complexity of

the real-life context (i.e., Syrian refugee crisis as it was experienced in Lebanon and Ontario) are well suited for a case study design.

Finally, in chapter 4 I will use a user testing study design to explore decisionmakers' views of and experiences with the Evidence Aid website and put forward specific suggestions about how to improve such evidence websites. This type of design is used widely in the field of product design and evaluation, and involves having users complete task-specific problems (33-35). User testing involves inviting representative users of a product (in this case a website) to participate in individual semi-structured interviews where they are asked about their experience as they interact with the website (36).

Substantive, methodological and theoretical gaps

Substantively, the development of a conceptual framework in chapter 2 outlining strategies to support the use of research evidence in crisis situations has the potential to enable different actors in crisis situations to reflect on how they can utilize their professional position to support the use of evidence in decision-making. My hope is that my framework and the strategies included in it serve as the starting point for incremental change to occur over time, with the goal of getting closer to addressing the knowledge needs of decision-makers in crisis situations. My planned analysis in chapter 3 of how do governments use evidence to develop health policy for Syrian refugees will provide rich qualitative insights for policymakers on how to best support the use of research evidence to inform policy-development processes. Finally, in chapter 4, I plan to evaluate an evidence website and provide specific suggestions to improve this key knowledge-

translation strategy designed to address the evidence needs of decision-makers working in crisis situations.

Methodologically, the use of a critical interpretive synthesis (CIS), a relatively new approach to reviewing the literature, can harness both a rigorous traditional systematic review methodology with the benefits of an interpretive approach (e.g., literature sampling, evolving compass question) and this will be the first time a CIS has been applied to this topic. The embedded case study that I plan to use in chapter 3 is an established research design used to address a novel research question about the factors that influence the use of research evidence in the policy-development processes for Syrian refugees in Lebanon and Ontario. The case study will incorporate data from multiple sources (e.g., policy documents, media articles, and published literature) and diverse types of decision-makers (e.g., senior decisionmakers, policy advisors, healthcare providers) to arrive at a comprehensive story of how the policy-development process for Syrian refugees unfolded and the factors that influenced it. The user testing study design I plan to use for Chapter 4 is widely used in the field of product design and specifically used here to focus on decision-makers' experience with using an evidence website for crisis situations.

Theoretically, chapter 2 will be the first qualitative study used to generate a new framework that outlines strategies, facilitators, and barriers to evidence use in crisis zones at different system levels (e.g., political, health, etc.,).

Research reflexivity

It is important to outline my motivations to conduct this research. First, I witnessed the challenge with the timely transfer of information to decision-makers in the field during the Ebola epidemic. Second, I approach this research partly as an insider, having worked in organizations that operate in crisis zones. Third, as an educator, I am curious about the best ways to support decision-makers in using research evidence. Finally, as a Jordanian citizen, I have witnessed first-hand the impact of the Syrian refugee crisis on host countries. Considering these motivations, I continuously reflected on the degree to which my personal and professional background have informed the work presented here.

Concluding comments

The goal throughout this scholarly journey is for the research chapters to build on each other. Specifically, the insights gained from the CIS will inform the analysis of my findings in my embedded qualitative case study and the purposive selection of an evidence website as a KT strategy to support evidence use in crisis zones. This will be the first package of studies that examines evidence use in crisis zones at a system level, uses a mixed methods approach that includes plans to interview diverse types of decision-makers in crisis zones, and attempts to put forward actionable strategies at different system levels to improve evidence use in crisis zones. The hope is that this work will push forward the scholarly discourse around this important challenge and ignite curiosity in other researchers to think creatively of workable solutions to addressing the challenge.

References:

1.   Lee ACK, Booth A, Challen K, Gardois P, Goodacre S. Disaster management in low-and middle-income countries: scoping review of the evidence base. Emerg Med J. 2014;31(e1):e78-e83.

2.   Ager A, Burnham G, Checchi F, Gayer M, Grais R, Henkens M, et al. Strengthening the evidence base for health programming in humanitarian crises. Science. 2014;345(6202):1290-2.

3.   Blanchet K, Roberts B, Sistenich V, Ramesh A, Frison S, Warren E, et al. An evidence review of research on health interventions in humanitarian crises. Final Report. 2013.

4.   Ammar W, Kdouh O, Hammoud R, Hamadeh R, Harb H, Ammar Z, et al. Health system resilience: Lebanon and the Syrian refugee crisis. Journal of global health. 2016;6(2).

5.   Karavokiros G, Lykou A, Koutiva I, Batica J, Kostaridis A, Alves A, et al. Providing Evidence-Based, Intelligent Support for Flood Resilient Planning and Policy: The PEARL Knowledge Base. Water. 2016;8(9):25.

6.   Jordan TH, Chen YT, Gasparini P, Madariaga R, Main I, Marzocchi W, et al. Operational Earthquake Forecasting: State of Knowledge and Guidelines for Utilization. Ann Geophys. 2011;54(4):315-91.

7.   Blanchet K, Allen C, Breckon J, Davies P, Duclos D, Jansen J, et al. Research Evidence in the Humanitarian Sector: A Practice Guide. 2018.

8.   Lindblom CE, Cohen DK. Usable knowledge: Social science and social problem solving: Yale University Press; 1979.

9.   Byrne KG, March J, McGuire S, Meissner L, Sperling L. The role of evidence in humanitarian assessment: The seed system security assessment and the emergency market mapping and analysis. Disasters. 2013;37(SUPPL.1):S83-S104.

10.   Mellon D. Evaluating Evidence Aid as a complex, multicomponent knowledge translation intervention. J Evid Based Med. 2015;8(1):25-30.

11.   Kayabu B. Evidence Aid approach to gap analysis and priority setting of questions for systematic reviews in disasters. J Evid Based Med. 2015;8(1):22-4.

12.   Clarke M. Evidence Aid--from the Asian tsunami to the Wenchuan earthquake. J Evid Based Med. 2008;1(1):9-11.

13.   Allen C, Clarke MJ. Evidence Aid: A resource for those preparing for and responding to disasters, humanitarian crises and major healthcare emergencies. Tropical Medicine and International Health. 2015;20:126.

14.   Eklund L, Tellier S. Gender and international crisis response: do we have the data, and does it matter? Disasters. 2012;36(4):589-608.

15.   Banatvala N, Zwi AB. Public health and humanitarian interventions: developing the evidence base. Bmj. 2000;321(7253):101-5.

16.   Reed BA, Habicht JP, Garza C. Translating nutrition research into action in humanitarian emergencies. Journal of Nutrition. 2002;132(7):2112S-6S.

17.   Tharyan P, Clarke M, Green S. How the Cochrane collaboration is responding to the Asian tsunami. PLoS Med. 2005;2(6):e169.

18.	Armstrong R, Waters E, Crockett B, Keleher H. The nature of evidence resources and knowledge translation for health promotion practitioners. Health Promotion International. 2007;22(3):254-60.
19.	Balshem H, Helfand M, Schünemann HJ, Oxman AD, Kunz R, Brozek J, et al. GRADE guidelines: 3. Rating the quality of evidence. Journal of clinical epidemiology. 2011;64(4):401-6.
20.	Lavis JN. How can we support the use of systematic reviews in policymaking? PLoS medicine. 2009;6(11):e1000141.
21.	Lavis JN, Lomas J, Hamid M, Sewankambo NK. Assessing country-level efforts to link research to action. Bulletin of the World Health Organization. 2006;84(8):620-8.
22.	Lavis JN. Research, public policymaking, and knowledge-translation processes: Canadian efforts to build bridges. Journal of Continuing Education in the Health Professions. 2006;26(1):37-45.
23.	Straus SE, Tetroe JM, Graham ID. Knowledge translation is the use of knowledge in health care decision making. Journal of clinical epidemiology. 2011;64(1):6-10.
24.	Lavis JN, Ross SE, Hurley JE. Examining the role of health services research in public policymaking. The Milbank Quarterly. 2002;80(1):125-54.
25.	Milner M, Estabrooks CA, Myrick F. Research utilization and clinical nurse educators: a systematic review. Journal of evaluation in clinical practice. 2006;12(6):639-55.
26.	Légaré F, Ratté S, Gravel K, Graham ID. Barriers and facilitators to implementing shared decision-making in clinical practice: update of a systematic review of health professionals' perceptions. Patient education and counseling. 2008;73(3):526-35.
27.	Grimshaw JM, Eccles MP, Walker AE, Thomas RE. Changing physicians' behavior: what works and thoughts on getting more things to work. Journal of Continuing Education in the Health Professions. 2002;22(4):237-43.
28.	Lavis J, Davies H, Oxman A, Denis J-L, Golden-Biddle K, Ferlie E. Towards systematic reviews that inform health care management and policy-making. Journal of health services research & policy. 2005;10(1_suppl):35-48.
29.	Dixon-Woods M, Cavers D, Agarwal S, Annandale E, Arthur A, Harvey J, et al. Conducting a critical interpretive synthesis of the literature on access to healthcare by vulnerable groups. BMC medical research methodology. 2006;6(1):35.
30.	Eakin JM, Mykhalovskiy E. Reframing the evaluation of qualitative health research: reflections on a review of appraisal guidelines in the health sciences. Journal of evaluation in clinical practice. 2003;9(2):187-94.
31.	Nielsen J, Loranger H. Prioritizing web usability: Pearson Education; 2006.
32.	Kuniavsky M. Observing the user experience: a practitioner's guide to user research: Elsevier; 2003.
33.	Van Den Haak M, De Jong M, Jan Schellens P. Retrospective vs. concurrent think-aloud protocols: testing the usability of an online library catalogue. Behaviour & information technology. 2003;22(5):339-51.
34.	Krahmer E, Ummelen N. Thinking about thinking aloud: A comparison of two verbal protocols for usability testing. IEEE Transactions on Professional Communication. 2004;47(2):105-17.

Chapter 2. Preface

This chapter takes a broad approach to examining the role of research evidence in decision-making in crisis zones through the application of a critical interpretive synthesis methodology. Insights gained from the critical interpretive synthesis led to the development of a new theoretical framework, which outlines strategies that leverage the facilitators and address the barriers to evidence use in decision-making in crisis zones within four different systems —political, health, humanitarian aid, health research.

I was responsible for conceptualizing the area of focus of the study, designing the study and executing the data collection and analysis. The included studies were identified from a search strategy executed from February 2017 to April 2017, with additional articles added throughout the analysis phase to fill any conceptual gaps. Dr. Kaelan Moat assisted with assessing documents for eligibility and inclusion in the review. My supervisor (Dr. John N. Lavis) contributed to the design as well as the analysis, synthesis and development of the theoretical framework, which was an iterative process. I drafted the thesis chapter and my supervisor and two other committee members (Dr. Meredith Vanstone and Dr. Fadi El-Jardali) provided feedback on various drafts, which was incorporated into the final version of the chapter.

Supporting the use of research evidence in decision-making in crisis zones in low- and middle-income countries: A critical interpretive synthesis

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Key messages:
1. Presents a new conceptual framework that outline strategies that leverage the facilitators and address the barriers to evidence use in crisis zones within different systems;
2. Systems include political, health, international humanitarian aid, and health research;
3. Outlines strategies that are systematic and directed at the appropriate end-user within different systems;
4. Expands on the literature pertaining to evidence-informed decision-making; and
5. First time a CIS has been applied to this topic.

Abstract

Decision-makers in crisis zones are faced with the challenge of having to make decisions under limited time and resources constraints and in light of the many factors that can influence their decisions, of which research evidence is just one. To address a key gap in the research literature about how best to support the use of research evidence in such situations, we conducted a critical interpretive synthesis approach to develop a conceptual framework that outlines the strategies that leverage the facilitators and address the barriers to evidence use in crisis zones. We systematically reviewed both empirical and nonempirical literature and used an interpretive analytic approach to synthesize the results and develop the conceptual framework. We used a "compass" question to create a detailed search strategy and conducted electronic searches in CINAHL, EMBASE, MEDLINE, SSCI and Web of Science. A second reviewer was assigned to a representative sample of articles. We purposively sampled additional papers to fill in conceptual gaps. We identified 21 eligible papers to be analyzed and purposively sampled an additional 6 to fill conceptual gaps. The synthesis resulted in a conceptual framework that focuses on evidence use in crisis zones examined through the lens of four systems - political, health, international humanitarian aid, and health research. Within each of the four systems, the framework identifies the most actionable strategies that leverage the facilitators and address the barriers to evidence use.

Introduction

The pressure to demonstrate that responses to crises are grounded in research evidence has been growing over recent years (1-3). While other domains have been able to make progress in this field, the humanitarian aid domain still faces some challenges (1, 4, 5). Part of the challenge may be a lack of understanding of the benefits of using evidence to inform decision-making. Research evidence can help decision-makers understand a problem, frame options to respond appropriately, and address implementation considerations for interventions in specific contexts. When used appropriately, evidence can help decision-makers build on the success of others and avoid repeating the failures of others, by learning from systematic studies of their impacts and experiences. A significant literature exists that examines the use of research evidence in decision-making, some of which pays particular attention to low- and middle-income countries (LMICs), where most crises occur (6-16). However, there is a need for theoretically informed framework outlining the strategies that would leverage facilitators and address the barriers to evidence-informed decision-making in crisis zones in LMICs. This study aims to fill this gap by developing a conceptual framework.

Decision-making is complex, both because it is context dependent and because it is often influenced by the need to act quickly in sometimes less than ideal situations with relatively little access to information. Recognizing this complexity, evidence-informed decision-making has been described as an approach that aims to ensure that decisions are influenced by the best available research evidence, while acknowledging the other factors that influence it (17). These other factors include institutional constraints, interests, ideas

such as values, and external factors like the election of a new governing party. In spite of these complexities, strengthening the use of research evidence in decision-making holds the promise of achieving better use of limited humanitarian aid resources.

One area to consider when seeking to strengthen the use of research evidence in crisis zones is what strategies can be used to support evidence informed-decision-making. Up until now, the thinking about the strategies has been mostly confined to the research system, with an emphasis on making evidence more available and accessible to decision-makers, and less on formalized processes for facilitating its use (5, 18, 19). When the focus turns to the humanitarian aid system, the emphasis has been more on establishing a receptive climate for evidence (20). There has been less attention given to systems beyond the research and humanitarian aid systems. Given the very little research into a fulsome array of strategies to support evidence use in crisis zones, both within and beyond the research and humanitarian aid systems, our compass question is what are the strategies that leverage the facilitators and address the barriers to evidence use in crisis zones in LMICs? The strategies to support evidence use in crisis zones can be employed to integrate the use of evidence more systematically within different systems.

Methods

Design

We used a critical interpretive synthesis (CIS) to develop the theoretical framework. CIS, developed by Dixon-Woods et al (2006), uses many conventional systematic review processes but allows for the examination of both quantitative and qualitative empirical and non-empirical literature (e.g., editorials, essays). This approach is particularly appropriate for this study because there is an ill-defined, diverse yet nascent body of literature on the barriers to and facilitators of strategies to support evidence use in crisis zones in LMICs. Moreover, contrary to conventional systematic reviews where there is a well formulated research question at the outset, CIS employs a compass question that allow for a more iterative and responsive process of synthesis as different types of literatures open up new themes and relationships among themes (21, 22).

Literature search

The literature search was carried out in phases and guided by our compass question and included available research literature that aims, through empirical or non-empirical approaches, to contribute to generalizable knowledge (Figure 1). Initial search terms were developed in consultation with a librarian. Several sample search strategies were run, and the strategies were adjusted iteratively. Small adjustments were made to the search string for each database to ensure that the formatting is optimal for that database. These database searches were complemented with reviews of the websites of relevant non-governmental organizations (e.g., Médecins Sans Frontières) and international

agencies (e.g., World Health Organization), and a hand search of reference lists from relevant articles. The searches were executed from February 2017 to April 2017, with additional articles added throughout the analysis phase to fill any conceptual gaps. Duplicate articles resulting from the above parameters were excluded using EndNote database.

Article selection

For inclusion, the documents had to provide examples of strategies, facilitators and/or barriers to evidence use in crisis zones in LMICs. For the purpose of article selection, we defined research evidence as the output of research that has been conducted in a systematic way and reported in a transparent manner. Our definition of research evidence includes evidence described in both empirical papers (e.g., observational studies, surveys and case studies) and conceptual papers (e.g., theoretical papers). It also includes both primary studies and secondary research (e.g., systematic reviews and other forms of evidence synthesis). We distinguish such research evidence from other types of information, including data, tacit knowledge or ordinary knowledge (23), and stakeholder opinions.

We excluded the following types of articles: 1) focused on translating clinical research into practice; 2) focused on translating health knowledge to citizens (e.g., patients, members of the public); 3) focused on information systems that deal with raw data and not research evidence; and 4) deemed to be fatally flawed (as determined by an adapted version of the criteria proposed by the National Health Service National

Electronic Library for Health for the evaluation of qualitative research, which assess the appropriateness of the aims and objectives and of the research design, etc.).

We assessed the relevance of included studies in the synthesis. For the purposes of this interpretive review, we applied a low threshold of relevance to maximize the inclusion and contribution of a wide variety of papers that address the objectives of this synthesis (24). We did not perform an appraisal of quality because the core objective is the development of a theoretical framework based on insights and interpretation drawn from relevant sources, rather than those that meet particular quality criteria.

A second reviewer (K. Moat) was assigned to a representative sample of articles to ensure intercoder reliability at two stages of article selection (e.g., titles and abstracts and full-text documents). Given that this is a mixed method synthesis, a Cohen's Kappa statistic measuring inter-rater agreement was performed with the intent of spurring reflection about the inclusion and exclusion criteria for this study rather than being overly focused on the quantitative estimate (25). As a result of that reflection, we developed a working dictionary of key terms to be used in the synthesis (e.g., knowledge vs. research evidence). Discrepancies were identified and resolved through discussion.

Similar to a grounded theory approach, additional articles were purposively sampled from the broader literature that provided insight into strategies to support evidence use in other settings but that are equally relevant to crisis zones (26). The additional articles helped with the interpretive process that led to our conceptual framework.

Data synthesis and analysis

All included papers (*n=27*) were read in full and any specific information in the results and discussion sections of the included papers that shed light into the topic area were considered as data. The overarching guide used when developing categories for data synthesis was that the category contributed to answering our compass question. Concepts that were repeated in papers that do not provide a new insight into the topic area were excluded as the focus was on uncovering new insights into the strategies to support evidence use, and the facilitators of and barriers to evidence use in crisis zones.

Facilitators and barriers to evidence use were identified if they were referenced in the original text. Strategies were identified for this synthesis in three ways. First, strategies were identified if they were explicitly referenced in the original text. Second, strategies were deduced and extrapolated based on the implications of the identified facilitators and barriers in the literature and the principal investigator's cumulated understanding of the knowledge translation (KT) field. Third, strategies were drawn from the broader literature that provided insight into strategies to support evidence use in other settings but that are equally relevant to crisis zones. For example, strategies were drawn from the Lavis et al. (2006) framework for assessing country-level strategies to link research to action and the Cochrane Knowledge Translation Strategy framework (27) (28).

An interpretive analytic approach was used to synthesize the results and help develop the conceptual framework. We used a constant comparative method throughout the analysis where emerging data was compared to previously collected data to find

similarities and differences (26, 29). This approach included observations on the concepts used to describe the strategies that leverage the facilitators and address the barriers to evidence use within each system. All data collected were reviewed and detailed notes of the concepts that emerged were included in the analysis.

Results

Included articles

All 27 documents selected were published between 2002 and 2017 (Table 1). The region of focus for all documents was LMICs, with a wide range of country of focus (e.g., India, Peru, South Africa). Of the 27 documents, sixteen focused solely on natural hazards (e.g., tsunami), five on man-made hazards (e.g., armed conflict), and six on both. The Cohen's Kappa was 0.78 for the initial eligibility screen based on titles and abstracts and it was 0.87 for the full-text documents assessment, both of which are considered excellent inter-rater agreement (30). Five articles were deemed fatally flawed and thereby excluded from our results.

Four-part structure of the framework

Our analysis of the findings from the literature resulted in a conceptual framework (Figure 2) that focuses on evidence use in crisis zones examined through the lens of four distinct systems that crisis zones operate within (i.e., political, health, international humanitarian aid, and health research). The political system refers to the various actors at the government level tasked with setting laws that pertain to the health, international humanitarian aid, and health research system. For the political system, the two main domains consists of institutional constraints and different actors interests influencing evidence use, informed through the 3-I framework – a political science framework with three categories of influences on the policy-making process — ideas, interests, and institutions (31).

The health system refers to Ministries of Health and health organizations that when well-functioning are able to get the right programs, services, and drugs to those who need them. The international humanitarian aid system refers to organizations that are involved in delivery of humanitarian aid services. The health research system refers to the people and organizations engaged in the conduct, synthesis and dissemination of research (32). For the health, international humanitarian aid, and health research systems, the facilitators and barriers were analyzed according to arrangements that were informed through an established health systems taxonomy that includes: governance (i.e., who can make what types of decisions to support evidence use), financial (i.e., understanding how funds can be channeled in ways that support evidence use), and delivery (i.e., infrastructure to support evidence use) (33). Within each of the four systems, the framework identifies the most actionable strategies that leverage the facilitators and address the barriers to evidence use.

Table 2 outlines in more detail the facilitators of and barriers to evidence use in crisis zones in LMICs and the strategies aimed at specific actors within each system to support evidence use. We provide below our interpretation about the strategies that leverage the facilitators and address the barriers to support evidence use in decision-making in crisis zones, recognizing that many of them are transferable across other applicable systems.

Strategies, facilitators and barriers in each part of the framework

Political system

Policymaking about the health, international humanitarian aid, and research systems have historically drawn heavily on professional opinion (34-38). The reliance on professional opinion is attributed to two main reasons. First, decision-makers perceive a lack of existing research evidence to clarify problems, frame options, and address implementation considerations. Second, decision-makers need research evidence presented to them alongside other factors that influence their decisions (e.g., stakeholders' opinions and citizens' values). Relying solely on professional opinion comes with potential associated errors (39). For example, cognitive bias is a type of error in thinking that stems from our inability to be entirely objective resulting in inaccurate judgement. This is not to say that professional opinions should not be highly valued, but rather that it has to be considered alongside the existing research evidence to minimize associated errors.

There are at least two strategies that policy-makers can draw upon to address the barrier of research evidence not being presented alongside other factors that influence decision-making. First, stakeholder dialogues aim to place relevant evidence alongside professional opinion (40). This strategy is better suited to a protracted crisis as it requires time to prepare an evidence brief to inform the dialogue and adequate resources to support this type of collective problem-solving (e.g., infrastructure needed to convene the dialogue participants). For example, the Knowledge to Policy (K2P) Center in Beirut produced evidence briefs and conducted policy dialogues over a six-months period to

support evidence use in the country's response to the Syrian refugee crisis (41, 42). For a fast-evolving crisis, a rapid evidence service can answer an urgent question with the best available evidence alone or alongside insights from key stakeholders (drawn from key-informant interviews) in a short time-frame (43).

Health system

The barriers to the use of evidence at the health system level deal mostly with key stakeholders' involvement with the health services element of humanitarian aid delivery. Stakeholder involvement serves two purposes in supporting evidence use in crisis zones (1, 36, 44-46). First, it allows for sharing of evidence among the appropriate groups in a system that has adopted a networked approach to delivering health services as part of humanitarian aid. Second, it strengthens "local ownership of research", which facilitates better uptake of evidence (36). For example, the Lebanese health system during the Syrian refugee crises established networks with key stakeholders to collect and share relevant evidence and other types of information to better address the health needs of Syrian refugees (47).

To address challenges with stakeholder involvement and given the dynamic environment of crises, it is imperative for health system leaders to invest in building partnerships with key stakeholders involved in the delivery of the health services element of humanitarian aid to improve evidence sharing and use (36, 48, 49). One way to build this partnership is by leveraging technology to facilitate evidence-informed discussions among stakeholders. For example, a National Emergency Management Network (NEMN) was created after Hurricane Katrina, which is basically an emergency management

software program that provides a common platform with other participants to share relevant information (50, 51).

International humanitarian aid system

Creating new evidence is a costly and time-consuming strategy. A recent estimate found that there are more than 200,000 systematic reviews across all topic areas, although only a small fraction of these reviews are related to humanitarian aid (52). Undoubtedly there will always be gaps that need filling in the existing evidence on humanitarian action (53, 54). However, there is an abundance of existing evidence that is not being used by humanitarian aid workers because of access barriers (e.g., payment required to access evidence, evidence scattered across reports and journals) (34, 36, 45, 46, 55-60).

Evidence websites do exist and can help to address the barriers related to access to systematic reviews. For example, Evidence Aid website collates systematic reviews specifically aimed at humanitarian action (54). However, there is a need to increase awareness among humanitarian aid workers on the existence of such sites and their added value in supporting evidence use in decision-making (1, 36, 45, 55, 58, 61). Humanitarian aid organizations can host training workshops that can be customized to address decision-makers evidence needs in crisis zones. Additionally, decision-makers can enroll in online courses designed to help them find and use research evidence to inform their decision-making (e.g., McMaster Health Forum "finding and using research evidence to inform decision-making in health systems and organizations").

Health research system

Supporting the use of healthcare research in decision-making is a complex process that both researchers and decision-makers in crisis zones struggle with (62). Many authors emphasized that part of the struggle is that existing evidence does not meet decision-makers' needs (e.g., evidence about interventions does not address implementations considerations) and that the evidence is not presented in a concise manner that can be easily understood by non-technical decision-makers (1, 34-38, 44-46, 54-56, 58, 60, 61, 63-69).

The research literature on the best strategies to support the use of research evidence in decision-making suggests that interactive engagement between researchers and decision-makers may be most effective (70). For example, decision-makers can be engaged in research priority-setting processes to develop specific research questions related to humanitarian action in crisis zones (34, 36, 44-46, 54, 55, 58, 61, 71, 72). Another key strategy is to develop and disseminate actionable messages for decision-makers, particularly by research organizations that produce syntheses or systematic reviews, not single studies. Systematic reviews "focus on bodies of research knowledge" that are critical to the development of actionable messages (70). Knowledge brokers can fill the gap by acting as 'intermediaries' between the world of research and decision-making, helping to turn research findings into actionable messages to support their use in crisis zones (44, 45, 49, 73-75).

Discussion

Our theoretical framework can be thought of as a heuristic that can be used to identify: 1) the strategies that can be employed to integrate the use of evidence more systematically into decision-making; and 2) the facilitators and barriers that influence evidence use in decision-making in crisis zones individually and in relation to each other (Figure 2). The different strategies can be undertaken by different actors within each system – political, health, humanitarian aid, and research—that have an influence on the use of evidence in crisis zones. The strategies to support evidence use can occur sequentially or simultaneously within or across the four systems. Our conceptual framework offers a window into the continued progress regarding both the conceptual and practical implementation of strategies to support evidence use in decision-making in crisis zones.

Discussion around the use of evidence in humanitarian action has been ongoing since the 1990s, but much of the discussion has been around filling the knowledge gaps by conducting new research in crisis zones. Our review recognizes that there are times when the existing research evidence on crisis zones is lacking (e.g., crisis-specific facilitators of and barriers to the implementation of interventions) and rapid operational research is needed. However, strategies are needed to support the use of the vast pool of high quality and locally applicable research evidence. For example, an organization has collected such evidence in a freely available online resource (e.g., Evidence Aid).

The focus in the broader literature has been on emphasizing the importance of research evidence, even as it acknowledges that research evidence is only one input into

the decision-making processes (76-79). This is especially problematic in the humanitarian aid sector where professional judgement is known to play a key role in informing decisions (1, 52, 80, 81). Our review recognizes that decisions are not determined by evidence alone, but rather alongside professional opinion and other inputs to decision-making. This is why in the political system, we proposed strategies such as stakeholders dialogues that allow the research evidence to put alongside the tacit knowledge and real world views and experiences of front line staff (82).

The broader literature contains many strategies to support evidence-informed decision-making in other settings, that are equally relevant to crisis zones (20, 28, 40, 74, 82-84). For example, in healthcare settings, rapid evidence summaries have emerged as a responsive approach involving the presentation of short summary of evidence from systematic reviews, making them more useful and easier to take in by decision-makers (85). Rapid evidence summaries can also be useful in the humanitarian aid sector, given the need for evidence to be presented in a concise manner that can be easily understood by non-technical decision-makers in a short time-frame (34-38, 44, 46, 55, 59, 63, 65, 86).

Strengths and limitations

The strengths of the study included the use of a critical interpretive synthesis methodology that harnessed both a rigorous traditional systematic review methodology with the benefits of an interpretive approach (e.g., evolving compass question, purposive sampling of a diverse literature). Additionally, a second reviewer was involved in two phases of article selection and inclusion phase and a Cohen's Kappa statistic was

completed, with a result that indicated excellent inter-rater agreement and spurred reflection about the appropriate inclusion and exclusion of articles. Finally, the synthesis identified the strategies to support evidence use, and the facilitators of and barriers to evidence use, within different systems, which can serve as a point of departure for researchers undertaking empirical work that focuses on one or more specific systems.

Despite the merits of our approach, a limitation of the study was that at times it was difficult to know from the literature which system the strategies to support evidence use in crisis zones are best handled by, and within a system whether the strategies are focused on policy-makers, health-system leaders, humanitarian aid decision-makers, or research producers. We addressed this limitation by drawing on existing knowledge translation literature to inform our interpretation of those who would be best positioned to support evidence use.

Implications for policy and practice

The results of our study may enable different actors in crisis zones to reflect on how they can utilize their professional position to support the use of evidence in decision-making, both in the system within their sphere of at least potential control and in the other systems that may be within their sphere of influence. For example, policy-makers in the political system can engage researchers in the health research system to help facilitate a stakeholder dialogue. We recognize that asking these actors to adopt or adapt established strategies and develop new ones that address all the barriers and leverage all of the facilitators is a big challenge to undertake. Our hope is that our framework and strategies

serve as the starting point for incremental change to occur over time with the goal of getting closer to addressing the evidence needs of decision-makers in crisis zones.

Future research

Future studies could apply our theoretical framework in purposively sampled crises, examining specific facilitators of and barriers to research evidence use in decision-making and which of any strategies are used to leverage the facilitators or address barriers. This would be beneficial in drawing lessons from the framework's application and in identifying gaps in the framework that need to be addressed. Additionally, future studies could apply the strategies in one or more of the four involved systems to examine whether and how they increase the prospects for evidence use in crisis zones. This could potentially better inform the design of future strategies to support the use of research evidence in such situations.

Abbreviations:

LMICs: low- and middle-income countries; CIS: critical interpretive synthesis; KT: knowledge translation; K2P: Knowledge to Policy; NEMN: National Emergency Management Network

References:
1.   Blanchet K, Ramesh A, Frison S, Warren E, Hossain M, Smith J, et al. Evidence on public health interventions in humanitarian crises. The Lancet. 2017.
2.   Dijkzeul D, Hilhorst D, Walker P. Introduction: evidence-based action in humanitarian crises. Disasters. 2013;37:S1-S19.
3.   Ager A, Burnham G, Checchi F, Gayer M, Grais RF, Henkens M, et al. Strengthening the evidence base for health programming in humanitarian crises. Science. 2014;345(6202):1290-2.
4.   Banatvala N, Zwi AB. Public health and humanitarian interventions: developing the evidence base. Bmj. 2000;321(7253):101-5.
5.   Turner T, Green S, Harris C. Supporting evidence-based health care in crises: what information do humanitarian organizations need? Disaster medicine and public health preparedness. 2011;5(1):69-72.
6.   Innvær S, Vist G, Trommald M, Oxman A. Health policy-makers' perceptions of their use of evidence: a systematic review. Journal of health services research & policy. 2002;7(4):239-44.
7.   Harries U, Elliott H, Higgins A. Evidence-based policy-making in the NHS: exploring the interface between research and the commissioning process. Journal of Public Health. 1999;21(1):29-36.
8.   Orton L, Lloyd-Williams F, Taylor-Robinson D, O'Flaherty M, Capewell S. The use of research evidence in public health decision making processes: systematic review. PloS one. 2011;6(7):e21704.
9.   Lavis JN, Ross SE, Hurley JE. Examining the role of health services research in public policymaking. The Milbank Quarterly. 2002;80(1):125-54.
10.   Jewell CJ, Bero LA. "Developing good taste in evidence": facilitators of and hindrances to evidence-informed health policymaking in state government. The Milbank Quarterly. 2008;86(2):177-208.
11.   Sauerborn R, Nitayarumphong S, Gerhardus A. Strategies to enhance the use of health systems research for health sector reform. Tropical Medicine & International Health. 1999;4(12):827-35.
12.   Cheung A, Lavis JN, Hamandi A, El-Jardali F, Sachs J, Sewankambo N. Climate for evidence-informed health systems: a print media analysis in 44 low-and middle-income countries that host knowledge-translation platforms. Health Res Policy Syst. 2011;9(1):7.
13.   Hyder AA, Corluka A, Winch PJ, El-Shinnawy A, Ghassany H, Malekafzali H, et al. National policy-makers speak out: are researchers giving them what they need? Health policy and planning. 2010;26(1):73-82.
14.   Pappaioanou M, Malison M, Wilkins K, Otto B, Goodman RA, Churchill RE, et al. Strengthening capacity in developing countries for evidence-based public health:: the data for decision-making project. Social science & medicine. 2003;57(10):1925-37.
15.   Varkevisser CM, Mwaluko GM, Le Grand A. Research in action: the training approach of the Joint Health Systems Research Project for the Southern African Region. Health policy and planning. 2001;16(3):281-91.

16.   Shroff Z, Aulakh B, Gilson L, Agyepong IA, El-Jardali F, Ghaffar A. Incorporating research evidence into decision-making processes: researcher and decision-maker perceptions from five low-and middle-income countries. Health Res Policy Syst. 2015;13(1):70.

17.   Oxman AD, Lavis JN, Fretheim A, Lewin S. SUPPORT Tools for evidence-informed health Policymaking (STP) 17: Dealing with insufficient research evidence. Health Res Policy Syst. 2009;7(1):S17.

18.   Kayabu B, Clarke M. The use of systematic reviews and other research evidence in disasters and related areas: preliminary report of a needs assessment survey. PLoS currents. 2013;5.

19.   Pringle JD, Cole DC. Health research in complex emergencies: A humanitarian imperative. Journal of Academic Ethics. 2009;7(1-2):115-23.

20.   Ellen ME, Léon G, Bouchard G, Lavis JN, Ouimet M, Grimshaw JM. What supports do health system organizations have in place to facilitate evidence-informed decision-making? A qualitative study. Implementation Science. 2013;8(1):84.

21.   Dixon-Woods M, Cavers D, Agarwal S, Annandale E, Arthur A, Harvey J, et al. Conducting a critical interpretive synthesis of the literature on access to healthcare by vulnerable groups. BMC medical research methodology. 2006;6(1):35.

22.   Eakin JM, Mykhalovskiy E. Reframing the evaluation of qualitative health research: reflections on a review of appraisal guidelines in the health sciences. Journal of evaluation in clinical practice. 2003;9(2):187-94.

23.   Lindblom CE, Cohen DK. Usable knowledge: Social science and social problem solving: Yale University Press; 1979.

24.   Majid U, Vanstone M. Appraising qualitative research for evidence syntheses: a compendium of quality appraisal tools. Qualitative health research. 2018;28(13):2115-31.

25.   Cohen J. Weighted kappa: Nominal scale agreement provision for scaled disagreement or partial credit. Psychological bulletin. 1968;70(4):213.

26.   Glaser B, Strauss A. The discovery of grounded theory: Strategies for qualitative research: Transaction Publishers. 2009.

27.   Lavis JN, Lomas J, Hamid M, Sewankambo NK. Assessing country-level efforts to link research to action. Bulletin of the World Health Organization. 2006;84(8):620-8.

28.   Cochrane. Cochrane Knowledge Translation Strategy. Cochrane. 2017:19.

29.   Charmaz K. Constructing grounded theory: Sage; 2014.

30.   Fleiss JL, Cohen J, Everitt B. Large sample standard errors of kappa and weighted kappa. Psychological Bulletin. 1969;72(5):323.

31.   Hall PA. The role of interests, institutions, and ideas in the comparative political economy of the industrialized nations. Comparative politics: Rationality, culture, and structure. 1997:174-207.

32.   Pang T, Sadana R, Hanney S, Bhutta ZA, Hyder AA, Simon J. Knowledge for better health: a conceptual framework and foundation for health research systems. Bulletin of the World Health Organization. 2003;81(11):815-20.

33.   Lavis JN, Wilson MG, Moat KA, Hammill AC, Boyko JA, Grimshaw JM, et al. Developing and refining the methods for a 'one-stop shop'for research evidence about health systems. Health Res Policy Syst. 2015;13(1):10.

34.   Knox Clarke P, Darcy J. Insufficient Evidence? The Quality and Use of Evidence in Humanitarian Action (ALNAP Study). London: ALNAP/ODI. 2014.
35.   Lee AC. Barriers to evidence-based disaster management in Nepal: a qualitative study. Public Health. 2016;133:99-106.
36.   Initatives H. Humanitarian evidence systems mapping in East Africa Bristol, UK; January 2016.
37.   Reed BA, Habicht JP, Garza C. Translating nutrition research into action in humanitarian emergencies. Journal of Nutrition. 2002;132(7):2112S-6S.
38.   Mahapatra P. The need for evidence-based public health response in disasters. J Evid Based Med. 2014;7(4):238-44.
39.   Hermann CF. International crises; insights from behavioral research: Free Press; 1972.
40.   Boyko JA, Lavis JN, Abelson J, Dobbins M, Carter N. Deliberative dialogues as a mechanism for knowledge translation and exchange in health systems decision-making. Social Science & Medicine. 2012;75(11):1938-45.
41.   El-Jardali F, Hammoud R, Fouad F, Bou Karoum L. K2P Briefing Note: Promoting Access to Essential Health Care Services for Syrian Refugees in Lebanon. Knowledge to Policy (K2P) Center Beirut, Lebanon. 2014:6.
42.   El-Jardali F, Lavis JN, Ataya N, Jamal D. Use of health systems and policy research evidence in the health policymaking in eastern Mediterranean countries: views and practices of researchers. Implement Sci. 2012;7:2.
43.   Mijumbi RM, Oxman AD, Panisset U, Sewankambo NK. Feasibility of a rapid response mechanism to meet policymakers' urgent needs for research evidence about health systems in a low income country: a case study. Implementation Science. 2014;9(1):114.
44.   Tol WA, Patel V, Tomlinson M, Baingana F, Galappatti A, Silove D, et al. Relevance or excellence? Setting research priorities for mental health and psychosocial support in humanitarian settings. Harv Rev Psychiatry. 2012;20(1):25-36.
45.   Woodward A, Sheahan K, Martineau T, Sondorp E. Health systems research in fragile and conflict affected states: a qualitative study of associated challenges. Health Res Policy Syst. 2017;15(1):44.
46.   Bornemisza O, Zwi A. Neglected health systems research: Health policy and systems research in conflict-affected fragile states. Geneva: World Health Organisation. 2009.
47.   Ammar W, Kdouh O, Hammoud R, Hamadeh R, Harb H, Ammar Z, et al. Health system resilience: Lebanon and the Syrian refugee crisis. Journal of global health. 2016;6(2).
48.   Reyers B, Nel JL, O'Farrell PJ, Sitas N, Nel DC. Navigating complexity through knowledge coproduction: Mainstreaming ecosystem services into disaster risk reduction. Proc Natl Acad Sci U S A. 2015;112(24):7362-8.
49.   Sitas N, Reyers B, Cundill G, Prozesky HE, Nel JL, Esler KJ. Fostering collaboration for knowledge and action in disaster management in South Africa. Curr Opin Environ Sustain. 2016;19:94-102.

50.   Kapucu N, Arslan T, Demiroz F. Collaborative emergency management and national emergency management network. Disaster Prevention and Management: An International Journal. 2010;19(4):452-68.

51.   Kapucu N, Garayev V. Collaborative decision-making in emergency and disaster management. International Journal of Public Administration. 2011;34(6):366-75.

52.   Blanchet K, Allen C, Breckon J, Davies P, Duclos D, Jansen J, et al. Research Evidence in the Humanitarian Sector: A Practice Guide. 2018.

53.   Lee ACK. Barriers to evidence-based disaster management in Nepal: A qualitative study. Public Health. 2016;133:99-106.

54.   Clarke M. Evidence Aid--from the Asian tsunami to the Wenchuan earthquake. J Evid Based Med. 2008;1(1):9-11.

55.   Altay N, Labonte M. Challenges in humanitarian information management and exchange: evidence from Haiti. Disasters. 2014;38 Suppl 1:S50-72.

56.   Lee AC, Booth A, Challen K, Gardois P, Goodacre S. Disaster management in low- and middle-income countries: scoping review of the evidence base. Emergency Medicine Journal. 2014;31(e1):e78-83.

57.   Kadhiravan T. Why do we need systematic reviews to inform healthcare decisions in the disaster context. J Evid Based Med. 2015;8(2):103-7.

58.   Gimenez R, Hernantes J, Labaka L, Sarriegi JM, Lauge A. Developing a Community of Practice to Learn, Share and Improve in Emergency Management. In: Vivas C, Sequeira P, editors. Proceedings of the 15th European Conference on Knowledge Management. Proceedings of the European Conference on Knowledge Management. Nr Reading: Acad Conferences Ltd; 2014. p. 395-401.

59.   Tharyan P, Clarke M, Green S. How the Cochrane collaboration is responding to the Asian tsunami. PLoS Med. 2005;2(6):e169.

60.   O'Mathuna DP. Conducting research in the aftermath of disasters: ethical considerations. J Evid Based Med. 2010;3(2):65-75.

61.   Woodward A, Sondorp E, Witter S, Martineau T. Health systems research in fragile and conflict-affected states: a research agenda-setting exercise. Health Res Policy Syst. 2016;14(1):51.

62.   Ward V, House A, Hamer S. Knowledge brokering: the missing link in the evidence to action chain? Evidence & policy: a journal of research, debate and practice. 2009;5(3):267-79.

63.   Mellon D. Evaluating Evidence Aid as a complex, multicomponent knowledge translation intervention. J Evid Based Med. 2015;8(1):25-30.

64.   Kayabu B. Evidence Aid approach to gap analysis and priority setting of questions for systematic reviews in disasters. J Evid Based Med. 2015;8(1):22-4.

65.   Allen C, Clarke MJ. Evidence Aid: A resource for those preparing for and responding to disasters, humanitarian crises and major healthcare emergencies. Tropical Medicine and International Health. 2015;20:126.

66.   Mutasa M. Knowledge apartheid in disaster risk management discourse: Is marrying indigenous and scientific knowledge the missing link? Jamba-J Disaster Risk Stud. 2015;7(1):10.

67.   Pottie K. Health equity in humanitarian emergencies: a role for evidence aid. J Evid Based Med. 2015;8(1):36-8.
68.   Bradt DA. Evidence-based decision-making in humanitarian assistance. HPN Network Paper-Humanitarian Practice Network, Overseas Development Institute. 2009(67).
69.   Garfield R. Common needs assessments and humanitarian action: Humanitarian Practice Network, Overseas Development Institute; 2010.
70.   Lavis JN, Robertson D, Woodside JM, McLeod CB, Abelson J. How can research organizations more effectively transfer research knowledge to decision makers? The Milbank Quarterly. 2003;81(2):221-48.
71.   Gregoire V, Evans M, Le QT, Bourhis J, Budach V, Chen A, et al. Delineation of the primary tumour Clinical Target Volumes (CTV-P) in laryngeal, hypopharyngeal, oropharyngeal and oral cavity squamous cell carcinoma: AIRO, CACA, DAHANCA, EORTC, GEORCC, GORTEC, HKNPCSG, HNCIG, IAG-KHT, LPRHHT, NCIC CTG, NCRI, NRG Oncology, PHNS, SBRT, SOMERA, SRO, SSHNO, TROG consensus guidelines. Radiotherapy and Oncology. 2017.
72.   Jillson IA, Clarke M, Allen C, Waller S, Koehlmoos T, Mumford W, et al. Improving the science and evidence base of disaster response: a policy research study. BMC health services research. 2019;19(1):274.
73.   Lomas J. The in-between world of knowledge brokering. Bmj. 2007;334(7585):129-32.
74.   Lavis JN, Boyko JA, Oxman AD, Lewin S, Fretheim A. SUPPORT Tools for evidence-informed health Policymaking (STP) 14: Organising and using policy dialogues to support evidence-informed policymaking. Health Research Policy and Systems. 2009;7(1):S14.
75.   Lomas J. Improving research dissemination and uptake in the health sector: beyond the sound of one hand clapping: Centre for health economics and policy analysis Hamilton; 1997.
76.   Chalmers I. If evidence-informed policy works in practice, does it matter if it doesn't work in theory? Evidence & Policy: A Journal of Research, Debate and Practice. 2005;1(2):227-42.
77.   Straus SE, McAlister FA. Evidence-based medicine: a commentary on common criticisms. Cmaj. 2000;163(7):837-41.
78.   Clarence E. Technocracy reinvented: the new evidence based policy movement. Sage Publications Sage CA: Thousand Oaks, CA; 2002.
79.   Parsons W. From muddling through to muddling up-evidence based policy making and the modernisation of British Government. Public policy and administration. 2002;17(3):43-60.
80.   Blanchet K, Roberts B, Sistenich V, Ramesh A, Frison S, Warren E, et al. An evidence review of research on health interventions in humanitarian crises. Final Report. 2013.
81.   Blanchet K, Ramesh A, Frison S, Warren E, Hossain M, Smith J, et al. Health in humanitarian crises 1 Evidence on public health interventions in humanitarian crises. 2017.

82.   Lavis JN, Boyko JA, Gauvin F-P. Evaluating deliberative dialogues focussed on healthy public policy. BMC Public Health. 2014;14(1):1287.
83.   Ellen ME, Léon G, Bouchard G, Ouimet M, Grimshaw JM, Lavis JN. Barriers, facilitators and views about next steps to implementing supports for evidence-informed decision-making in health systems: a qualitative study. Implementation Science. 2014;9(1):179.
84.   Khangura S, Konnyu K, Cushman R, Grimshaw J, Moher D. Evidence summaries: the evolution of a rapid review approach. Systematic reviews. 2012;1(1):10.
85.   Chambers D, Wilson PM, Thompson CA, Hanbury A, Farley K, Light K. Maximizing the impact of systematic reviews in health care decision making: a systematic scoping review of knowledge-translation resources. The Milbank Quarterly. 2011;89(1):131-56.
86.   Roy N, Thakkar P, Shah H. Developing-world disaster research: present evidence and future priorities. Disaster med. 2011;5(2):112-6.
87.   Redmond AD, Mardel S, Taithe B, Calvot T, Gosney J, Duttine A, et al. A qualitative and quantitative study of the surgical and rehabilitation response to the earthquake in Haiti, January 2010. Prehospital and disaster medicine. 2011;26(6):449-56.
88.   Doocy S, Daniels A, Packer C, Dick A, Kirsch TD. The human impact of earthquakes: a historical review of events 1980-2009 and systematic literature review. PLoS currents. 2013;5.
89.   Kreiss Y, Merin O, Peleg K, Levy G, Vinker S, Sagi R, et al. Early disaster response in Haiti: the Israeli field hospital experience. Annals of internal medicine. 2010;153(1):45-8.
90.   Burnweit C, Stylianos S. Disaster response in a pediatric field hospital: lessons learned in Haiti. Journal of pediatric surgery. 2011;46(6):1131-9.
91.   Bartels SA, VanRooyen MJ. Medical complications associated with earthquakes. The Lancet. 2012;379(9817):748-57.
92.   De Ville de Goyet C, Grünewald F, Sarmiento JP. Health responses to the earthquake in Haiti January 2010: Lessons to be learned for the next massive sudden-onset disaster. Pan American Health Organization (PAHO); 2011.
93.   Kutcher S, Chehil S, Roberts T. An integrated program to train local health care providers to meet post-disaster mental health needs. Rev Panam Salud Publica. 2005;18(4-5):338-45.
94.   Aitken P, Leggat PA, Robertson AG, Harley H, Speare R, Leclercq MG. Leadership and use of standards by Australian disaster medical assistance teams: Results of a national survey of team members. Prehospital and Disaster Medicine. 2012;27(2):142-7.

Figure 1. QUORUM flow chart of the inclusion/exclusion process

PHASE I
Search of electronic databases: CINAHL, EMBASE, MEDLINE, SSCI and Web of Science, as well as Health Systems Evidence

Records identified through bibliographic databases ($n = 3,161$)

Duplicates removed ($n = 287$)

Records identified through grey literature and hand searches ($n = 30$)

PHASE II
Initial eligibility screen based on titles and Abstracts (by two reviewers)

Titles and abstracts assessed* ($n = 2874$)

Records excluded ($n = 2,801$)

PHASE III
Full-text document assessment for Eligibility (by two reviewers)

Full-text documents * ($n = 73$)

Records excluded ($n = 52$)

Full-text documents assessed * ($n = 30$)

Records excluded ($n = 24$)

PHASE IV
Data extraction and analysis

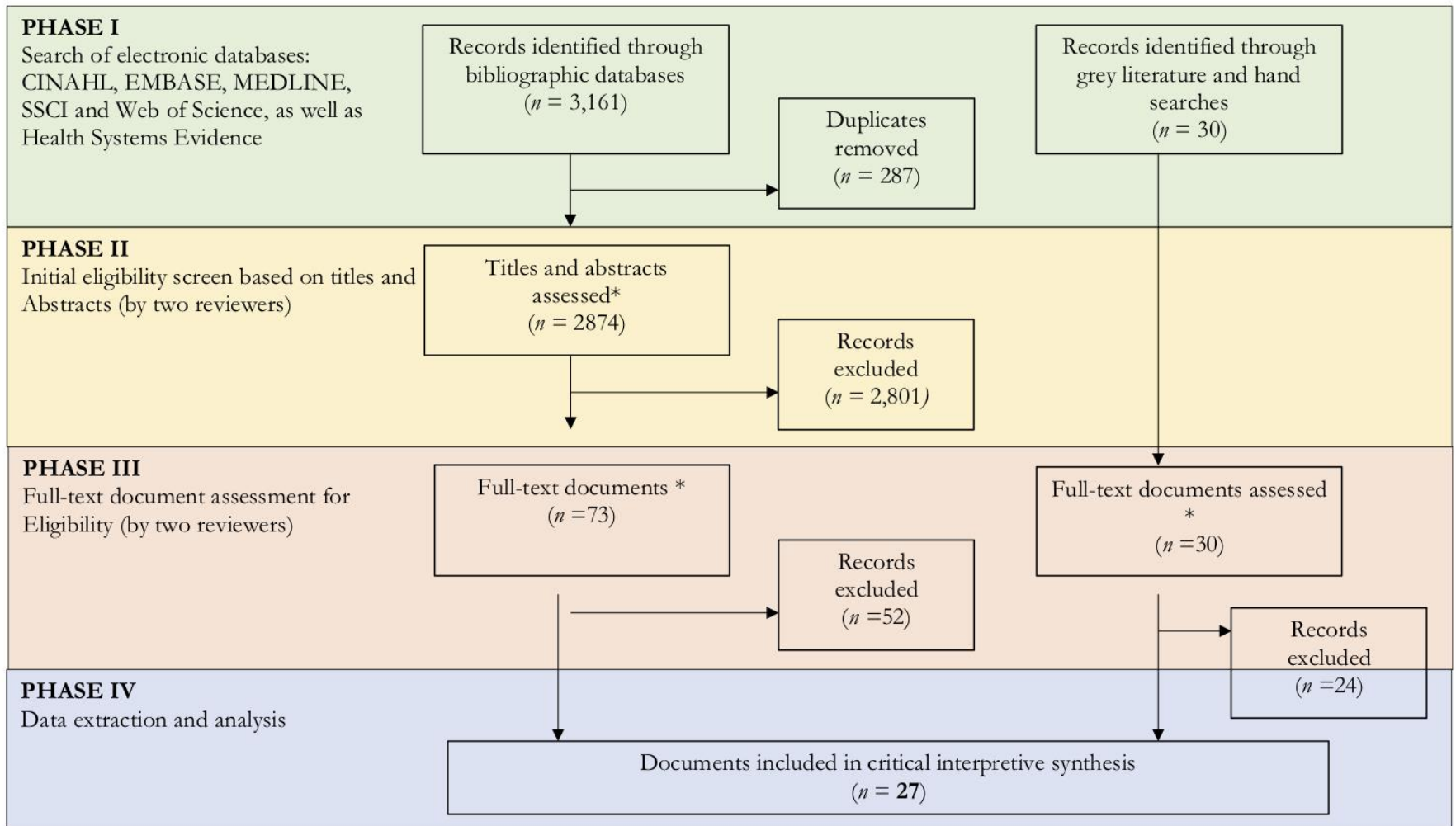Documents included in critical interpretive synthesis ($n = 27$)

Table 1. Characteristics of included studies retrieved in searches and with additional purposive sampling

Year	Country/region of focus	Hazard type	Crisis	Reference
2002	Democratic Republic of Congo	Man-made hazard	Refugee crisis	(19)
2005	Southeast Asia	Natural hazard	Tsunami	(20)
2005	Grenada	Natural hazard	Hurricane	(107)
2008	Southeast Asia & China	Natural hazard	Tsunami, earthquake	(15)
2009	LMIC	Man-made hazard	Armed conflicts	(74)
2010	Southeast Asia	Natural hazard	Tsunami	(84)
2011	LMIC	Man-made and natural hazards	Multiple	(106)
2012	Southeast Asia	Natural hazard	Tsunami	(108)
2012	Peru, Uganda, Nepal	Man-made and natural hazards	Peru: Earthquake, tsunami Uganda: Armed conflict Nepal: Floods, refugee crisis, armed insurgency	(72)
2014	Haiti	Natural hazard	Earthquake	(80)
2014	LMIC	Natural hazard	Earthquakes, fires, and floods	(83)
2014	LMIC	Man-made and natural disasters	Multiple	(64)
2014	LMIC	Man-made and natural disasters	Natural disaster, industrial disaster, chemical/biological/radiological/nuclear, conflict, terrorism, civil disturbance, outbreaks, epidemics, pandemics, major transport accidents, generic, multiple, other	(81)
2014	India	Natural hazard	Earthquakes, drought, cyclone, tsunami	(67)
2015	Southeast Asia	Natural hazard	Tsunami	(16)
2015	India	Natural hazard	Flu pandemic	(82)
2015	Southeast Asia	Natural hazard	Tsunami	(14)
2015	Pakistan & Haiti	Natural hazard	Floods, earthquake	(13)
2015	Zimbabwe	Natural hazard	droughts	(87)
2015	LMIC	Man-made hazard	Tsunami, refugee crisis	(88)
2015	South Africa	Natural hazard	Floods, wildfires, droughts, storm waves	(75)
2016	East Africa	Man-made and natural disasters	Conflict, draught, famine, IDP and refugee crisis	(66)
2016	Nepal	Natural hazard	Lightning strikes, floods, earthquakes and landslides	(79)
2016	South Africa	Natural hazard	Floods, droughts, storm waves and wildfires	(76)
2016	LMIC	Man-made hazard	Fragile and conflict-affected states	(85)
2017	LMIC	Man-made and natural hazards	Armed conflicts and natural disasters	(37)
2017	LMIC	Man-made hazard	Fragile and conflict-affected states	(73)

Figure 2. Strategies and the facilitators (+) of and barriers (-) to support the use of research evidence in crisis zones in different systems
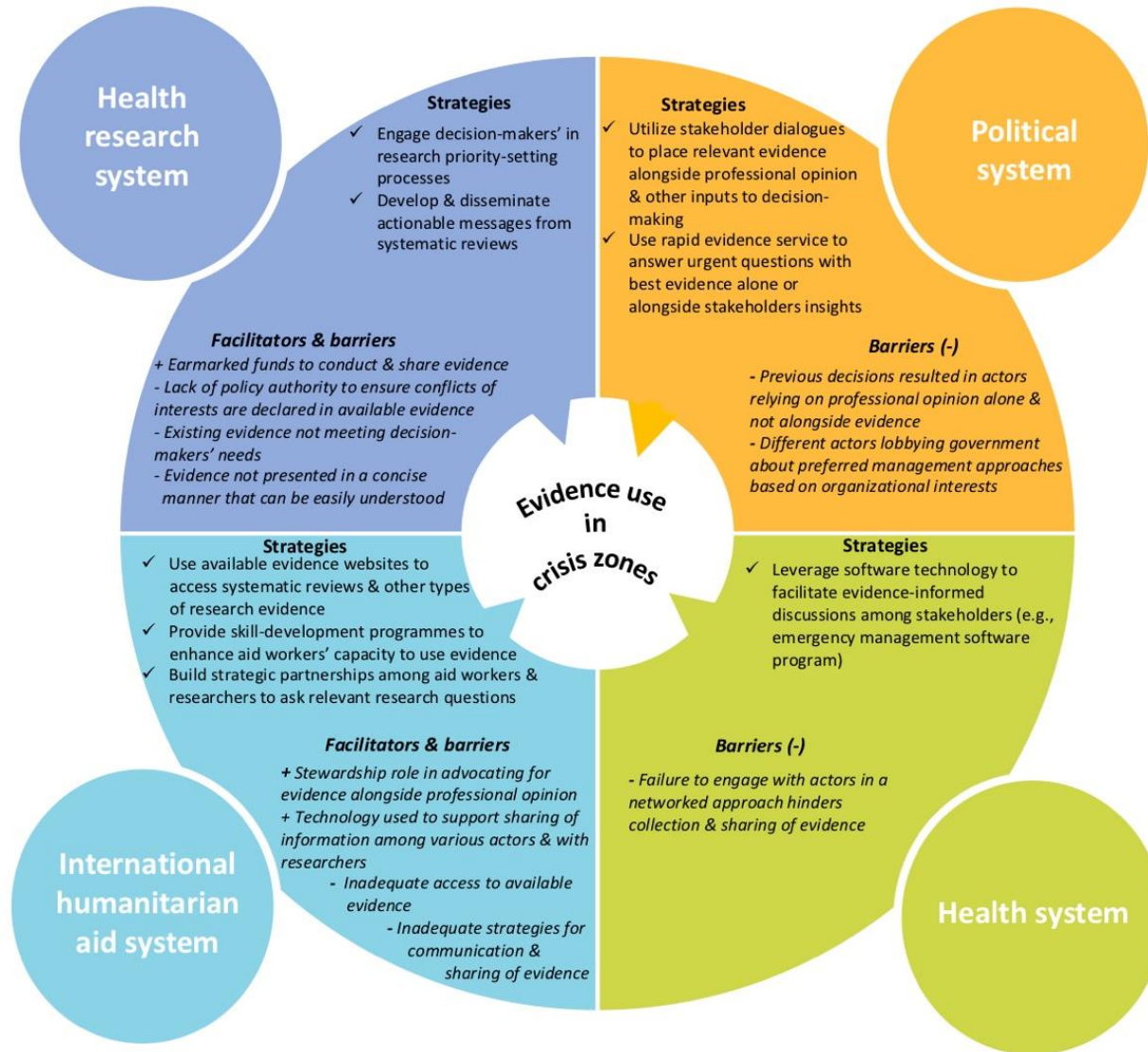
Table 2. Strategies and the facilitators (+) of and barriers (-) to support the use of research evidence in crisis zones in different systems

System & domain		Facilitators (+) of and barriers (-) to research evidence use in crisis zones in LMICs
Political system	**Institutional constraints**	• Policy legacies: **-** Previous decisions based on experience and opinions because of perceived lack of existing research evidence within the national disaster management system resulted in an interpretive effect among the various actors involved in the delivery of humanitarian aid to rely heavily on professional opinion to inform their decision-making instead of also using existing research evidence to clarify a problem, frame options, and address implementation considerations alongside other factors that influence decision-making (19, 64-67)
	Interests	• Societal interest groups: **-** Different actors lobbying government about preferred disaster management approaches based on organizational interests instead of using existing research evidence to clarify a problem, frame options, and address implementation considerations alongside other factors that influence decision-making (65, 66)
		Strategies aimed at policy-makers to support evidence use ✓ Utilize stakeholder dialogues to place relevant evidence alongside professional opinion and other inputs to decision-making (64) ✓ Use rapid evidence service to answer urgent questions with best available evidence alone or alongside stakeholders' insights
Health system	**Governance arrangemen**	• Stakeholder involvement and on what terms: **-** Failure to engage with appropriate groups, in a system that has adopted a networked approach to delegating tasks with humanitarian aid delivery, hinders the collection and sharing of evidence (37, 66, 72-74)
		Strategies aimed at health-system leaders to support evidence use ✓ Leverage software technology to facilitate evidence-informed discussions among stakeholders (e.g., emergency management software program) (77, 78)
International humanitarian system	**Governance arrangement**	• Organizational decisions to support evidence-use: **+** Stewardship role in advocating that existing evidence alongside professional judgement can help inform decision-making about humanitarian responses (19, 37, 64-66, 73, 80, 83, 85)
	Delivery arrangements	• Supports used to assist those receiving evidence: - Inadequate access to available evidence (e.g., requires payment, evidence scattered across reports and journals) (20, 64, 66, 73, 74, 80-84) - Inadequate strategies used for communication and collaboration among aid workers and researchers to understand and address their knowledge needs (65, 66, 73, 80, 83) - Inadequate strategies used to share evidence among multi-institutional humanitarian aid organizations and the network of government level stakeholders (13, 37, 64, 66, 72, 73, 75, 76, 80, 83) **+** Technology, such as social networking capabilities (e.g., Twitter, LinkedIn), is used to support the sharing of information among the various actors involved in the delivery of humanitarian aid and with researchers addressing the knowledge needs of aid workers (64, 66, 80, 83)
		Strategies aimed at humanitarian aid decision-makers to support evidence use ✓ Use available evidence websites to access systematic reviews and other types of research evidence (37, 66, 73, 80, 83, 85)

		✓ Provide skill-development programmes to enhance aid workers capacity to understand and use research studies (13, 37, 72, 73) ✓ Build strategic partnerships among aid workers and researchers to ask relevant research questions (13, 64, 72, 75, 80)
Health research system	**Governance arrangements**	• Policy authority: **-** Lack of policy authority to ensure that all personal, organisational, and political party related conflicts of interest are declared in available research evidence by researchers (64, 72, 84)
	Financial arrangements	• Funds to: **+** Conduct research to fill gaps in existing research evidence in a timely manner (e.g., earmarked funds to conduct research in specific crisis zones to address key knowledge gaps) (19, 20, 37, 66, 73, 74, 85, 106) **+** Share research evidence (e.g., earmarked funds for dissemination of research evidence) (64)
	Delivery arrangements	- Enabling use of evidence: - Existing evidence not meeting decision-makers' needs (e.g. lacks implementations considerations for interventions) (13-16, 37, 64-67, 72, 73, 81, 83-85, 87, 88) - Evidence not presented in a concise manner that can be easily understood by non-technical decision-makers (13, 16, 19, 20, 64-67, 72, 74, 80, 106)
		Strategies aimed at research producers to support evidence use ✓ Engage decision-makers' in research priority-setting processes to develop specific research questions related to humanitarian action in crisis zones (15, 64, 66, 72-74, 80, 83, 85, 92) ✓ Develop and disseminate actionable messages for decision-makers, particularly by research organizations that produce syntheses or systematic reviews (91)

Chapter 3. Preface

This chapter moves away from the broader conceptual understanding of the role of research evidence in decision-making in crisis zones presented in chapter 2, and focuses in part on using the framework to help inform a case study of policy development related to a crisis, focusing in particular on the political system but secondarily on the interplay between the three of the four systems identified in the framework (i.e., political, health, and humanitarian aid systems). This chapter identified two policies as rich potential case studies to examine the use of evidence in humanitarian aid policy decision-making: Lebanon's 2016 Health Response Strategy and Ontario's 2016 Phase 2: Health System Action Plan, Syrian Refugees. The theoretical framework developed in chapter 2, and the 3i+E framework with its three categories of influences on the policy-making process — ideas, interests, and institutions, are used to inform and analyze the findings that help to explain the policy-development process. The chapter provides insight into the influence of political factors in policy processes in crisis zones, which could help inform future policy-development processes.

I conceived the study design with my supervisor, Dr. John N. Lavis, and I was responsible for all data collection and analysis, which took place between August 2018 and April 2019. The members of my supervisory committee each provided feedback on drafts of the chapter, which were incorporated into the paper.

The governmental health policy-development process for Syrian refugees: An embedded qualitative case studies in Lebanon and Ontario

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Abstract:

Background: The unprecedented amount of resources dedicated to humanitarian aid has led many stakeholders to demand the use of reliable evidence in humanitarian aid decisions to ensure that desired impacts are achieved at acceptable costs. However, little is known about the factors that influence the use of research evidence in the policy development in humanitarian crises. We examined how research evidence was used to inform two humanitarian policies made in response to the Syrian refugee crisis.

Methods: We identified two policies as rich potential case studies to examine the use of evidence in humanitarian aid policy decision-making: Lebanon's 2016 Health Response Strategy and Ontario's 2016 Phase 2: Health System Action Plan, Syrian Refugees. To study each, we used an embedded qualitative case study methodology and recruited senior decision-makers, policy advisors, and healthcare providers who were involved with the development of each policy. We reviewed publicly available documents and media articles that spoke to the factors that influence the process. We used the analytic technique of explanation building to understand the factors that influence the use of research evidence in the policy-development process in crisis zones.

Results: We interviewed eight informants working in government and six in international agencies in Lebanon, and two informants working in healthcare provider organizations and two in non-governmental organizations in Ontario, for a total of eighteen key informants. Based on our interviews and documentary analysis, we identified that there was limited use of research evidence and that four broad categories of factors helped to explain the policy-development process for Syrian refugees – development of health

policies without significant chance for derailment from other government bodies (Lebanon) or opposition parties (Ontario) (i.e., facing no veto points), government's engagement with key societal actors to inform the policy-development process, the values underpinning the process, and external factors significantly influencing the policy-development process.

Conclusions: This study suggests that use of research evidence in the policy-development process for Syrian refugees was subordinate to key political factors, resulting in limited influence of research evidence in the development of both the Lebanese and Ontarian policy.

Keywords: health policy, Syrian refugees, case study, Lebanon, Ontario

Background

Globally, there has been an unprecedented amount of resources dedicated to humanitarian aid (1). During a crisis, humanitarian aid often includes the provision of health services, protection, shelter, and food. Using evidence to develop humanitarian aid policy can increase the effectiveness and efficiency of interventions (2-4). However, little is known about the factors that influence the use of research evidence on policy development in humanitarian crisis. A large investment has been made towards ensuring that humanitarian aid is adequately responding to crises and, thus, a deeper understanding of the factors that influence the use of research evidence in the policy-development process is required in order to ensure that this investment is maximized. This deeper understanding could help tailor future policy-development processes so that they may achieve their intended results. We examined how two policy cases were made in response to the Syrian refugee crisis in Lebanon and Ontario.

The Syrian conflict started in the spring of 2011 as a result of a civil war and has caused an estimated 6.6 million people to be displaced within Syria and over 5.6 million refugees seeking safety in Turkey, Lebanon, Jordan, Canada, and beyond. This large exodus of people has placed a strain on host countries' health systems (5). The most prevalent medical problems, which Syrian refugees face, include trauma related mental health disorders, skin, digestive system, and respiratory diseases (6). In addition, many Syrians have chronic health conditions. For instance, 50% of Syrian refugee households in Lebanon report at least one member living with a non-communicable disease (NCD) (7). The management of NCDs requires a long-term approach with often costly and

complex solutions. Along with managing NCDs, the Syrian refugee crisis presents a complex set of issues for policymakers to consider, including dealing with mass causalities and injuries and with infectious-diseases outbreaks (8). This makes it imperative that we use the best available research evidence to inform policy decisions so that money, time, and resources are invested in effective solutions (7, 9, 10). In addition, evidence use in health policy-making ensures that the use of evidence reaches back to populations of concerns in humanitarian settings (11).

What makes decision-making in humanitarian settings unique is the high levels of stress, often in intense and sometimes dangerous situations. Research evidence can help decision-makers respond in a timely manner in such situations. However, the use of research evidence to help respond to crises is not always straightforward. A culture built on immediate action with a traditionally heavy reliance on professional judgement may not be conducive to using evidence to inform decision-making in crisis zones (12). For example, when faced with an unexpected event, decision-makers may draw on their personal experiences to inform their decisions, partly because of a perceived gap in the evidence base on humanitarian action (13-15). In addition, the humanitarian domain can be conflicted on what constitutes evidence because the dividing lines among operational data, theory, and evidence are perceived as unclear. Humanitarian aid organizations may primarily rely on data stemming from their ground operations instead of considering the data alongside existing research evidence.

Policymaking is a highly complex process that requires multiple inputs (e.g., research evidence, common sense knowledge) and can be dependent on the social,

political, and historical context in which it occurs (16-25). An area rarely studied in the health policy literature is how research evidence is used in policy development in crisis zones. We define research evidence as the output of research that has been conducted in a systematic way and reported in a transparent manner. Generally speaking, research evidence can inform policymaking in three ways: instrumental, conceptual, and symbolic (26, 27). These concepts can be applied to policymaking in the Syrian refugee crisis. For example, policymakers may instrumentally use effectiveness and cost-effectiveness studies to decide which drug is best to treat diabetes among the Syrian refugee population. Additionally, policymakers may generally use an overview of reviews of humanitarian-aid interventions to help them to identify broad areas where they may need to give greater or lesser attention. Finally, policymakers may symbolically use evidence when announcing that they will allow nurses in Syrian refugee camps to prescribe diabetes medication because of a shortage of primary-care physicians and only later look to see whether there is research evidence to suggest that nurses can safely and effectively prescribe diabetes medication (26, 27).

This study focuses on examining the factors that influence the use of research evidence in the governmental health policy-development processes in Lebanon and Ontario for two main reasons. First, the role of research evidence in policymaking is often limited (17). Even when research evidence is used by policymakers, such evidence use is often affected by political processes. Studies suggest that policymakers tend to rely on common sense and personal experiences, and that they are concerned with recognition and re-election (22, 24, 25). Second, the real-life context in which policymakers are

developing policies to respond to a crisis has rarely been in the literature (28). For these

two reasons, particular attention needs to paid to how evidence is used in policy

development around humanitarian crises; the case studies of Lebanon and Ontario will

illustrate how this played out in two different contexts.

Methods.

Study design

We used a qualitative embedded case study design. The context of this case study is the host countries response to the Syrian refugee crisis. The case study is bounded by the following timeframe: the 2011 civil war outbreak in Syria, which prompted the refugee crisis, and the release of the key policies in October 2016. In Lebanon, the refugee crisis overlaps with the 2011 conflict in Syria and is still ongoing; however, in Ontario, it was primarily perceived as a crisis in 2015 when the decision was made to accept Syrian refugees. The case studied is the factors that influenced the use of research evidence in health policy-development processes to prepare health systems to respond to an influx of Syrian refugees. The embedded cases consist of recent key policies that host countries have developed to deal with the health of Syrian refugees. Both policies represent the most significant strategy dealing with the health system's response made in the host country in the last four years.

Embedded cases

We included Lebanon and Canada's province of Ontario because they have been among the top jurisdictions taking in registered Syrian refugees since the beginning of the crisis. This ensured that we are examining a country where the crisis has had a significant impact. Additionally, both countries have in place explicit mechanisms to support the use of research evidence in policymaking (e.g., Knowledge to Policy (K2P) center in Lebanon and McMaster Health Forum in Ontario), and where access to the key individuals and the

documents required to conduct a robust case study could be facilitated through our contacts involved with these explicit mechanisms.

Our first embedded case is Lebanon's 2016 Health Response Strategy (HRS). In response to the influx of Syrian refugees in Lebanon and to address the pressures placed on the Lebanese health system, the Ministry of Public Health (MoPH) made the decision to develop a Health Response Strategy (HRS), which was released in 2015 and subsequently updated in October 2016. It served two interdependent strategic objectives: 1) to harness primary, secondary, and tertiary care to address the essential health needs of the displaced Syrians and host community; and 2) to strengthen national institutions and capacities and thereby enhance the resilience of the health system.

The second embedded case is Ontario's Ministry of Health and Long -Term Care (MOHLTC) 2016 Phase 2: Health System Action Plan, Syrian Refugees, which included a set of policies to prepare the province of Ontario for managing the current and future health status of Syrian refugees who moved to the province. It provided guidance on: roles and responsibilities of specific health system partners, general guidance and considerations for Syrian refugee healthcare, and resources available to support continuing Syrian refugee healthcare delivery.

Data sources

We identified and recruited key informants based on their involvement in the development of both embedded cases. These key informants included: 1) senior decision-makers, staff employed by Lebanon's and Ontario's Ministries of Health, international agencies (e.g., UN system organizations), and at non-governmental organizations (e.g.,

Red Cross); 2) policy advisors who helped inform the health policy-development process; and 3) healthcare providers who were involved with the development of the policies. The second stage involved snowball sampling by which research participants in the first stage were asked to identify any additional informants. We reviewed the policy documents to obtain the names of these key informants and communicated with key individuals familiar with the policy-development process to ensure that we found the most appropriate individuals to interview. Given the limited pool of potential participants with knowledge of the policy-development process, we aimed to complete 10 interviews for each country. A total of 18 informants were willing to participate in the interviews across the two settings (Table 1).

In addition to interviewing key informants, we also reviewed publicly available documents and media articles that spoke to the factors that influence the health policy-development process under study. The type of documents included, but were not limited to: governments' and intergovernmental organizations' annual reports and related policy documents (i.e., United Nations High Commissioner for Refugees health access and utilization survey among Syrian refugees in Lebanon), media articles using LexisNexis, transcripts of legislative debates (e.g., Hansard in Ontario), and published literature using PubMed. Google was searched for other document types (e.g., memos, briefs, etc.,) as was the Internet Archive for documents that are no longer available on internet websites (an additional file shows this in more detail [see Additional file 1]).

Data collection methods

We used a semi-structured interview guide that included a number of open-ended

questions, allowing the participant to direct the initial content and flow of the interview

(an additional file shows this in more detail [see Additional file 2]). The 3-I framework, a

political science framework with its three categories of influences on the policy-making

process — ideas, interests, and institutions — was used as a guide to elicit responses

around the political factors that influenced the health policy-development process.

Participants were given the option of phone or in-person interviews. Interviews typically

lasted 30-45 minutes. Each was recorded and transcribed verbatim and the written

transcriptions along with any memos taken throughout the study were used for data

analysis. The language of the interviews was in English, which is a language used by all

of our participants.

For data collection related to the published literature and policy documents on the

policy-development process for Syrian refugees, a search strategy was developed that

incorporated key terms identified in the preliminary analysis of documents and archival

records to develop appropriate electronic search strategies. The search was conducted in

both English and Arabic languages.

Data analysis

The analytic technique of explanation building, which is a type of pattern

matching, was used with the goal of using the case study analyses to build an explanation

about the case (29). It is similar to causal mechanisms in political science, which helps

understand under what conditions these two policies were made. Using an existing

political science theoretical framework, the 3-I framework with its three categories of

influences on the policy-making process — ideas, interests, and institutions (30), helped

to explain the policy-development process (16). The documentary analysis was conducted

to help us develop a timeline of the principal events in the policy-development process

(Figure 1), and to fill in any gaps in our understanding of how the policy-development

process unfolded.

Results

Our results section starts with a brief description of the key informants we interviewed across the two settings to arrive at a comprehensive understanding of the how the policy-development process unfolded. We then describe the principal events that occurred, based on our document review and information provided by our key informants. Our last two sections focus on answering our research objective of examining the factors that influence the use of research evidence in the governmental health policy-development processes for Syrian refugees in Lebanon and Ontario.

Key informants' profiles

Eighteen interviews were completed to understand the policy-development process for Syrian refugees in Lebanon and Ontario (Table 1). For Lebanon, we interviewed all 14 key participants identified by the MoPH as the key individuals involved in the policy-development process. For Ontario, we interviewed all three main refugee health experts identified by the MOHLTC as the only outside-of-government informants involved in the policy-development process. Our fourth informant was identified through snowball sampling. We were unable to interview anyone within the MOHLTC because they declined our request for interview. In light of this decline, we reached out to a contact working at the Local Health Integration Networks (LHINs), who informed us that given the short timeline, the policy was developed entirely within the MOHLTC with consultation from the three external experts we interviewed.

Timeline of principal events

Four key observations can be drawn from the timeline of the principal events in the policy-development process for Syrian refugees (Figure 1). First, Syrian refugees began to arrive in Ontario on November 4, 2015, while in Lebanon Syrian refugees started arriving when the civil war broke out in Syria in 2011. Second, Ontario accepted a total of 10,210 Syrian refugees while Lebanon had over a million registered Syrian refugees and likely many more unregistered refugees at the time of the policy-development process (31, 32). Third, both jurisdictions solicited advice from various societal key players (e.g., NGOs, UN agencies, etc.), through roundtable discussions (Ontario) and the creation of the National Health Steering Committee (Lebanon). Finally, both jurisdictions released the first draft of their respective health policies on December of 2015 and both released the updated version of the policies in October 2016.

Our document analysis indicated that in Lebanon, there were three key knowledge production and translation efforts by the Knowledge to Policy (K2P) Center and by the Center for Systematic Reviews on Health Policy and Systems Research in 2014. First, a priority-setting exercise resulted in the production of systematic reviews to address the health needs of Syrian refugees (33, 34). Second, the production of a briefing note allowed for the contextualizing of global research evidence applied to the Lebanese health system (4). Finally, a policy dialogue arranged and organized by the K2P center and supported by the Ministry of Public Health in Lebanon helped bridge the views, experiences and tacit knowledge of key stakeholders with research evidence (18). Based on the briefing note and policy dialogue, the Lebanese MoPH recruited a refugee health coordinator and a National Health Steering committee to develop the Health Response

Strategy. None of these efforts were identified explicitly during our interviews by our Lebanese key informants.

Research evidence influencing the policy-development process:

There was limited use of research evidence to inform the policy-development process in Lebanon and Ontario. In Lebanon, key informants discussed the scarcity of available research evidence to inform the policy-development process. A senior decision-maker working at MoPH stated:

> *"there were clear gaps in available research evidence. When we found a gap in the evidence we did not commission a study because of concern of funds going to completing studies instead of services when services were severely underfunded. In the context of this emergency, we had to get the data ourselves without having flawless research paper with a perfect methodological method"*

In Ontario, a healthcare provider discussed the scarcity of available research evidence and highlighted that research evidence was mainly used to clarify the health issues of Syrian refugees and not necessarily to inform the policy options and implementation considerations stating:

> *"We had no available literature on what the health conditions of Syrian refugees were. What was really helpful for us on the ground was having a better understanding of the epidemiological conditions in those Syrian refugee populations in Turkey, Lebanon, and Jordan. That required us to look at whatever available evidence we had at the time which included some cross-sectional disease prevalence studies and make policy decisions based on that"*

Information, other than research, informing policymaking

A common finding across our two settings was that both governments drew on inputs from a variety of sources. The scarcity of research evidence led the Lebanese MoPH to rely primarily on data obtained from two main sources: MoPH databases (e.g.,

Maternal Neonatal Mortality Notification System) and reports from other organizations

(e.g., UN Vulnerability Assessment of Syrian Refugees (VASyR)). The data were used in

specific and direct ways to learn about the health needs of, and how to support, Syrian

refugees (i.e., instrumental use of evidence). This highlights the importance for up-to-date

and accessible databases during a crisis. A senior decision-maker commented on the use

of data by the MoPH to inform the policy-development process stating:

> *"the MoPH looked at what data was available in their hospital*
> *observatory system which was providing some quite reliable data and*
> *they had some data from network of primary healthcare and then there*
> *was other data from other studies being done. For example, there was*
> *the VASyR survey led by UNCHR and others that came up with*
> *interesting data on health aspects (e.g., access to healthcare and*
> *disease profile). There was the Hopkins survey looking at access and*
> *disease profile among refugees and host communities"*

A senior decision-maker highlighted how other sources of information (e.g., tacit

and experiential knowledge) were used by the Ontario government to inform the policy-

development process stating:

> *"the information provided is not necessarily evidence-based reports. It*
> *is the expertise and knowledge of the wonderful staff and volunteers*
> *that we are constantly engaged with and interact with and that is the*
> *advantage of being a global organization that we can reach out to*
> *someone that is an Arabic speaking person who can help us better*
> *understand the context"*

Barriers in the use of research evidence in policymaking

There was a degree of consensus across the two settings that some of the main

barriers that resulted in the limited use of research evidence included: short time-frame to

develop the policies, and accessibility to and availability of relevant systematic reviews.

These practical constraints were reported by a senior decision-maker in Lebanon stating:

> *"in a crisis situation, you do not have the time to search for systematic*
> *reviews. Systematic reviews were not always available. The approach*
> *to commission systematic reviews was costly and timely. This is why*
> *data, experience and practice of key stakeholders was more important"*

Overall, our results identified that research evidence was not the main determining factor

influencing the policy-development process for Syrian refugees in Lebanon and Ontario.

Factors influencing the policy-development process:

Table 2 provides a comprehensive list of the full range of likely political factors

that influenced the policy-development process. The four bolded bullet points represent

the most salient factors influencing the policy-development process: institutions

encompassing both government structures and policy networks, ideas encompassing

values about 'what ought to be', and external factors. We elaborate further on those four

points with supporting statements from our key informant interviews

Institutions: Government structures

In Lebanon, the Health Response Strategy effectively faced no opposition because

it fell under the sole jurisdiction of the MoPH National Health Steering committee: a

technical committee headed by the MoPH General Director and comprised of major

international and local partners and focused on informing the policy-development process

(e.g., analysing health needs of Syrian refugees, reviewing MoPH guidelines for health

institutions, and budget allocations). Senior decision-makers commented:

> *"this strategy is produced by the MoPH with the endorsements of all*
> *stakeholders but not from higher authority. This is in comparison to*
> *Lebanon Crisis Response Plan (LCRP) where every single chapter in*
> *that plan had to get approval from every named ministry, in*
> *particular ministry of social affairs who were mandated to coordinate*
> *between all ministries to develop the plan. This leads to a lot of*

political factors playing a role in hindering the policy-development process"

Similarly, Ontario's first-past-the-post electoral system meant that a majority Liberal government, elected in 2014, was able to act on the Liberal Federal government priorities of accepting Syrian refugees without significant chance for derailment from opposition parties (i.e., it faced no veto points). A senior decision-maker highlighted the Liberal Federal government decisions about welcoming Syrian refugees by stating:

> *"The fact that the* [Federal] *government was favorable got the ball rolling in a very significant way. When the Trudeau government was elected, the policy of the Liberal government, which was to open doors and receive people in need, meant that for us (i.e., senior decision-makers in Ontario) we can start the dialogue about how to best help the federal government get there"*

It is significant to highlight that the Ontario policy was supported by federally legislated funding attached to demarcated priorities for refugee health and the Lebanese policy was a bureaucratic exercise without elected official oversight. This meant that gathering support for the policies was not particularly challenging.

Institutions: Policy networks

Second, both jurisdictions relied on policy networks to inform the policy-development process. In Lebanon, the MoPH convened the National Health Steering committee for the purpose of informing the policy-development process. A senior decision-maker at the MoPH described the role of the National Health Steering committee stating:

> *"the National Health Steering committee was designed to get all the buy-ins, everyone on board, to make sure we did not miss on anything in the field. The point of the committee was to get all the perspectives on the table. It was mostly made up of the EU delegation, the World*

*Bank, the big UN agencies all at the same table. The point was to
have an open and honest conversation about the whole process, how
to get money, and where it should go"*

In Ontario, the Liberal government convened round-table discussions with key

societal actors (e.g., Canadian Red Cross, Canadian Centre for Refugee and Immigrant

Healthcare, and Crossroads Clinic for Refugees). These round-table discussions played a

crucial role in the policy-development process as stated by a senior decision-maker:

> *"one of the biggest takeaways was having key stakeholders from all
> different areas (not just the Ministry) but the key external stakeholders
> like Canadian Centre for Refugee and Immigrant Healthcare,
> Crossroads Clinic for Refugees, Canadian Red Cross (CRC) present at
> the same table was very important and very influential because what
> that brought to the entire planning exercise was the fact that because
> CRC was so involved in the community sector we were able to create
> those linkages"*

For Lebanon and Ontario, having direct contact and interactions with key stakeholders

from various organizational affiliations played an instrumental role in the policy-

development process.

Ideas: Values about 'what ought to be'

The Lebanese values of providing safety for displaced people underpinned the

Health Response Strategy with one senior decision-maker stating:

> *"what propelled the policy-development process was the safety of the*
>
> *vulnerable people"*

Similarly, the Syrian refugee crisis spoke to Ontarians values, such as inclusion and

fairness, which underpinned the policy-development process. A healthcare provider,

involved in informing the policy-development process, reaffirmed this by stating:

> *"this* [Ontario's Health System Action Plan] *was made for a host of reasons, one of which to restore the soul of the nation. A nation defined where everybody has recently been touched by the refugee and immigrant experience, where by definition everybody is from somewhere else"*

A senior decision-maker highlighted the willingness of Ontarians to help displaced Syrians by stating:

> *"everybody had the best intent of ensuring that the refugees are welcomed and received and healthy and are able to be supported in the best possible way"*

External factors

In Lebanon, international donors played an important role in influencing the policy-development process. Given the protracted nature of the Syrian refugee crisis in Lebanon, the policy-development process was seen as a way to mobilize increased funding from international donors (e.g., the European Union), and to align funding to targeted priorities (e.g., maternal and child health). A senior decision-maker highlighted the influence of international donors on the policy-development process, stating:

> **"***the National Health Steering committee, included major donors particularly the European Union, that was very engaged. The strategy worked both ways: mobilize more funding from international donors but also some of the donors committed to certain projects, like maternal and child health, which ended up shaping the strategy"*

Our document analysis indicated that media coverage played a significant role in the policy-development process for Syrian refugees in Ontario. The photo of Alan Kurdi, a three-year-old Syrian boy who drowned on 2 September 2015 in the Mediterranean Sea when his family was escaping Syria into Europe, became a focusing event among

Ontarians and the governing Ontario Liberal party that accelerated the policy-development process (35, 36).

Discussion

Our study provided a deeper understanding of the factors that influence the policy-development process in crisis zones and the role of research evidence in the process. This study identified four broad factors that help to explain the overall policy-development for Syrian refugees in Lebanon and Ontario: development of health policies without significant chance for derailment from other government bodies (Lebanon) or opposition parties (Ontario) (i.e., facing no veto points), government's engagement with key societal actors to inform the policy-development process, the embedded values underpinning the process, and external factors significantly influencing the policy-development process. These different factors provide insight into the influence of political factors in policy processes in crisis zones, which could help inform future policy-development processes.

Our study found that policymakers in Lebanon and Ontario voiced similar challenges with navigating the gaps in available research evidence to inform the policy options and implementation considerations relevant to the policy-development process (e.g., reviews about strategies that should be considered in order to facilitate the necessary system changes). Policymakers raised the issue of inadequate access to systematic reviews in a short-time frame. It is a surprising finding that although evidence websites are available to support this particular issue, they were not brought forward to policymakers as a source for accessing information and/or perceived as helpful (e.g., given the potentially limited applicability of the evidence, and the format of findings from systematic reviews) (37).

In Lebanon, our documentary analysis revealed that there were multiple efforts to support the use of research evidence in the policy-development process (e.g., systematic reviews syntheses, briefing note and policy dialogue), with none of our participants referencing such efforts in our interviews for two possible reasons. First, this could be a result of our informants' recollection of activities that occurred in 2014, during interviews conducted in 2018. Second, a case study has shown that although the use of knowledge translation strategies in Lebanon helps to generate evidence-informed policymaking, there is still a need to better link those knowledge translation strategies to specific policy-development processes (38). For example, an evaluation component should be integrated into the knowledge translation strategy from the start to allow for easier identification of whether and how research evidence was used to inform the policy-development process (38). This contributes to our understanding on the need for further evaluations that measure the impact of explicit strategies to support evidence-informed policymaking (18, 19).

Findings in relation to other studies

Our finding show that Lebanon's and Ontario's governments shared similar challenges in the perceived scarcity of available research evidence to inform the policy development for Syrian refugees aligns with previous studies identifying that there are perceived gaps in the research evidence to inform policy development about humanitarian crises (13, 16, 39-43). This study also aligns with other studies that focused on information other than research evidence greatly influencing the policy-development process (16). In understanding the factors that influence the policy-development process,

this study aligns with other studies that suggest how the lack of veto points can support the policy-development process (22, 44-49), policy networks can inform the policy-development process (24, 50-52), values about 'what ought to be' can underpin the policy-development process (16, 18), and external factors can be a catalyst of action (53, 54).

Strengths and limitations

There are four strengths to this study. First, this is the first study to address the knowledge gap in our understanding of the policy-development process for Syrian refugees on two health systems – those of Lebanon and Ontario – operating in very different contexts. Second, the embedded case study design allowed for cross-case analysis thereby providing an in-depth analysis of the factors that influence the policy-development process for Syrian refugees in Lebanon and Ontario and the role of research evidence in the process. Third, we interviewed diverse types of decision-makers encompassing various organizational affiliations to arrive at a comprehensive story of how the policy-development process for Syrian refugees unfolded. Finally, the use of an existing theoretical framework, the only one that provides a comprehensive inventory of the full range of likely political factors, was used to explain the policy-development process for Syrian refugees in Lebanon and Ontario.

One significant challenge to this study related to recruitment of key informants from Ontario's MOHLTC. Initially there was interest by decision-makers at the MOHLTC to participate in our study with the caveat of waiting until the newly elected government took office. However, after the change of government, we were informed that

our request for interviews was declined. We took the following step to address this challenge: we interviewed other key informants who were identified through documentary analysis and by the MOHLTC as actors who were directly involved in the policy-development process.

Another limitation to this study is that the retrieval of media articles in Lebanon was challenging as many of the articles were archived and difficult to access. We addressed this limitation by soliciting the help of a specialized communication officer, who provided us with newspapers articles retrieved from a press tracing exercise conducted on Syrian refugees.

Implications for policy and practice

The results of our study carry with them some implications. First, this study suggests that other types of information — if not always research evidence — can play an instrumental role in answering specific and direct questions in policy development (e.g., tacit and experiential knowledge used to learn about how best to provide linguistic and culturally appropriate services for Syrian refugees), however, when it comes to a large-scale decision (i.e., addressing health needs of Syrian refugees) other factors are more salient such as the lack of institutional constraints such as veto points. Second, given policymakers' perception of the scarcity of available research evidence to inform policy development, policymakers not utilizing available evidence websites, and policymakers' reliance on key stakeholders to share their knowledge and expertise reaffirms the importance for networks to be in place to coordinate and share quality and timely evidence with all stakeholders. For example, EVIPNet is a network established by the

World Health Organization to promote the systematic use of data and research evidence in health policymaking by providing key outputs, such as national clearing houses, that aim at providing an opportunity for sharing evidence among all stakeholders (55). EVIPNet is just one example of the different networks that exist to help policymakers better use research evidence.

Future research

Our methodology of using an existing theoretical framework, the diversity in our types of decision-makers and organizational affiliation, and key findings on supporting the use of evidence in policy development can be used by researchers studying the policy-development process for Syrian refugees in other host communities (e.g., Turkey, Jordan) and to design and evaluate an intervention to support evidence use in these communities.

Conclusions

This study suggests that use of research evidence in the policy-development process for Syrian refugees was subordinate to key political factors, resulting in limited influence of research evidence in the development of both the Lebanese and Ontarian policy. This study highlights the need for interested and committed policymakers who value the role of research evidence in informing policymaking.

List of abbreviations

LHINs: Local Health Integration Networks; NCD: non-communicable disease; HRS: Health Response Strategy; MOHLTC: Ministry of Health and Long-Term Care; MoPH: Ministry of Public Health; NHSC: National Health Steering Committee; K2P: Knowledge

to Policy; CRC: Canadian Red Cross; LCRP: Lebanon Crisis Response Plan; VASyR:

Vulnerability Assessment of Syrian Refugees

Declarations

Ethical approval and consent to participate

Ethical approval was obtained from the McMaster University through the Hamilton

Integrated Research Ethics Board (HiREB), Project #4723: and in Lebanon through the

Human Research Protection Program (HRPP) at the American University of Beirut,

Project IRB ID: SBS-2018-0275. We obtained written consent from all participants.

Consent for publication

Not applicable.

Availability of data and material

All data generated or analysed during this study are included in this published article [and

its supplementary information files]

Competing interests

All authors declare that they have no competing interests.

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Authors' contributions

AFK conceived, collected the data, and drafted the manuscript. All authors participated in

the design of the study, analysis of the data, and provided comments on drafts of the

manuscript. All authors read and approved the final manuscript.

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References

1.   Mahmood J, Ngom M, Delargy P, Tambashe B, Jongstra E, Oussein S. Guidelines on Data Issues in Humanitarian Crisis Situations. New York, UNFPA; 2010.
2.   Blanchet K, Roberts B, Sistenich V, Ramesh A, Frison S, Warren E, et al. An evidence review of research on health interventions in humanitarian crises. Final Report. 2013.
3.   Grais RF, Strebel P, Mala P, Watson J, Nandy R, Gayer M. Measles vaccination in humanitarian emergencies: a review of recent practice. Conflict and health. 2011;5(1):21.
4.   El-Jardali F, Hammoud R, Fouad F, Bou Karoum L. K2P Briefing Note: Promoting Access to Essential Health Care Services for Syrian Refugees in Lebanon. Knowledge to Policy (K2P) Center Beirut, Lebanon. 2014:6.
5.   Ostrand N. The Syrian refugee crisis: A comparison of responses by Germany, Sweden, the United Kingdom, and the United States. Journal on Migration and Human Security. 2015;3(3):255-79.
6.   Saleh A, Aydın S, Koçak O. A comparative Study of Syrian Refugees in Turkey, Lebanon, and Jordan: Healthcare Access and Delivery. OPUS Uluslararası Toplum Araştırmaları Dergisi. 2018;8(14):448-64.
7.   Rehr M, Shoaib M, Ellithy S, Okour S, Ariti C, Ait-Bouziad I, et al. Prevalence of non-communicable diseases and access to care among non-camp Syrian refugees in northern Jordan. Conflict and health. 2018;12(1):33.
8.   Refaat MM, Mohanna K. Syrian refugees in Lebanon: facts and solutions. The Lancet. 2013;382(9894):763-4.
9.   Response SCfH. The Sphere Project: Humanitarian charter and minimum standards disaster response. Mc Connan (ed) Geneva; 1998.
10.   Perone SA, Martinez E, du Mortier S, Rossi R, Pahud M, Urbaniak V, et al. Non-communicable diseases in humanitarian settings: ten essential questions. Conflict and Health. 2017;11(1):17.
11.   Parkhurst J. The politics of evidence: from evidence-based policy to the good governance of evidence: Routledge; 2017.
12.   Blanchet K, Allen C, Breckon J, Davies P, Duclos D, Jansen J, et al. Research Evidence in the Humanitarian Sector: A Practice Guide. 2018.
13.   Lavis J, Davies H, Oxman A, Denis J-L, Golden-Biddle K, Ferlie E. Towards systematic reviews that inform health care management and policy-making. Journal of health services research & policy. 2005;10(1_suppl):35-48.
14.   Dobbins M, DeCorby K, Twiddy T. A knowledge transfer strategy for public health decision makers. Worldviews on Evidence-Based Nursing. 2004;1(2):120-8.
15.   Boyko JA, Lavis JN, Abelson J, Dobbins M, Carter N. Deliberative dialogues as a mechanism for knowledge translation and exchange in health systems decision-making. Social Science & Medicine. 2012;75(11):1938-45.
16.   Lavis JN, Ross SE, Hurley JE. Examining the role of health services research in public policymaking. The Milbank Quarterly. 2002;80(1):125-54.

17.   Jewell CJ, Bero LA. "Developing good taste in evidence": facilitators of and hindrances to evidence-informed health policymaking in state government. The Milbank Quarterly. 2008;86(2):177-208.

18.   Lavis JN, Boyko JA, Oxman AD, Lewin S, Fretheim A. SUPPORT Tools for evidence-informed health Policymaking (STP) 14: Organising and using policy dialogues to support evidence-informed policymaking. Health Research Policy and Systems. 2009;7(1):S14.

19.   Oxman AD, Lavis JN, Fretheim A, Lewin S. SUPPORT Tools for evidence-informed health Policymaking (STP) 17: Dealing with insufficient research evidence. Health Res Policy Syst. 2009;7(1):S17.

20.   Coburn AF. The Role Of Health Services Research In Developing State Health Policy: States' growing participation in health policy making has motivated new partnerships with academe. How can states make the most of these schemes? Health Affairs. 1998;17(1):139-51.

21.   Sorian R, Baugh T. Power of information: closing the gap between research and policy. Health Affairs. 2002;21(2):264-73.

22.   Baumgartner FR, Green-Pedersen C, Jones BD. Comparative studies of policy agendas. Journal of European Public Policy. 2006;13(7):959-74.

23.   Stone DA. Policy paradox: The art of political decision making: ww Norton New York; 1997.

24.   Stone D. Capturing the political imagination: Think tanks and the policy process: Routledge; 2013.

25.   Lindblom CE, Cohen DK. Usable knowledge: Social science and social problem solving: Yale University Press; 1979.

26.   Pelz DC. Some expanded perspectives on use of social science in public policy. Major social issues: A multidisciplinary view. 1978:346-57.

27.   JN L. Finding and using research evidence: summary sheet. In: Forum MH, editor. 2017.

28.   Martineau T, McPake B, Theobald S, Raven J, Ensor T, Fustukian S, et al. Leaving no one behind: lessons on rebuilding health systems in conflict-and crisis-affected states. BMJ global health. 2017;2(2):e000327.

29.   Yin RK. Basic types of designs for case studies. Case study research: Design and methods 5th ed. Thousand Oaks: Sage Publications; 2014.

30.   Hall PA. The role of interests, institutions, and ideas in the comparative political economy of the industrialized nations. Comparative politics: Rationality, culture, and structure. 1997:174-207.

31.   Refugees TOotUNHCf. Syria Regional Refugee Response [Operational Portal: refugee situations]. UNHCR.org: UNHCR; 2018 [updated 31 December 2018. Available from: https://data2.unhcr.org/en/situations/syria/location/71.

32.   Canada Go. Syrian Refugees Family Composition – Ad Hoc IRCC (Specialized Datasets) [Datasets]. Govenrment of Canada Website: Govenrment of Canada; 2019 [Available from: https://open.canada.ca/data/en/dataset/ca243c40-a6d3-4a46-a578-b4fad4369df0.

33.   Akl EA, El-Jardali F, Karroum LB, El-Eid J, Brax H, Akik C, et al. Effectiveness of mechanisms and models of coordination between organizations, agencies and bodies providing or financing health services in humanitarian crises: a systematic review. PloS one. 2015;10(9):e0137159.

34.   Lotfi T, Bou-Karroum L, Darzi A, Hajjar R, El Rahyel A, El Eid J, et al. Coordinating the Provision of Health Services in Humanitarian Crises: a Systematic Review of Suggested Models. PLoS currents. 2016;8.

35.   Pammett JH, Dornan C. The Canadian Federal Election of 2015: Dundurn; 2016.

36.   Hadfield A. Maple Leaf Zeitgeist? Assessing Canadian Prime Minister Justin Trudeau's Policy Changes. The Round Table. 2017;106(1):23-35.

37.   Mellon D. Evaluating Evidence Aid as a complex, multicomponent knowledge translation intervention. Journal of evidence-based medicine. 2015;8(1):25-30.

38.   Yehia F, El Jardali F. Applying knowledge translation tools to inform policy: the case of mental health in Lebanon. Health research policy and systems. 2015;13(1):29.

39.   Oxman AD, Lavis JN, Fretheim A. Use of evidence in WHO recommendations. The Lancet. 2007;369(9576):1883-9.

40.   Innvær S, Vist G, Trommald M, Oxman A. Health policy-makers' perceptions of their use of evidence: a systematic review. Journal of health services research & policy. 2002;7(4):239-44.

41.   Blanchet K, Ramesh A, Frison S, Warren E, Hossain M, Smith J, et al. Evidence on public health interventions in humanitarian crises. The Lancet. 2017.

42.   Ager A, Burnham G, Checchi F, Gayer M, Grais RF, Henkens M, et al. Strengthening the evidence base for health programming in humanitarian crises. Science. 2014;345(6202):1290-2.

43.   Bradt DA. Evidence-based decision-making in humanitarian assistance. HPN Network Paper-Humanitarian Practice Network, Overseas Development Institute. 2009(67).

44.   Weible CM, Heikkila T, Sabatier PA. Understanding and influencing the policy process. Policy Sciences. 2012;45(1):1-21.

45.   Immergut EM. Institutions, veto points, and policy results: A comparative analysis of health care. Journal of Public policy. 1990;10(4):391-416.

46.   Sparkes SP, Bump JB, Reich MR. Political strategies for health reform in Turkey: Extending veto point theory. Health Systems & Reform. 2015;1(4):263-75.

47.   Béland D. Ideas, institutions, and policy change. Journal of European public policy. 2009;16(5):701-18.

48.   Liverani M, Hawkins B, Parkhurst JO. Political and institutional influences on the use of evidence in public health policy. A systematic review. PloS one. 2013;8(10):e77404.

49.   Smith N, Mitton C, Davidson A, Williams I. A politics of priority setting: Ideas, interests and institutions in healthcare resource allocation. Public Policy and Administration. 2014;29(4):331-47.

50.   Koon AD, Rao KD, Tran NT, Ghaffar A. Embedding health policy and systems research into decision-making processes in low-and middle-income countries. Health research policy and systems. 2013;11(1):30.

51.	Walt G, Shiffman J, Schneider H, Murray SF, Brugha R, Gilson L. 'Doing'health policy analysis: methodological and conceptual reflections and challenges. Health policy and planning. 2008;23(5):308-17.
52.	Shearer JC, Abelson J, Kouyaté B, Lavis JN, Walt G. Why do policies change? Institutions, interests, ideas and networks in three cases of policy reform. Health policy and planning. 2016;31(9):1200-11.
53.	Zardo P, Collie A, Livingstone C. External factors affecting decision-making and use of evidence in an Australian public health policy environment. Social Science & Medicine. 2014;108:120-7.
54.	Watson DE, Barer ML, Matkovich HM, Gagnon ML. Wait time benchmarks, research evidence and the knowledge translation process. Healthcare Policy. 2007;2(3):56.
55.	Lavis JN, Panisset U. EVIPNet Africa's first series of policy briefs to support evidence-informed policymaking. International Journal of Technology Assessment in Health Care. 2010;26(2):229-32.

Table 1. Characteristics of key informants interviewed to understand the policy-development process

Policy	% (n)	Key informant position	Organizational affiliations	Organizational types
Health Response Strategy	78% (*n=14*)	Senior decision-maker (*n=13*) Policy advisor (*n=1*)	Ministry of Public Health United Nations United Nations High Commissioner for Refugees United Nations International Children's Emergency Fund World Health Organization	Government agency (*n=8*) International agencies (*n=6*)
Phase 2 Ontario Health System Action Plan: Syrian Refugees	22% (*n=4*)	Healthcare provider (*n=2*) Senior decision-maker (*n=2*)	Canadian Centre for Refugee & Immigrant HealthCare Canadian Red Cross Crossroads Clinic for Refugees	Healthcare provider (*n=2*) NGO (*n=2*)

This table should appear on page 9 under ''Key informants' profiles''

Figure 1. Timeline of the principal events in the policy-development process for Syrian refugee
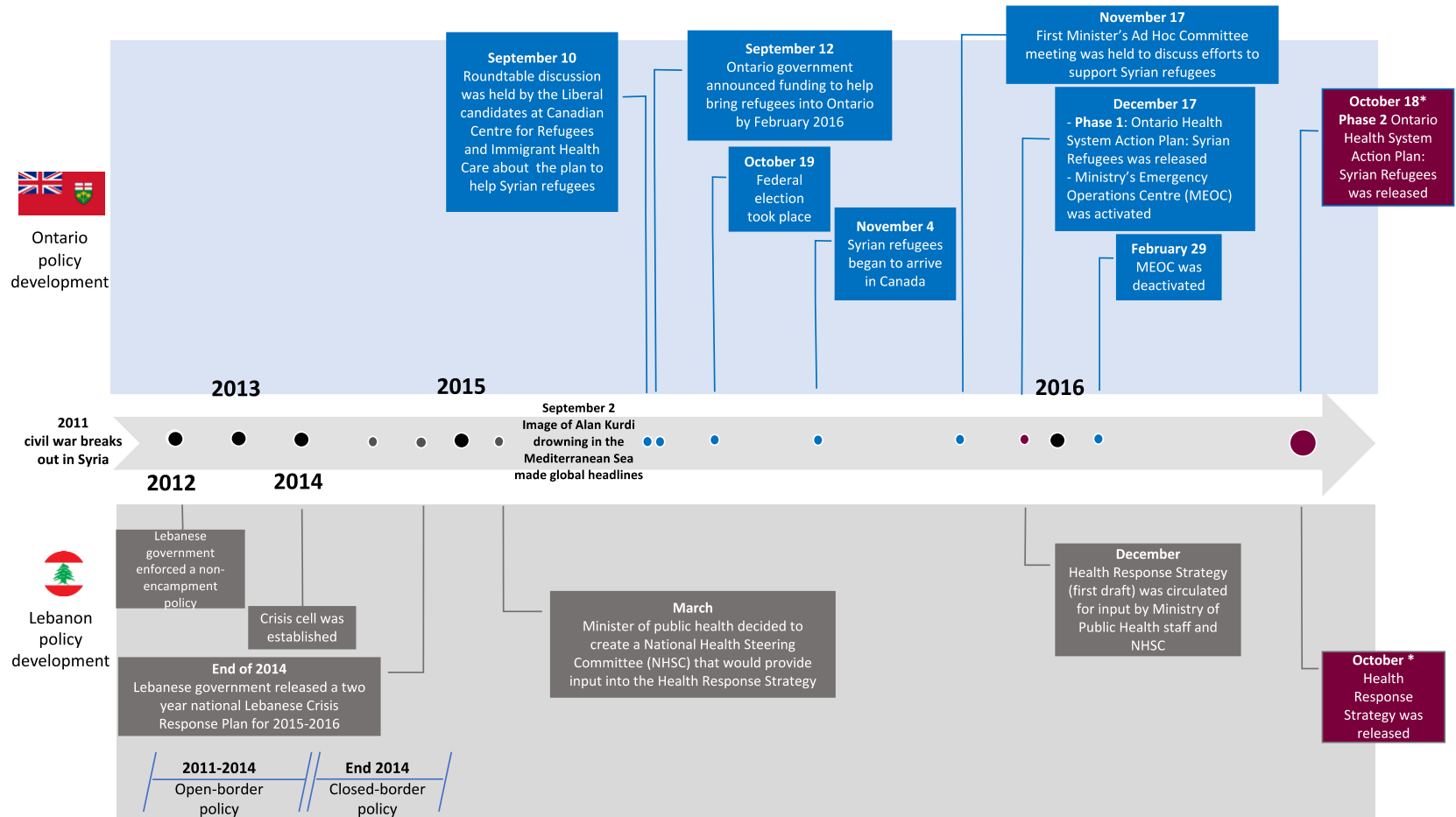
This figure should appear on page 11 under "Timeline of principal events"

Table 2. Summary of factors playing a role in policy-development process for Syrian refugees

Factor		Policy: Lebanon's Health Response Strategy (2016)	Policy: Phase 2 of Ontario's Health System Action Plan (2016)
Policy development	Institutions	**Government structures** • The Health Response Strategy fell under the sole jurisdiction of the MoPH because of is technical nature (e.g., analysis of health needs, MoPH guidelines for health institutions, budget allocations), which meant that it effectively faced no opposition in decisions about supporting Syrian refugees **Policy networks** • MoPH convened a National Health Steering Committee, that comprised of major international and local partners, to inform the policy-development process Policy legacies • Past Palestinian refugee camp policies resulted in an interpretive effect among the Lebanese where by camps were perceived as sources of insecurity, radicalisation and armed groups, and as places to be avoided. In order to avoid these problems, Syrian refugees have been integrated into communities; however, this has placed a strain on the health system, necessitating this strategy to help address their health needs	**Government structures** • Ontario's first-past-the-post system meant that a majority Liberal government, elected in 2014, was able to act on the federal Liberal government priorities of accepting Syrian refugees without significant chance for derailment from opposition parties (i.e., it faced no veto points) **Policy networks** • Liberal government convened round-table discussions with key societal actors (e.g., Canadian Red Cross, Canadian Centre for Refugee and Immigrant Healthcare, and Crossroads Clinic for Refugees) to inform the policy-development process Policy legacies • Past restrictive Federal government Conservative Party immigration policies resulted in an interpretive effect among Ontarians that a more balanced immigration policy was needed for vulnerable refugees in need of assistance, especially given Canada is comprised of many immigrants who immigrated to Canada in search of a better life
	Interests	Societal interest groups • Some actors drew on their practical experiences in Syria and in Lebanon to lobby government about their preferred approaches to addressing the health needs of Syrian refugees	Societal interest groups • Some actors drew on their practical experiences in Syria and in Canada to lobby government about their preferred approaches to addressing the health needs of Syrian refugees

Factor	Policy: Lebanon's Health Response Strategy (2016)	Policy: Phase 2 of Ontario's Health System Action Plan (2016)
Ideas	**Values about 'what ought to be'** • Lebanese values of providing safety for displaced people underpinned the policy-development process Knowledge/beliefs about 'what is' The government drew on inputs from a variety of sources, many of which were informed by research evidence and other types of information, such as • Lessons were drawn about how to prevent and manage future infectious disease outbreaks among Syrian refugees from prior management of measles, hepatitis A, and Leishmaniasis disease outbreaks in 2015 • Data was obtained from two main sources: first, MoPH databases (e.g., Maternal Neonatal Mortality Notification System) that included data on service utilization, human resources, immunization coverage, and disease prevalence related to displaced Syrians. Second, reports from other organizations (e.g., Johns Hopkins' Syrian refugee's health access survey (2015), UN Vulnerability Assessment of Syrian Refugees, and World Bank assessments) about the health needs of Syrian refugees (e.g., access to PHC services, etc.) • Analysis of NGOs' funding initiatives demonstrated that 45% of donor funds were spent on organizational overhead costs, prompting the policy-development process to appropriately align funds and human resources and reduce overhead costs • Information from the Lebanon crisis response plan (2015-2016) helped inform sections of the Health Response Strategy (e.g., Primary healthcare (PHC) budget that included funds allocated to support mental health needs of Syrian refugees, etc.) • Tacit and experiential knowledge obtained from addressing health needs of the Palestinian refugees	**Values about 'what ought to be'** • Ontarians values such as inclusion and fairness underpinned the policy-development process Knowledge/beliefs about 'what is' The Ontario government drew on inputs from a variety of sources, many of which were informed by research evidence and other types of information, such as • Lessons were drawn about how to manage the health needs of Syrian refugees 'within routine practices' from the implementation of Phase 1 Ontario's Health System Action Plan (2015) that primarily focused on addressing the health needs of Syrian refugees upon arrival in Ontario (e.g., primary-care provision at Toronto Pearson International Airport, which acted as the point-of-entry for refugees) • Existing research evidence were drawn that included cross-sectional disease prevalence studies among Syrian refugees in other contexts (e.g., Jordan, Lebanon, Turkey), Canadian-adapted Sphere emergency social-services guidelines about shelter and about transportation to healthcare facilities, and medical guidelines from 'on the ground' organizations (e.g., at Médecins Sans Frontières, United Nations High Commissioner for Refugees) • Tacit and experiential knowledge obtained through direct contact with field personnel in Jordan and Syria was used in specific and direct ways to learn about health needs and how best to provide linguistic services (e.g., Arabic interpretations) and culturally appropriate services (e.g., dietary needs) • Data about the humanitarian response plans inside of Syria was obtained from reports from other organizations (e.g., International Organization for Migration) • Insights on culturally appropriate ways of providing healthcare was obtained from conversations with newly arrived Syrian refugees

Factor	Policy: Lebanon's Health Response Strategy (2016)	Policy: Phase 2 of Ontario's Health System Action Plan (2016)
External factors	**International donors** • International donors (e.g., the European Union) fuck (e.g., maternal & child health) influenced the focus of the strategy. The policy-development process was intended to increase and align donor funds to specific health outcomes	**Media coverage** • Photo of Alan Kurdi, a three-year-old Syrian boy who drowned on 2 September 2015 in the Mediterranean Sea when his family was escaping Syria into Europe, became a focusing event among Ontarians and the governing Ontario Liberal party that accelerated the policy-development process

This table should appear on page 10 under "Factors influencing the policy-development process"

Additional file 1

Appendix 1. Data collection and sampling for media, published literature and policy documents

Policy	Data source	Search terms and date of search	Included
Lebanon's Health Response Strategy	Published literature-CINAHL EMBASE MEDLINE (PubMed) SSCI Web of Science	Terms: "Health polic*" AND "Leban*" AND ("Syria*" OR "refugee*") Date: October 15, 2018	6 (of 120 studies retrieved) (27, 28, 32, 44, 51, 52)
	Gray literature (e.g., policy documents)	Identified through: 1) Key informant interviews 2) Hand searches of reference lists 3) Google searches	16 policy documents
	Debates of the Lebanese parliament, laws, ministerial decisions, decrees	Terms: "Syria*" AND *refugee* Date: November 2, 2018	13 (of 6214 references about Syrian refugees in retrieved sessions)
	Newspapers articles retrieved from press tracing exercise	Terms: "refugee" AND "Leban*" Date: October 16, 2018	440 (of 770 individual articles retrieved)
Phase 2 Ontario Health System Action Plan: Syrian Refugees	Published literature-CINAHL EMBASE MEDLINE (PubMed) SSCI Web of Science	Terms: "Health polic*" AND "Canada*" AND ("Syria*" OR "refugee*") Date: June 28, 2018	3 (of 363 studies retrieved) (29, 30, 50)
	Gray literature (e.g., policy documents)	Identified through: 1) Key informant interviews 2) Hand searches of reference lists 3) Google searches	8 policy documents
	Hansard: debates of the *Legislative Assembly of Ontario*	Terms: syria*refugee* Date: June 28, 2018	6 (of 44 references about Syrian refugees in retrieved sessions)
	Newspapers articles – Lexis Nexis database	Terms: "Syria*" AND "Canad*" AND "health*" Date: June 28, 2018	5 (of 1043 individual articles retrieved)

Additional file 2

Appendix 2. Interview guide

Introduction

Hello, my name is X and I want to thank you for taking your time to meet with me today. My study examines the role of research evidence in the health policy-development stage process for [insert policy].
   ✓ Denotes probes/prompts

A. General Questions:
1. Do you have any questions for me before proceeding with the interview?
2. Which of the following best describes your role in relation to the development of health policies for Syrian refugees:
   ✓ policy maker
   ✓ manager
   ✓ researcher
   ✓ healthcare provider
   ✓ Syrian refugee
3. What type of organization you are working in:
   ✓ government entity (e.g., Ministry of Health, etc.)
   ✓ research unit housed in an academic institution, government entity, intergovernmental agency (e.g., UN agencies), NGO
   ✓ service provider (e.g., health clinics)
4. To what extent did you get involved in the policy-development/formulation of health polices for Syrian refugees (i.e., Lebanon's MoPH 2016 Health Response Strategy and Ontario's2016 Phase 2: Health System Action Plan)?
5. Could you please describe your understanding of the policy-development process in the Lebanese MoPH HRS 2016/Ontario's Action Plan?
   ✓ The main aims of the developed health policies and the problems they were designed to address
   ✓ Is there anything about the rules of how these processes worked that might have generally influenced the developed policies?
      ✓ Rules put in place from past policies, the openness of the policy-development process to the public, the time-pressured nature of the policy-development process, and the nature of approval required for the policy played a factor in how the policies were developed
      ✓ Different stakeholder's (i.e., Syrian refugees, government, organization) interests played any role in the development of the health polices
      ✓ Other sources of ideas
      ✓ External factors like an election of a new government influenced how the policies were developed

B. Questions specific **to whether** research evidence was used in the policy-development process of the Lebanese MoPH HRS 2016/Ontario's Action Plan?

1. Given our discussion earlier, to what extent was research evidence used to develop the Lebanese MoPH HRS 2016/Ontario's Action Plan?
2. Can you describe to me what type of research evidence you used to inform the Lebanese MoPH HRS 2016/Ontario's Action Plan?
   - ✓ Empirical (e.g., observational studies, surveys and case studies) and conceptual papers (e.g., theoretical papers)
   - ✓ Primary or single studies research and secondary research (e.g., systematic reviews and other forms of evidence synthesis)
   - ✓ Indexed bibliographic databases or in what is called the grey literature
3. Can you identify if other types of information were used in some of the stages of the policy-development process?
   - ✓ Tacit knowledge or ordinary knowledge
   - ✓ Stakeholder's opinions

C. Questions specific to **under what conditions** research evidence was used in the policy-development process of the Lebanese MoPH HRS 2016/Ontario's Action Plan?

4. Is there anything about the rules of how these processes worked that might have influenced the developed policies?
   - ✓ Rules put in place from past policies, the openness of the policy-development process to the public, the time-pressured nature of the policy-development process, and the nature of approval required for the policy played a factor in how the policies were developed
   - ✓ Different stakeholder's (i.e., Syrian refugees, government, organization) interests played any role in the development of the health polices
   - ✓ Other sources of ideas?
   - ✓ External factors like an election of a new government influenced how the policies were developed
5. Would you consider the factors you just discussed to have influenced the policy-development stages in a minor or major way?

D. Questions specific to **how** research evidence was used in the policy-development process of the Lebanese MoPH HRS 2016/Ontario's Action Plan?

6. Can you describe how you used that research evidence?
   - ✓ Instrumental: used research evidence in specific and direct ways to solve a specific problem
   - ✓ Conceptual: used an overview of reviews of humanitarian-aid interventions to help identify areas where there is a need to give greater or lesser attention
   - ✓ Symbolic: used evidence to justify decisions already taken in relation to the developed policies
   - ✓ Evidence was used to learn about the benefits, harms, local costs, adaptations and stakeholder's views and experiences of different options
7. Can you describe how you accessed the research evidence? For example:
   - ✓ Reading original research
   - ✓ Reading reports produced by policy advisors or interest groups
   - ✓ Interacting with researchers or involving researchers in a working group
   - ✓ Interacting with peers or stakeholders or involving peers or stakeholders in a working group
   - ✓ Attending hearings about the health needs of Syrian refugees

Is there anything else that you could tell me to help me understand the policy-development process in detail?

Closing remarks:

- Are there documents (like memos, communications, minutes, etc.) that may help us in identifying the approach to research use employed by your organization for the management of health needs among Syrian refugees?
- Finally, do you know somebody whom do you think may give an important insight to the policy-development process?
- We will be analyzing the information you and others have given. We be sharing the results of the study with you at a later date. In the meantime, thank you for your time.

Chapter 4. Preface

This chapter continues the focus on supporting the use of evidence in crisis zones by examining a particular strategy identified in my framework in Chapter 2 as one promising way to support evidence use within the health research system, namely an evidence website. The chapter uses a qualitative user-testing study design to collect extensive interview data from decision-makers about their impressions of Evidence Aid. This chapter puts forward specific suggestions about how to improve this particular evidence website designed to support evidence use in crisis zones and more generally identifies insights for the use of this strategy.

I conceived the study design with my supervisor, Dr. John N. Lavis, and I was responsible for all the data collection and analysis, which took place between August 2018 and March 2019. The members of my supervisory committee each provided feedback on drafts of the chapter, which were incorporated into the paper.

At the time of writing, the paper presented in this chapter is under review at a journal.

Decision-makers' experiences with the Evidence Aid website to support 'real-time' use of research evidence to inform decision-making in crisis zones: A user testing study

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Abstract

Background: Humanitarian action in crisis zones is fraught with many challenges, including lack of timely and accessible research evidence to inform decision-making about humanitarian interventions. Evidence websites have the potential to address this challenge. Evidence Aid is the only evidence website designed for crisis zones that focuses on providing research evidence in the form of systematic reviews. The objective of this study is to explore decision-makers' views of Evidence Aid, contributing further to our understanding of the use of research evidence in decision-making in crisis zones.

Methods: We designed a qualitative user-testing study to collect interview data from decision-makers about their impressions of Evidence Aid. Eligible decision-makers included those with and without previous experience of Evidence Aid. All participants were either currently working or have worked within the last year in a crisis zone. All participants were asked to perform the same user experience- related tasks and answer questions about this experience and their knowledge needs. Data were analysed using a deductive framework analysis approach drawing on Morville's seven facets of the user experience: findability, usability, usefulness, desirability, accessibility, credibility, and value.

Results: Thirty-one interviews were completed, with senior decision-makers ($n=8$), advisors ($n=7$), field managers ($n=7$) analysts/researchers ($n=5$) and healthcare providers ($n=4$). Participant self-reported knowledge needs varied depending on the role of decision-maker. Overall, participants did not identify any 'major' problems (highest order) and only two 'big' problems (second highest order) with using the Evidence Aid

website, namely the lack of a search engine on the home page and that some full-text articles linked to from the site require a payment. Participants identified seven specific suggestions about how to improve Evidence Aid, many of which can also be applied to other evidence websites.

Conclusions: This is the first study to specifically focus on an evidence website for crisis zones, elaborated on the information needs of decision-makers, and put forward specific suggestions about how to improve evidence websites.

Keywords: evidence websites, evidence-informed decision making, research evidence, crisis zones, Evidence Aid, user testing

Background

Humanitarian action in crisis zones is fraught with many challenges, not the least of which is having rapid access to research evidence that has the potential to inform decisions. Acting on available research evidence can help to improve the effectiveness and efficiency of humanitarian interventions (143). Access to research evidence to support decision-making is even more imperative in crisis zones because the magnitude and speed of the disaster creates a unique setting with known difficulties around accessing research evidence in a timely way (e.g., insufficient time, limited search skills, limited access to relevant evidence) (8, 13, 52, 143-148). Existing research has focused primarily on identifying the challenges decision-makers face in accessing evidence in crisis zones, highlighting the need for evidence websites to support evidence use in a timely way. However, because there has been so little research done on the experiences of decision-makers in crisis zones with evidence websites, we currently do not know if such strategies address this key challenge. This analysis will help address this critical gap in the literature, contributing to efforts to support the use of research evidence in decision-making.

This gap persists in the existing literature for five main reasons. First, while literature exists which examines evidence websites in other settings, these studies do not focus on evidence use in crisis zones (63, 149, 150). Second, user-testing studies have tended to focus on facets of user experience without first investigating the information needs of users (150-152). This means that they potentially missed gaining valuable insight into how evidence websites can best meet decision-makers' knowledge needs.

Third, some studies have contributed evidence about best practices in organizing content, but there are many other facets of user experience that remain unexplored (153). Fourth, studies have not explored decision-makers' views of and experiences with using a database to find evidence summaries on specific health policy and systems-relevant questions (63, 153). Finally, there is a lack of third-party research about the effectiveness of evidence websites, with most existing research designed and conducted by groups associated with the website under study (63, 150, 153).

In light of the lack of third-party research in this area, this study presents a non-affiliated examination of the use of evidence websites by decision-makers in crisis zones. Evidence Aid is the only evidence website designed for crisis zones that focuses on providing research evidence in the form of systematic reviews. Systematic reviews critically appraise and summarize all relevant individual studies, which reduces the amount of time and search skills other stakeholders need to access and appraise large bodies of research (154). Evidence Aid has invested efforts to improve the site, but such efforts have not yet been formally evaluated. Using a user-testing study design, our objective in this paper is to explore the information needs of decision-makers working in crisis zones and their views of and experiences with the Evidence Aid website. This paper also aims to put forward specific suggestions about how to improve evidence websites designed to support the use of research evidence in decision-making in crisis zones. Many of these suggestions can also be applied to other evidence websites which support the use of evidence in decision-making more broadly.

Methods

Study aims

Using a user-testing study design, our objective in this paper is to explore the information needs of decision-makers working in crisis zones and their views of and experiences with the Evidence Aid website. This paper also aims to put forward specific suggestions about how to improve evidence websites designed to support the use of research evidence in decision-making in crisis zones. Many of these suggestions can also be applied to other evidence websites which support the use of evidence in decision-making more broadly.

Study design

User testing study design was used to address our research objective. This type of design is used widely in the field of product design and evaluation, and involves having users complete task-specific problems (33-35). User testing involves inviting representative users of a product (in this case a website) to participate in individual semi-structured interviews where they are asked about their experience as they interact with the website (36). This study used qualitative methods (e.g., interview data, thematic analysis, etc.) to describe users' knowledge needs, views and experiences with using Evidence Aid, gathering specific suggestions about how their experiences could be improved. Qualitative research methods have the potential to drive improvements to the experience of using particular resources, creating information to allow developers to make user-centered improvements. Our use of a concurrent think-aloud protocol allowed us to access user thoughts in-the-moment, lessening the chance that users would forget their

insights or dismiss them as unimportant when asked to discuss their experience at a later date (155, 156).

We started our interview with a set of preliminary general questions about the participant's profession and knowledge needs followed by a set of think-aloud user experiences and views while performing task specific questions. Our lack of involvement with Evidence Aid makes us particularly well positioned to elicit frank feedback. Participants were informed of our lack of involvement with Evidence Aid at the outset of the interview.

Defining Evidence Aid

Evidence Aid is an English language interface with some articles and user-friendly summaries available in Spanish and French. To be included in Evidence Aid, the systematic review must focus on the effectiveness of humanitarian action and include health-related outcomes. Evidence Aid provides appraisal for each of the systematic reviews. Research evidence is available on Evidence Aid in three ways: first, through a simple search bar located under a resources tab with the option of selecting month (e.g., March 2019) and category (e.g., emergency type). Second, research evidence is organized into four main categories: health issues (i.e., burns, cardiovascular disease), emergency type (i.e., flood, epidemic), humanitarian cluster (i.e., camp coordination and camp management, emergency shelter), and person groups (i.e., adolescents, adults). Finally, Evidence Aid produces curated collections of evidence specific to crisis zones (e.g., acute malnutrition – prevention and treatment in emergencies and humanitarian crisis).

Evidence Aid provides free access through their website to some of the full-text articles available on other websites that usually require a payment (e.g., the Cochrane library collection for earthquakes). However, some of the full-text articles available through the site do require a payment to access the content, although this is arguably outside of Evidence Aid's scope given the nearly limitless liability they would face if they offered free access to all articles.

Characteristics of participants

We purposively sampled two types of participants for the study: participants who have used Evidence Aid before and those who have not. All participants enrolled in the study were either currently working or have worked within the last year in a crisis zone. Participants were asked to self-identify the type of decision-maker they are based on their profession (e.g., senior decision-maker, advisor). All participants were asked the same general questions and user experience related task questions. Those who have used Evidence Aid before were asked and this additional information was used to explore patterns in their views of and experiences with evidence websites in addressing their research evidence needs.

Participant recruitment and sample size

A two-stage sampling approach was used to identify and recruit key informants (123, 157). The first stage included identifying participants in the following five categories based on their anticipated roles in decision-making in crisis zones and where appropriate across the humanitarian aid, health system, and health research system sectors: 1) senior decision-makers (e.g., presidents, directors); 2) field managers (e.g.,

field coordinators, heads of missions) directly involved in coordination and management of crisis zones; 3) healthcare providers (e.g., doctors, nurses) involved with either the development of medical guidelines in crisis zones or directly delivering medical care to people in crisis zones; 4) advisors directly involved in advising about policy development and implementation strategies; and 5) analysts and researchers directly involved in responding to research evidence requests from the previous four categories of participants. The second stage of recruitment used respondent-driven sampling; research participants in the first stage were asked to identify any additional potential informants.

To capture users who have used Evidence Aid, we sent a LinkedIn email invitation to a list of 789 members who are part of a LinkedIn thematic working group: "Health Systems in Fragile and Conflict Affected States". This thematic working group contained key actors in health who are working or formerly worked in fragile and conflict affected states and who were invited to participate in the Humanitarian Evidence Week (HEW) initiative led by Evidence Aid on November 6-12, 2017. Participants who have not used Evidence Aid before were recruited in three ways. First, we included in the same LinkedIn email invitation described above a request to nominate colleagues who are in similar roles but who did not participate in HEW and who did not use Evidence Aid. Second, we sent email invitations to those listed on a publicly available contact list for a quality improvement exercise conducted at Médecins Sans Frontières (MSF) that focused on MSF's approach in transferring research knowledge to policy and practice during the Syrian Refugee Crisis. Third, we sent email invitations to those identified through documentary and media analysis (using publicly available documents only).

We aimed at completing at least 5 user tests interviews for each type of participant category (i.e., senior decision-makers', field managers, healthcare providers, advisors, analysts and researchers) in both types of participants (i.e., those that have used Evidence Aid and those that have not), recognizing that this estimate was dependent on the availability of appropriate participants. Our sample size amounted to a total of 31 participants (Table 1).

Data collection methods

Interviews were conducted via Skype by the first author (AFK), who acted as both the interviewer and note taker. The interviews lasted approximately 60 minutes and were audio-recorded after receiving permission from the participant. Audio recordings were transcribed verbatim and the written transcriptions were used for data analysis. Potentially identifying information (e.g., name) were removed at the time of transcription. We conducted the interviews in English, which is the language used in Evidence Aid interface.

The user testing began with preliminary questions about the participant's profession, what sources of research evidence they use, and knowledge of evidence websites including Evidence Aid (an additional file shows this in more detail [see Additional file 1]). We provided participants with a set of instructions, starting from an empty browser window. This was followed by a series of tasks for the participant to perform, some of which involved looking for specific content tailored to their field or professional interests. For example, a healthcare provider in a crisis zone may choose to find a specific review about the effect of antibiotic resistance among children in refugee

camps. Other general tasks asked of the participants included finding help, finding the

search engine within Evidence Aid website, and finding information about Evidence Aid.

The concurrent think-aloud method was used throughout (35). As well, participants were

asked what were the major problems they faced, big problems or frustrations while

performing the task, minor issues, any positive feedback they would like to provide, and

suggestions for improving their experience. We explained to participants that major

problems are ones that have serious potential for causing users to use Evidence Aid

erroneously and therefore unable to complete the intended tasks. Big problems are ones

where users face frustration and difficulty in completing tasks but are able to work around

the problem, and minor issues are ones that slow down or inconvenience users

unnecessarily in completing tasks (158-160). Finally, to get at overall experience with

Evidence Aid we asked questions related to Morville's seven facets of the user

experience: findability, usability, usefulness, desirability, accessibility, credibility, and

value (161).

Data analysis

We used a deductive framework analysis approach towards our collected data

(162, 163). Framework analysis is a qualitative method that can be applied to research

that has specific questions, professional participants, and a limited time frame (163). This

approach allowed us to describe and interpret what is happening in a particular setting

(i.e., use of Evidence Aid) by asking our participants specific questions (162). It involved

a five-step process: familiarization (i.e., immersing ourselves in collected data making

notes of key ideas and recurrent themes), identifying a thematic framework (i.e.,

recognizing emerging themes), indexing (i.e., using NVivo to identify sections of data that correspond to particular themes), charting (i.e., arranging identified sections of data into table exhibits), and mapping and interpretation (i.e., analyzing key characteristics from the exhibits) (162).

Data were analysed by drawing on Morville's seven facets of the user experience: findability, usability, usefulness, desirability, accessibility, credibility, and value (161). A detailed description of the seven facets of the user experience is provided in Table 3. Morville's framework was selected because it combines the main facets of usability, incorporates emotional aspects of user experience, and is often used in other user-testing studies for exploring user experience in an information design context that Morville refers to as the 'honeycomb' (150, 151, 164).

Results

Participant profiles

Thirty-one interviews were completed (Table 1), with senior decision-makers (n=8), advisors (n=7), field managers (n=7) analysts/researchers (n=5) and healthcare providers (n=4). Good balance was achieved across types of organizations (e.g., non-governmental organizations; international agencies; government agencies, and academic institution). A high proportion of interviewees had not used Evidence Aid before (n=22), and were female (n=20).

Participant knowledge needs, types of information used to address knowledge needs, and sources for obtaining information

Many of our participants highlighted the scarcity of available knowledge relevant to crisis zones, with one senior decision-maker stating:

> *"there is never enough knowledge and evidence in fast evolving crisis especially when we deal with emergencies and we never know what is going on and we are always desperate to get more information. The lack of ability to get … information during a fast-moving developing disaster situation is a massive challenge"*

The distribution of participant knowledge needs, types of information used, and sources for obtaining information varied depending on the type of decision-maker (Table 2). The following knowledge needs were most cited by a specific type of decision-maker: policy development related to health-system strengthening and health-advocacy approaches by senior decision-makers; operational logistical management (e.g., setting up mobile health clinics in crisis zones) by field managers; clinical management of patients in a crisis zones by healthcare providers; and community-level program development (e.g., how to support behavior change in a community setting) and implementation strategies for any of the above four domains cited by advisors and senior decision-makers, respectively.

As for the types of information used by our participants to address their knowledge needs we focus our attention here on the ones that are within Evidence Aid's scope: systematic reviews and meta-analyses were mostly used by analysts and researchers, while intervention studies (e.g., clinical trials) were mostly used by senior decision-makers, healthcare providers, and advisors. Global guidelines (e.g., from World Health Organization) were mostly used by advisors. Finally, our participants obtained

information from a wide menu of sources (e.g., evidence websites such as ReliefWeb and Health Systems Evidence, reports by UN agencies, correspondence with senior decision-makers, and social networking sites such as Facebook and Twitter).

User experiences

Overall, there were two notable differences in responses across our diverse types of decision-makers and between users and non-users of Evidence Aid. First, analysts and researchers we interviewed demonstrated enthusiasm that Evidence Aid is attempting to bring research evidence closer to humanitarian aid workers, while some senior decision-makers were skeptical about using Evidence Aid as opposed to relying on information stemming from their ground operations to answer specific questions. Additionally, participants that have used Evidence Aid before were more familiar with the organization of tabs on the website which facilitated faster access to desired content than non-users. Finally, there were no notable differences in responses across gender.

Participants did not identify any 'major' problems (highest order) across the seven domains of the user experience (Table 3). However, participants identified two 'big' problems (second highest order) related to findability and accessibility. In terms of findability, participants frequently cited the lack of a search engine on the home page as a problem in locating desired articles. Turning to accessibility, participants expressed frustration that some of the full-text articles available through the site required a payment to access the content, and that timely assessment data on current crisis is missing; provision of access to pay-walled research and timely assessment data is outside of the

scope of Evidence Aid's services. We outline below – by domain – the most frequently cited minor issues, positive feedback, and specific suggestions.

Findability

Participants cited a minor issue of having difficulty locating the search bar. As for positive feedback, participants indicated that the four cluster areas (i.e., health issues, emergency type, humanitarian cluster, and person groups) under the "Resources" tab were helpful in locating desired information. In addition, participants appreciated that the 'tags' in the results page helped to further narrow down their search results. Participants suggested the addition of an advanced search filter for more targeted search results (e.g., date of last search, specific contexts, and language preference).

Usability

Participants cited as a minor issue having to undertake multiple steps to perform basic tasks to arrive at results on first use. However, some participants did note that once they had enough time on the site, they were able to perform basic tasks efficiently. A field manager commented:

"I appreciate that there is a learning curve until one is familiar with the site and how to use it efficiently"

To improve the usability of the site, some participants suggested creating a clearer statement of the site's purpose and the type of evidence it provides.

Usefulness

For minor issues, participants sometimes cited a lack of systematic reviews and guidelines related to their own particular areas of professional interests or fields of work.

Participants provided positive feedback related to how useful the site is in providing an independent evidence website for curated evidence on crisis zones for decisions-makers working in the field. As one senior decision-maker commented:

"It is good for humanitarian workers to have all the articles on one site

so they can go there and look for evidence-based approaches"

Most participants suggested that Evidence Aid should focus some of their efforts on turning the evidence available into explicit actionable points for decision-makers to use in crisis zones. A decision-maker highlighted this suggestion by stating:

"most people in humanitarian sector do not understand abstracts and

they almost alienate them. A better strategy is friendly-summary

reviews that are shorter, to the point, with clear actionable points"

Desirability

Participants cited a minor issue of photos on Evidence Aid being 'ordinary' (i.e., academic looking) and repetitive. A healthcare provider explained Evidence Aid choice of pictures on the home page stating:

"photos make it seem like a training workshop website with the pictures of

classroom settings"

Photos displayed on Evidence Aid promoted many participants (including the above healthcare provider) to suggest that the developers behind the site should consider using compelling photos that are relevant to humanitarian contexts. Participants did appreciate the basic simple design of the site and the lack of numerous pop up advertisements.

Accessibility

Participants cited concerns over whether documents can be read online or have to be downloaded first, the latter of which can be a problem in a low-bandwidth internet setting and would pose a significant limitation to those using the site from the frontlines of a crisis zone with a healthcare provider stating:

> *"Access to the internet in the field is a big barrier. It is a touch and go situation" – healthcare provider working in the field at an NGO*

Participants did appreciate that Evidence Aid is accessible to a broad spectrum of people working in the humanitarian sector who have access to the internet. A mobile friendly app, which is not currently available, or the use of a responsive web design was suggested as a way to improve the overall user experience. Senior decision-makers highlighted the importance of having open-access resources and timely assessment data on current crisis to inform decision-making, with one decision-maker stating:

> *"there needs to be more open-access resources. Organizations need to share early on data from the field that would allow us to somehow get other actors to build the evidence to better inform our decisions"*

A healthcare provider further emphasized the importance of open-access resources stating:

> *"open source access is still a big problem unless you have university library access"*

Credibility

Participants cited as a minor issue not clearly knowing what inclusion criteria are used to include best available evidence on the site. Participants emphasized that the direct and clear link to Cochrane Library increased their level of trust of the evidence presented. For specific suggestions, participants wanted to see greater visibility given to major contributors and funders with an advisor working at an NGO stating:

> *"highlight the main funders of the site on front page to make it more*
>
> *transparent with emphasis on the major contributors to Evidence Aid"*

Value for the user

The lack of awareness among humanitarian aid workers about the existence of or value added by Evidence Aid was cited by participants as a minor issue. Several participants made comments about hearing of Evidence Aid but never using it because of lack of awareness about its value. An advisor and a field manager highlighted this during the interview stating:

> *"I heard of it but never used it. It has the potential of being super*
>
> *helpful. But not many people know about it now" – advisor working*
>
> *at an NGO*

This prompted our participants to suggest that Evidence Aid should emphasize more clearly on their site why evidence matters in humanitarian action and to continue collaborating with other organizations to fill gaps with new systematic reviews.

Discussion

Our study suggests that there are no 'major' problems (highest order) and only two 'big' problems (second highest order) that decision-makers' experience with using Evidence Aid website, namely the lack of a search engine on the home page and that some full-text articles linked to from the site are not accessible without payment to the publisher. Our study participants identified a positive feedback related to credibility (i.e., direct and clear link to Cochrane Library increasing their level of trust of the evidence presented) that raises an important point that warrants highlighting. We found that users were inclined to make judgements about the trustworthiness of Cochrane library as the publishing source rather than critically assessing individual pieces of evidence, a similar finding in other studies (150). Additionally, participants identified a minor issue related to value (i.e., the lack of awareness among humanitarian aid workers about the existence of or value added by Evidence Aid), that provides a key insight into the challenges with supporting the use of research evidence to inform decision-making in crisis zones, as highlighted in other studies (2, 40, 101).

Seven specific suggestions made by our participants and illustrated in Table 3 present actionable suggestions for improving Evidence Aid, many of which can also be applied to other evidence websites designed to support the use of research evidence in decision-making, include: 1) create a home page-based search engine; 2) strive to ensure that basic tasks can be easily accomplished on first use; 3) ensure that the search results are presented in a user-friendly way (e.g., turn the evidence available into explicit actionable points), in a language that can be read (i.e., in common first languages), and

without jargon; 4) keep the site design simple, with images that are appropriate to crisis zones and capture users' attention; 5) accommodate diverse user contexts (e.g., inability to pay for articles) and physical functioning (e.g., colour blindness); 6) ensure accuracy of the information on the site (e.g., correct years of publication); and 7) increase the value of Evidence Aid for the user by achieving the second part of the stated mission (i.e., enabling the use of evidence) whereby Evidence Aid or another group can choose from a menu of additional ways to enable the use of research evidence (e.g., rapid reviews).

Our findings suggest the following three contributions to understanding evidence use in a crisis zone. First, many of our participants emphasized the need for evidence to be turned into explicit actionable points (e.g., check-lists). However, we recognize that this task is better delegated to a person or group that create connections between researchers and decision-makers (e.g., knowledge brokers). Second, our participants highlighted that evidence summaries must clearly indicate the basic findings from systematic reviews, including key messages that can be acted upon (149). Third, our decision-makers raised the importance of having a well-organized website that consists of a wide variety of relevant information, allowing them easy and efficient access to the best available evidence in the limited time they have available to make, inform, or advocate for a decision (63). Clearly, decision-makers have a diverse array of knowledge needs, and these findings reaffirm the importance of doing further scholarly work to better understand how to best support evidence use in crisis zones.

Findings in relation to other studies

Our finding that participants did not identify any major problems (and only two big problems) with using Evidence Aid aligns with previous studies identifying that users generally find there are many helpful attributes of using evidence websites (e.g., multiple sources of information in one spot) (149, 153). This study also aligns with other studies in putting forward specific suggestions to improve the use of evidence websites (e.g., functions in the users' first language) (149). Finally, this study complements existing literature in being the first study to specifically focus on an evidence website for crisis zones, elaborated on the information needs of decision-makers, put forward specific suggestions that address all facets of improving users experience, and independence of research team from Evidence Aid (40, 52, 63, 145, 149, 150, 153, 164-168).

Strengths and limitations

For the first of two strengths, we interviewed a large number and diverse range of people for a study of this type. The diversity in our study is within the types of decision-makers, organizational affiliations, whether they used Evidence Aid or not, and gender (and hence a likely broad sampling of the challenges decision-makers would face in navigating research evidence for use in crisis zones). Some notable differences in responses emerged across these diverse types of decision-makers and between users and non-users of Evidence Aid. However, there were no notable differences in responses across gender, or participant ability to verbally communicate their insights in English. Second, our study elaborated on the information needs of decision-makers working in crisis zones which provides valuable insight on how best to meet their knowledge needs.

One potential limitation to this study is that all our interviews, except one, were conducted with decision-makers not physically present in a crisis zone at the time of the interview. Increased time pressure in crisis zones may influence participants' views and experiences in finding relevant research evidence to make a decision. To mitigate this limitation, we purposively sampled participants who were either currently working or have worked within the last year in a crisis zone and we prompted them to consider real-life situations when responding.

Implications for practice

There are four main implications, the first of which is that the developers of Evidence Aid should continue their efforts of providing the best available evidence on the effectiveness of humanitarian action while taking into account the specific suggestions, summarized above, to improve the site. These specific suggestions can also be applied to other evidence websites designed to support the use of research evidence in decision-making. Second, the developers of Evidence Aid site should consider whether they or another group are better positioned to fulfill the second part of their mission -- "enabling the use of the best available research evidence" – by expanding their activities to include creating demand for research evidence, providing rapid reviews in response to decision-maker requests, and institutionalizing the use of research evidence, among other options (22, 169-172). Third, senior decision-makers working in crisis zones should work with humanitarian aid workers to raise awareness of the existence of evidence websites, like Evidence Aid, and to build their capacity to find and use research evidence in decision-

making. Finally, the users of Evidence Aid should continue to provide their feedback on how Evidence Aid and other evidence websites can best meet their knowledge needs.

Future research

The next steps in research could be for researchers to explore decision-makers' experiences with an updated version of Evidence Aid to 'test' (e.g., randomized controlled trials) if specific changes have improved the usability and use of the site. Also, researchers could evaluate future efforts by Evidence Aid or its partners to address the part of its mission focused on enabling the use of research evidence. Finally, researchers working in others domains (i.e., outside humanitarian crises) could use our methodology (i.e., diversity in user types of decision-makers and organizational affiliation, identifying knowledge needs of decision-makers, etc.) to explore decision-makers' views and experiences with other evidence websites designed to support evidence informed decision-making.

Conclusion

Decision-makers in crisis zones found Evidence Aid to be useful, accessible, and credible. However, they experienced some problems with namely the lack of a search engine on the home page and that some full-text articles linked to from the site require a payment. This is the first study to specifically focus on an evidence website for crisis zones, elaborated on the information needs of decision-makers, and put forward specific suggestions about how to improve evidence websites. By making evidence available, evidence websites provide one of the necessary inputs for evidence-informed decision-

making processes. The absence of evidence websites creates a clear gap in supporting evidence-informed decision-making.

List of abbreviations

KT: knowledge translation; HEW: Humanitarian Evidence Week; MSF: Médecins Sans Frontières

Declarations

Ethical approval and consent to participate

Ethics approval was obtained from the McMaster University through the Hamilton Integrated Research Ethics Board (HiREB), Project#: 4830. We also obtained consent for the process (including audio-recording) from all participants.

Consent for publication

Not applicable.

Availability of data and material

All data generated or analysed during this study are included in this published article.

Competing interests

All authors declare that they have no competing interests. No pre-existing relationship exists between the authors of this study and the group behind Evidence Aid.

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Authors' contributions

AFK conceived, collected the data, and drafted the manuscript. All authors participated in the design of the study, analysis of the data, and provided comments on drafts of the manuscript. All authors read and approved the final manuscript.

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Additional material
- Additional file 1: Appendix. Interview guide used in Test. .doc

References

1.   Altay N, Labonte M. Challenges in humanitarian information management and exchange: evidence from Haiti. Disasters. 2014;38(s1):S50-S72.
2.   Mellon D. Evaluating Evidence Aid as a complex, multicomponent knowledge translation intervention. Journal of evidence-based medicine. 2015;8(1):25-30.
3.   Allen C. A resource for those preparing for and responding to natural disasters, humanitarian crises, and major healthcare emergencies. Journal of evidence-based medicine. 2014;7(4):234-7.
4.   Kayabu B, Clarke M. The use of systematic reviews and other research evidence in disasters and related areas: preliminary report of a needs assessment survey. PLoS currents. 2013;5.
5.   Clarke M. Evidence Aid–from the Asian tsunami to the Wenchuan earthquake. Journal of Evidence-Based Medicine. 2008;1(1):9-11.
6.   Lavis J, Davies H, Oxman A, Denis J-L, Golden-Biddle K, Ferlie E. Towards systematic reviews that inform health care management and policy-making. Journal of health services research & policy. 2005;10(1_suppl):35-48.
7.   Lavis JN, Oxman AD, Moynihan R, Paulsen EJ. Evidence-informed health policy 1–Synthesis of findings from a multi-method study of organizations that support the use of research evidence. Implementation Science. 2008;3(1):53.
8.   Shearer JC, Dion M, Lavis JN. Exchanging and using research evidence in health policy networks: a statistical network analysis. Implementation Science. 2014;9(1):126.
9.   Straus SE, Tetroe J, Graham I. Defining knowledge translation. Canadian Medical Association Journal. 2009;181(3-4):165-8.
10.   Barbara AM, Dobbins M, Haynes RB, Iorio A, Lavis JN, Raina P, et al. McMaster Optimal Aging Portal: an evidence-based database for geriatrics-focused health professionals. BMC research notes. 2017;10(1):271.
11.   Lavis JN, Wilson MG, Moat KA, Hammill AC, Boyko JA, Grimshaw JM, et al. Developing and refining the methods for a 'one-stop shop' for research evidence about health systems. Health research policy and systems. 2015;13(1):10.
12.   Rosenbaum SE, Glenton C, Cracknell J. User experiences of evidence-based online resources for health professionals: user testing of The Cochrane Library. BMC medical informatics and decision making. 2008;8(1):34.
13.   Mijumbi-Deve R, Rosenbaum SE, Oxman AD, Lavis JN, Sewankambo NK. Policymaker experiences with rapid response briefs to address health-system and technology questions in Uganda. Health research policy and systems. 2017;15(1):37.
14.   Rosenbaum SE, Glenton C, Nylund HK, Oxman AD. User testing and stakeholder feedback contributed to the development of understandable and useful Summary of Findings tables for Cochrane reviews. Journal of clinical epidemiology. 2010;63(6):607-19.
15.   Mutatina B, Basaza R, Obuku E, Lavis JN, Sewankambo N. Identifying and characterising health policy and system-relevant documents in Uganda: a scoping review to develop a framework for the development of a one-stop shop. Health research policy and systems. 2017;15(1):7.

16.   Gariba EB. User-testing of Health Systems Evidence and the EVIPNet Virtual Health Library among health system policymakers and stakeholders in Uganda and Zambia: a qualitative study. McMaster University 2015.

17.   Greenhalgh T. How to read a paper: Papers that summarise other papers (systematic reviews and meta-analyses). Bmj. 1997;315(7109):672-5.

18.   Nielsen J, Loranger H. Prioritizing web usability: Pearson Education; 2006.

19.   Kuniavsky M. Observing the user experience: a practitioner's guide to user research: Elsevier; 2003.

20.   Van Den Haak M, De Jong M, Jan Schellens P. Retrospective vs. concurrent think-aloud protocols: testing the usability of an online library catalogue. Behaviour & information technology. 2003;22(5):339-51.

21.   Krahmer E, Ummelen N. Thinking about thinking aloud: A comparison of two verbal protocols for usability testing. IEEE Transactions on Professional Communication. 2004;47(2):105-17.

22.   Newell A, Simon HA. Human problem solving: Prentice-Hall Englewood Cliffs, NJ; 1972.

23.   Ericsson KA, Simon HA. Verbal reports as data. Psychological review. 1980;87(3):215.

24.   Gentles SJ, Charles C, Ploeg J, McKibbon K. Sampling in qualitative research: insights from an overview of the methods literature The Qualitative Report. 2015;20(11):1772-89.

25.   Yin RK. Basic types of designs for case studies. Case study research: Design and methods 5th ed. Thousand Oaks: Sage Publications; 2014.

26.   Tan W-s, Liu D, Bishu R. Web evaluation: Heuristic evaluation vs. user testing. International Journal of Industrial Ergonomics. 2009;39(4):621-7.

27.   Nielsen J, editor Finding usability problems through heuristic evaluation. Proceedings of the SIGCHI conference on Human factors in computing systems; 1992: ACM.

28.   Nielsen J. Iterative user-interface design. Computer. 1993;26(11):32-41.

29.   Morville P. User Experience Design Ann Arbor: Semantic Studios LLC2004 [Available from: http://semanticstudios.com/publications/semantics/000029.php.

30.   Ritchie J, Spencer L. Qualitative data analysis for applied policy research. The qualitative researcher's companion. 2002;573(2002):305-29.

31.   Srivastava A, Thomson SB. Framework analysis: a qualitative methodology for applied policy research. 2009.

32.   Ager A, Burnham G, Checchi F, Gayer M, Grais R, Henkens M, et al. Strengthening the evidence base for health programming in humanitarian crises. Science. 2014;345(6202):1290-2.

33.   Blanchet K, Ramesh A, Frison S, Warren E, Hossain M, Smith J, et al. Health in humanitarian crises 1 Evidence on public health interventions in humanitarian crises. 2017.

34.   Turner T, Green S, Harris C. Supporting evidence-based health care in crises: what information do humanitarian organizations need? Disaster medicine and public health preparedness. 2011;5(1):69-72.

35.   Tharyan P, Clarke M, Green S. How the Cochrane collaboration is responding to the Asian tsunami. PLoS medicine. 2005;2(6):e169.
36.   Wallace J, Nwosu B, Clarke M. Barriers to the uptake of evidence from systematic reviews and meta-analyses: a systematic review of decision makers' perceptions. BMJ open. 2012;2(5):e001220.
37.   Petticrew M, McCartney G. Using systematic reviews to separate scientific from policy debate relevant to climate change. American Journal of Preventive Medicine. 2011;40(5):576-8.
38.   Kar-Purkayastha I, Clarke M, Murray V. Dealing with disaster databases–what can we learn from health and systematic reviews?: Application in practice. PLoS currents. 2011;3.
39.   Virzi RA. Refining the test phase of usability evaluation: How many subjects is enough? Human factors. 1992;34(4):457-68.
40.   Nielsen J, Landauer TK, editors. A mathematical model of the finding of usability problems. Proceedings of the INTERACT'93 and CHI'93 conference on Human factors in computing systems; 1993: ACM.
41.   Nielsen J. Why you only need to test with 5 users. Useit. com Alertbox; 2000.
42.   Lavis JN, Røttingen J-A, Bosch-Capblanch X, Atun R, El-Jardali F, Gilson L, et al. Guidance for evidence-informed policies about health systems: linking guidance development to policy development. PLoS medicine. 2012;9(3):e1001186.
43.   Moat K, Lavis J. Supporting the use of Cochrane Reviews in health policy and management decision-making: Health Systems Evidence. Cochrane Database of Systematic Reviews. 2011(2).
44.   Moat K, Lavis J. Supporting the use of research evidence in the Americas through an online" one-stop shop": the EVIPNet VHL. Cadernos de saude publica. 2014;30(12):2697-701.
45.   Wilson M, Lavis J, Grimshaw J. Supporting the use of research evidence in the Canadian health sector. Healthcare Q. 2012;15:58-62.
46.   Lavis JN. How can we support the use of systematic reviews in policymaking? PLoS medicine. 2009;6(11):e1000141.
47.   Lab SPT. Stanford Guidelines for Web Credibility: Stanford University; 2004 [Available from: http://credibility.stanford.edu/guidelines/index.html.

Table 1. Profiles of respondents involved in the user-testing exercises[2]

Type of decision-maker	% (n)	Organizational affiliations	Organizational types	Used EA before	Sex
Senior decision-maker	26% (n=8)	Médecins Sans Frontières (n=4) International Federation of Red Cross and Red Crescent Societies (n=2) Palestinian National Institute of Public Health (n=1) Public Health England (n=1)	NGO (n=6) Government agency (n=2)	5 No 3 Yes	6 F 2 M
Advisor	23% (n=7)	International Federation of Red Cross and Red Crescent Societies (n=2) Pan American Health Organization (n=2) Goal Global (n=1) United Nations High Commissioner for Refugees (n=1) World Vision Canada (n=1)	NGO (n=4) International agency (n=3)	5 No 2 Yes	4 F 3 M
Field manager	23% (n=7)	International Federation of Red Cross and Red Crescent Societies (n=2) International Rescue Committee (n=2) International Medical Corps (n=1) Médecins Sans Frontières (n=1) Save the Children Canada (n=1)	NGO (n=7)	4 No 3 Yes	4 F 3 M
Analyst/researcher	16% (n=5)	ALNAP (n=1) International Federation of Red Cross and Red Crescent Societies (n=1) Médecins Sans Frontières (n=1) University of Amsterdam (n=1) World Health Organization (n=1)	NGO (n=3) Academic institution (n=1) International agency (n=1)	4 No 1 Yes	3 F 2 M

[2] This table should appear on page 9 under *Participants profile,* Results section

| Healthcare provider | 13% (n=4) | Médecins Sans Frontières (n=3) Rose Charities and Association of Medical Doctors of Asia (n=1) | NGO (n=4) | 4 No | 3 F 1 M |

Table 2. Users' knowledge needs, types of information used to address their knowledge needs, and sources for obtaining information[3] [4]

Categories [5]	Senior decision-maker	Field manager	Healthcare provider	Advisor	Analyst/researcher
Knowledge needs					
1. Policy development (e.g., health-system strengthening, health-advocacy approach, etc.)	✔	✓	✓	✓	✓
2. Operational logistical management (e.g., military and political context, shelter, security, hygiene, mobile clinic set ups, human resources issues, cross-border health supplies management, etc.)	✓	✔		✓	✓
3. Clinical management of patients in a crisis situation (e.g., case management, etc.)		✓	✔	✓	✓
4. Community-level program development (e.g., behavior change support, etc.)				✔	
5. Implementation strategies for any of the above (i.e., policy development, operational logistical management, clinical management, and community level program development)	✔				

[3] This table should appear on page 9 under *Participant knowledge needs, types of information used to address knowledge needs, and sources for obtaining information,* Results section

Table Legend:

[4] **Bolded** checkmarks √ indicate most cited by respondents. Multiple bolded checkmarks for the same category indicates equal frequency of citation by respondents.

[5] Sub-categories are listed from the most cited to the least cited

Types of information used[6]					
Data:					
1. country specific registries and surveillance data	✓				
Research evidence:					
1. systematic reviews and meta-analyses	✓	✓	✓	✓	✓
2. single context-specific case studies	✓	✓	✓	✓	✓
3. intervention studies (e.g., clinical trials)	✓		✓	✓	✓
4. surveys	✓	✓	✓	✓	
5. observational studies		✓			✓
6. conceptual papers (e.g., theoretical papers)		✓	✓		
Guidance:					
1. internal guidance documents		✓	✓	✓	
2. global guidelines (e.g., WHO)	✓			✓	✓
Expert opinion:					
1. expert opinions from the field		✓	✓	✓	✓
Stakeholder insights:					
1. stakeholder tacit knowledge or ordinary knowledge		✓			✓
2. stakeholder opinions	✓	✓			

[6] **Bolded** bullet points are within Evidence Aid scope (i.e., able/appropriate for EA to do given mission of website: "to alleviate suffering and save lives by providing the best available evidence on the effectiveness of humanitarian action and enabling its use"

Undefined combinations of the above:				
1. internal organizational field assessment information	✓	✓	✓	✓
2. lessons learned discussion papers				✓
Sources for obtaining information				
Databases:				
1. one-stop shops:				
1. ReliefWeb: contains many different types of information but predominantly news and not research evidence	✓ ✓	✓	✓	✓
2. Health Systems Evidence: contains systematic reviews on a given topic related to health-system arrangements or implementation strategies			✓	
3. Zika communication Network (ZCN): contains evidence-based toolkits and guidance related to Zika virus			✓	
2. organizational databases that provide only that organization reports (e.g., ACAPS, ALNAP7, Chatham house library, Cochrane)	✓ ✓		✓	✓
3. organizational databases that provide access to other	✓ ✓	✓	✓	✓

7 In addition to carrying out original research, ALNAP hosts a library of evaluations of humanitarian action from other sources

information (e.g., MEDBOX, WHO: HINARI)					
4. Google (e.g., google scholar, general google search)		✓	✓	✓	✓
5. indexed bibliographic databases accessed through University library subscriptions (e.g., Science Direct, Scopus, Up-to-date)		✓	✓	✓	✓
6. indexed bibliographic databases accessed through other mechanisms (e.g., PubMed)	✓	✓		✓	✓
7. organizational internal databases	✓	✓	✓	✓	
8. media websites (e.g., print media, broadcast media)	✓				
• Reports:					
1. reports by UN agencies (e.g., IOM, OCHA, UNHCR, UNICEF, WHO)	✓	✓	✓	✓	✓
2. internal reports (e.g., ICRC, MSF, ODI, Save the Children,)	✓	✓	✓	✓	✓
3. reports by US agencies (e.g., CDC, CIA fact sheets, USAID)	✓		✓	✓	
4. field staff reports	✓	✓			
5. reports by charitable organizations (e.g., Bill & Melinda Gates, Oxfam)		✓			
6. reports by UK agencies (e.g., Rebuild consortium)				✓	
• Correspondence and social networks:					
1. Email subscriptions (e.g., Disaster management	✓		✓	✓	

information, Global Health Network, William Brighter Institute)			
2. Social networking sites (e.g., Facebook, ResearchGate, Twitter)		✓	✓
3. memos and correspondence distributed across the whole organization			✓
4. direct correspondence with senior-decision makers	✓		
5. direct correspondence with review article authors	✓		

Table 3. Users' experiences using Evidence Aid (EA)[8] [9]

Domain	Issues raised			Positive feedback[10]	Specific suggestions
	Major problems	**Big problems or frustrations**	**Minor issues**		
Findability • Easy to find the site with a Google search or URL • Easy to locate desired articles using a search engine, tabs, closed dictionary or a combination • Easy to locate desired information about/from articles using initial display and/or supplementary webpages on site or on other sites	• None	• *Home page does not have a search engine* • **Difficulty identifying correct terms to enter into the search engine**	• *Difficulty locating the search bar* • **Difficulty locating user-friendly summaries** • **Lack of search categories to narrow down the search results** • **Latest content banner on home page is heavily focused on internal Evidence Aid activities and less on finding and retrieving resources to support evidence-informed decision-making in crisis zones** • **Difficulty locating supplemental information on other sites (e.g., dead links)**	• *Four cluster areas under "Resources" are helpful in finding research evidence* • *Results 'tags' further narrows the search results* • Website is easy to find with a Google search or URL • Clearly marked tabs on home page to arrive at Resources, Events, etc., • Search bar under Resources is helpful • Rapid display of search results	• *Add an advanced search filter (e.g., date of last search, specific contexts, language preference) for more targeted search results* • **Bring forward to the Home page the following:** ❖ **search engine** ❖ **four cluster areas** ❖ **feature systematic reviews and best practice health guidelines related to a current crisis** ❖ **organize search results according to target user (e.g., researcher, decision-maker, etc.)**

[8] This table should appear on page 10 under *User's Experiences*, Results section

Table Legend:

[9] *Italicized* bullet points indicate most cited by respondents. Multiple *italicized* points for the same category indicates equal frequency of citation by respondents.

Bolded bullet points are within Evidence Aid scope (i.e., able/appropriate for EA to do given mission of website: "to alleviate suffering and save lives by providing the best available evidence on the effectiveness of humanitarian action and enabling its use"

[10] Positive feedback column does not use bolded bullet points to indicate whether the respondent's feedback is within Evidence Aid scope

Usability • Purpose and scope of the site clearly described • Basic tasks easily accomplished on first use • Search goals achieved with effectiveness, efficiency and satisfaction	• None	• None	• *Basic tasks require undertaking multiple steps to arrive at results on first use* • **Not clear what the purpose of the website is, target audience, or the type of evidence it provides** • **Not clear how Evidence Collection is created and how it is different from the available research evidence on website**		• *Create a clearer statement on purpose of site and type of evidence it provides* • **Promote and clarify the purpose of Evidence Collection**
Usefulness • Nature of information retrieved provides value (e.g., addresses question without jargon and in an understood language)	• None	• None	• **Little focus on current and ongoing crises – most evidence presented is post crisis** • **User-friendly summaries do not contain enough relevant details to make an informed decision on whether to read the full article** • Lack of systematic reviews and guidelines related to: ❖ *participants' particular areas of professional interests or field of work* ❖ context-specific research evidence ❖ all answers to questions relevant to humanitarian action ❖ site, search results, user-friendly summaries, and	• *Useful in providing an independent evidence website for curated evidence on crisis zones for decision-makers working in the field* • Once located: ❖ user-friendly summary is concise, easy to understand, and practical in deciding whether to read full text ❖ the evidence-based guidelines are good in providing take-home messages • Contains evidence related to both man-made and natural disasters • Provision of some content on the site in	• *Better linkage of evidence into action – turning the evidence available into explicit actionable points for decision makers in crisis zones* • **Include research evidence that addresses:** ❖ **strengthening health systems** ❖ **implementation strategies for interventions in humanitarian crisis** ❖ **building capacity towards use of research evidence** • Add more content in other languages • Survey end-users about their needs

			• full text in different languages • Lack of single studies (e.g., "real-time" data and evaluations) in addition to systematic reviews and guidelines	• other languages (e.g., Spanish) is useful • Contains more systematic reviews than other websites • Fills the gap between academic research (i.e., systematic reviews) and action in humanitarian aid settings • Resources tab regarding recent crises is important	
Desirability • Images reflect the purpose and scope • Design conveys a unique and appropriate identity (e.g., name, logo, font type & size, colours, and sophistication of features)	• None	• None	• **Photos are ordinary (i.e., academic looking) and repetitive** • **Amount of white background on screen is problematic for people who work on big screens & high definition** • **Font size is smaller than some respondents would prefer** • **Logo is similar to the ONE and MSF website**	• *Basic design: simple, not a lot of pop ups* • Home page is clean and organized • Good choice of colors on the website • "Evidence Matters" is catchy • Title: "Evidence Aid" is appealing	• ***Use compelling photos relevant to humanitarian contexts*** • **Use infographics to breakdown key findings from the evidence**
Accessibility • Accommodates diverse user contexts (e.g., inability to pay article-access fees or avoid them through affiliations with universities with paid subscriptions, inability to use high bandwidth features)	• None	• *Some of the evidence available is not open-access (i.e., requires a payment)*	• *Widespread use of the color red creates challenges for those with color blindness* • *Concerns over whether documents can be read online or have to be downloaded first - a problem in a low bandwidth internet setting*	• *Accessible to a broad spectrum of people working in the humanitarian sector who have access to the internet* • Useful during a current large-scale humanitarian crisis or for select other topics in providing time-limited free access to	• ***Create a mobile friendly app or use responsive design***

				full-text articles that are normally behind a pay wall	
• Accommodates diverse physical functioning in the user (e.g., colour choices accommodate color blindness, font size is changeable) Credibility[11] • Easy to verify accuracy of information on site (e.g., clear indication of inclusion criteria of research evidence, objective assessment of available research evidence, links to credible external sources (e.g., Cochrane), provides complete exhaustive summary of evidence (e.g., systematic reviews)) • Clear illustration that honest and trustworthy people stand behind the site (e.g., profile description of people)	• None	• None	• *Not clear what inclusion criteria is used to include the best available evidence* • Concerns over the frequency of updating latest available research evidence	• *Direct and clear link to Cochrane Library increased level of trust by respondents* • Seems to be continuously updated with the newest content upfront for easier access • Team and advisory committee behind the site are credible individuals • Objective assessment of research evidence • Availability of systematic reviews • Available research evidence does not seem to be directly linked to a particular funding source	• *Give greater visibility to major contributors & funders*

• Site is updated frequently (i.e., content been reviewed recently) • Restraint in any promotional content (e.g., ads) or direct link to a particular funding source					
Value for the user • Intended users are aware of the site • The site advances the mission of the organization: "to alleviate suffering and save lives by providing the best available evidence on the effectiveness of humanitarian action and enabling its use"	• None	• None	• *Lack of awareness among humanitarian aid workers about the existence of or value added by Evidence Aid*	• *A solid attempt to putting together multiple sources of information in one spot* • Substantial efforts in partnering with other organizations to fill gaps with new systematic reviews • Specificity to humanitarian action is helpful	• ***Emphasize why evidence matters in humanitarian action*** • ***Continue collaborating with other organizations to fill gaps with new systematic reviews*** • **Choose from a menu of additional ways to enable the use of the site and its contents (e.g., personalized briefing notes, rapid evidence synthesis, webinars, etc.)**

Additional file 1

Appendix 1. **Interview guide used in test**

Introduction
Hello, my name is Firas Khalid and I want to thank you for taking your time to meet/speak with me today. My study is exploring your views and experiences of the Evidence Aid website. I would like to start this interview by asking some general questions. Please feel free to stop me at any point to ask for any clarifications.

- ✓ Denotes probes/prompts

Section A: General Questions
1. Do you have any questions for me before proceeding to the interview?
2. Could you please tell me more about the kind of work you are assigned to do?
3. Could you please describe some of your knowledge needs in relation to the line of work you do?
   - ✓ Knowledge needs related to clinical management of patients in a crisis situation
   - ✓ Knowledge needs related to operational logistical management (i.e., shelter, security, hygiene, mobile clinic set ups, mass immunizations, human resources issues, etc.,)?
   - ✓ Knowledge needs related to policy-development in a crisis situation?
4. We define research evidence as the output of research that has been conducted in a systematic way and reported in a transparent manner. What kind of research evidence do you use to address your knowledge needs?
   - ✓ Empirical (e.g., observational studies, surveys and case studies) and conceptual papers (e.g., theoretical papers)
   - ✓ Primary or single studies and secondary research (e.g., systematic reviews and other forms of evidence synthesis)
   - ✓ Indexed bibliographic databases or in what is called the grey literature
   - ✓ Other types of information, including tacit knowledge or ordinary knowledge and stakeholder opinions
5. Where did you go to obtain research evidence to address your knowledge needs?
   - ✓ Could you tell us about your online searching habits?
   - ✓ What sources of online information do you usually use in relation to your work?
6. Had you heard about Evidence Aid before I contacted you for this interview?
   ❑ Yes   ❑ No
7. Have you used Evidence Aid before?
❑ never used it before   ❑ used it a few times   ❑ used it a lot – please describe frequency

If the answer to #7 is used it a few times or used it a lot, proceed to section B of this interview guide: "user experience related task questions"

If the answer to #7 is never used it before, proceed to the following set of questions followed by section B of this interview guide

8. Why have you not used Evidence Aid Website before?
   ✓ Never heard of it
   ✓ Not relevant to my knowledge needs
   ✓ Could not locate it
9. Did you use any other evidence websites before?
   ❑ **YES**   ❑ **NO**
10. If **YES,** could you please state which ones?

Section B: "user experience related task questions"
Participants now will be asked to sit in front of a computer. Participants will be asked to think out loud during the whole session and reminded of this throughout the interview.

11. Could you please now navigate to Evidence Aid website:
12. What are your initial reactions to the front page?
13. Could you please now find a relevant review on non-communicable diseases in humanitarian crisis?
14. Could you please now find a relevant review on epidemic outbreaks in humanitarian crisis?
15. Could you please now find a relevant review on camp coordination in humanitarian crisis?
16. Could you please now find a relevant review on displaced people in humanitarian crisis?
17. Could you please now look for specific content related to a topic that is relevant to your field or professional interests?
18. Could you please now look for a relevant systematic review related to a topic that is relevant to your field or professional interests?
19. Could you please now look for evidence-based guidelines related to a topic that is relevant to your field or professional interests?
20. Could you please now look for a user-friendly summary of reviews related to a topic that is relevant to your field or professional interests?
21. Where would you go if you run into a problem and need help to navigate the site?
22. Could you please now start a new search?
23. Where would you go if you wanted to know more about who is behind the site, how it was developed, target audience, and key advantages of using the site?
24. Any major problems you faced with the tasks we asked you to perform?
25. Any big problems or frustrations you faced while performing the tasks?
26. Any minor issues you would like to highlight?
27. Any positive feedback you would like to provide?
28. Any specific suggestions for improving your experience?

Section C: Questions related to overall experience

1. Findability: To what extent did you find Evidence Aid navigable where you can easily locate and find what you needed?
2. Usability: To what extent did you find it easy to use and satisfying to use Evidence Aid website?
3. Usefulness: To what extent did you find that Evidence Aid fills a gap that you needed filled?
4. Desirability: Could you describe how you found Evidence Aid use of images, identity, brand, and other elements of the design that you found to be desirable?
5. Accessibility: To what extent did you find that Evidence Aid easily available to you and other decision-makers' like you or to ones that have difference preferences or disabilities?
6. Credibility: To what extent did you trust and believe what is presented to you on Evidence Aid and what elements of Evidence Aid website influenced this trust?
7. Value: To what extent did you find Evidence Aid website advancing the mission of the Evidence Aid group of ""providing the best available evidence on the effectiveness of humanitarian action and enabling its use"?
8. Is there anything else that you would like to add?

Closing remarks:

a. Do you know one or two others who would be well suited to participate in a similar interview.
b. Finally, we will be analyzing the information you and others give us. We will be sharing the results of our study with you at a later date. In the meantime, thank you for your time.

Chapter 5. Conclusion

Over the last decade we have witnessed an increase in both the availability and accessibility of research evidence. With this, we have observed a greater recognition of, and more attention given to, supporting the use of research evidence in decision-making. Moreover, greater demand has been placed on decision-makers at all levels and in all fields to demonstrate that their decisions are based on the best available evidence. While debates and discussions continue in systems that have been instituting explicit mechanisms to support evidence use in decision-making, the humanitarian aid field is starting to catch up. This field is now garnering greater attention, with peer-reviewed articles on evidence use in crisis zones increasingly common (2-4, 12, 37, 84, 101, 174-176). But as others in the literature have stated, it is not simply a process of providing more evidence, but rather finding ways to support the use of evidence in decision-making (40, 51, 54, 95, 170, 171, 177).

Overall, the three original research chapters presented in this dissertation contribute to an increased understanding of the role of research evidence in informing decision-making in crisis zones. This chapter begins by summarizing the main findings from each of the three studies, then focuses on the three studies as a package, presenting their substantive, methodological and theoretical contributions, strengths and limitations, implications for policy and practice, and ramifications for future research.

Principal findings

My use of a critical interpretive synthesis (chapter 2) generated a new conceptual framework that outlines strategies that leverage the facilitators and address the barriers to

evidence use within different systems — political, health, humanitarian aid, and health research. The different strategies can be undertaken by different actors within each system who have an influence on the use of evidence in crisis zones. The strategies to support evidence use can be used sequentially or simultaneously and within or across the four systems.

In chapter 3, I focused in part on using the framework developed in chapter 2 to help inform a case study of policy development related to a crisis, focusing in particular on the political system but secondarily on the interplay between the three of the four systems identified in the framework (i.e., political, health, and humanitarian aid systems). My case study identified that research evidence was not the main determining factor influencing the policy-development process for Syrian refugees in Lebanon and Ontario. Four other broad factors helped to explain the overall policy-development for Syrian refugees in Lebanon and Ontario: development of health policies without significant chance for derailment from other government bodies (Lebanon) or opposition parties (Ontario) (i.e., facing no veto points), government's engagement with key societal actors to inform the policy-development process, the embedded values underpinning the process, and external factors significantly influencing the policy-development process.

Finally, I examined a strategy identified in my framework as a key effort in supporting evidence use in crisis zones (Evidence Aid). My examination resulted in identifying seven specific suggestions about how to improve Evidence Aid, many of which can also be applied to other evidence websites. Overall, decision-makers in crisis zones found Evidence Aid to be useful, accessible, and credible. However, they

experienced some problems with the lack of a search engine on the home page and some full-text articles linked to from the site requiring a payment.

Thesis contributions:

Substantive contributions

This package of studies examines knowledge translation (KT) innovations in a setting that has been missing in the broader KT map: crisis zones. Thus, a major contribution of this thesis is adapting the broader KT literature to crisis zones, putting forward tangible strategies to improve evidence use in this unique environment. The strategies to support evidence use can occur sequentially or simultaneously within or across the four identified systems —— political, health, humanitarian aid, and research.

The findings from my case study identified the political factors that influence policy development in a humanitarian crisis, which other policymakers can learn from when looking to influence similar policy-development processes in other contexts. In particular, two of my identified factors can be leveraged by other policymakers to influence similar processes in other contexts: 1) the importance of watching for focusing events that galvanise public interest and push forward the policy-development process; and 2) the government's engagement with key societal actors to inform the policy-development process.

Finally, the specific suggestions to improve Evidence Aid can be used by Evidence Aid and others looking to design better evidence websites to support evidence use in decision-making. Thus, in addition to strengthening efforts to support evidence-informed decision-making, this thesis points to the fact that it is equally important to

continuously raise awareness about the benefits of using evidence websites and KT platforms (130).

Methodological contributions

This dissertation used a range of qualitative methods to answer novel research questions. First, the CIS approach prompted me to come to terms with a disparate body of literature around evidence use in crisis zones, trying to understand the strategies in relation to each other. This allowed me to start my examination broadly to then build a coherent overall framework. Second, the embedded qualitative case study design allowed me to go deeper into one of my four identified systems, the political system, to gain a comprehensive and rich understanding of the political factors in the policy-development process for Syrian refugees in two different settings. Finally, the user testing study design is used widely in the field of product design and evaluations, and used for the first time in this thesis to examine an evidence website for crisis zones. This allowed us to zero-in on a particular strategy to support evidence use in crisis zones within the health research system.

Theoretical contributions

During a humanitarian response, decision-makers tend to rely on their professional judgement to make decisions, as their main goal is the provision of support to people affected by the crisis in often unpredictable situations. Part of the challenge in getting decision-makers to account for research evidence alongside their professional judgement is their uncertainty if the existing research evidence can be applied to their unique setting. Systematic reviews offer a way to address this challenge by summarizing the evidence

from studies conducted in a variety of different settings (178). However, access to these systematic reviews, and the ability to act upon their findings, remains a challenge. What is currently missing from the theory is specific strategies to support evidence use in crisis zones that leverage the facilitators and address the barriers to evidence use within different systems (e.g., political, health, etc.,). The application of a CIS (introduced in chapter 2) to this topic led to the development of a new conceptual framework that describes the key strategies to support evidence use in crisis zones in different systems. The strategies can be employed to integrate the use of evidence more systematically in crisis zones.

Strengths and limitations

Within humanitarian aid research, this thesis is the first to explicitly focus on the four interconnected systems — political, health, international humanitarian aid, and health research. Research to date has tended to take a broader, non-system specific approach to examining evidence use in crisis zones. This makes it challenging to identify which system the strategies to support evidence use are best handled by and, within a system, which actor is best suited to implement the strategies. The systems level analysis explored in this thesis contributes to alleviating this challenge by focusing on each system specifically, and the actors that can exert influence on supporting evidence use within them.

The use of strategically selected political and health-systems theoretical frameworks for data analysis (3i+E framework and established taxonomy of 'health systems arrangements', respectively) allowed for deeper understanding of the drivers that

influence the policy-development process in crisis zones. Another strength of this thesis is the range of qualitative research methods used to address novel research questions, demonstrating their collective feasibility and utility, and the comprehensiveness of the sources of information used to understand the role of research evidence in decision-making in crisis zones. Those sources were existing knowledge & literature (chapter 2), policy documents and media articles (chapter 3), and key informant interviews (chapter 3 & 4).

One limitation of this thesis is that despite my best efforts to examine evidence use in crisis zones, I was unable to make assertions on how context influences the application of strategies to support evidence use in crisis zones in different systems. For example, it is considerably easier to convene a stakeholder dialogue to inform policy options within a relatively stable county (i.e. for Syrian refugees in Lebanon), rather than attempting to convene dialogue in the midst of war zones, outbreaks or natural disasters. I hope that the findings presented in this thesis serve as a foundation for research that aims to explore the impact of context on strategic outcomes related to evidence use/uptake.

Additionally, there was considerable variety in the availability of data within each individual study. Chapter 2, "*Supporting the use of research evidence in decision-making in crisis zones in low- and middle-income countries: a critical interpretive synthesis*", was limited by a paucity of literature relating to which systems can best handle the proposed strategies to support evidence use in crisis zones. I addressed this limitation by drawing on existing KT literature to inform my interpretation of which system the strategy is best positioned in. In chapter 3, "*The governmental health policy-development*

process for Syrian refugees: an embedded qualitative case studies in Lebanon and Ontario", I was unable to gain the insights of key informants from Ontario's MOHLTC. I addressed this challenge interviewing other key informants who were identified through documentary analysis and by the MOHLTC as actors who were directly involved in the policy-development process. In chapter 4, "*Decision-makers' experiences with the Evidence Aid website to support 'real-time' use of research evidence to inform decision-making in crisis zones: a user testing study"*, all of my interviews, except one, were conducted with decision-makers not physically present in a crisis zone at the time of the interview. To mitigate this limitation, I purposively sampled key informants who have worked within a crisis zone within the past 12 months. By interviewing a diverse range of key informants, I was able to overcome many of the identified challenges and was enabled to answer the research question of how best to support evidence use in decision-making within crisis zones.

Implications for policy & practice

At the policy level in each of the four systems, there is a need for stated strategic directions that would mandate that research evidence is explicitly considered in decision-making. Without such stated strategic directions, decision-making in crisis zones will continue to rely heavily on professional judgement alone. A number of initiatives exist as examples of this strategic direction. For example, research centers have been established within Ministries of Health, such as the National Health Systems Resource Centre in India, to ensure that research evidence is one input considered in the overall policymaking process (179).

At the practice level, my CIS produced a comprehensive list of strategies to support evidence use within different systems. My case study produced factors that influenced policy-development process, from which strategies can be deduced. My user-testing identified ways to improve the use of evidence. Overall, my strategies offer insights for decision-makers in different systems to reflect on how they can use their positions to support evidence use in crisis zones. Once implemented, my strategies have the potential to support evidence use and thereby will have an impact on the humanitarian aid sector, where there is a need for research evidence to be presented alongside professional judgement.

Future research

While this thesis filled numerous gaps by increasing our understanding of evidence use in crisis zones, an area for future research is to operationalize the strategies to support evidence use over time in multiple systems and to examine their impact. For example, once evidence websites are able to act on the specific suggestions I put forward in my user-testing study, then future research can examine if my specific suggestions contributed to improving access to evidence by decision-makers in crisis zones. In addition, future evaluations should aim to contribute to our understanding of what types of influence each mechanism could be expected to have if successfully implemented in different systems and for different types of crises.

Concluding comments

I argue that supporting evidence use in crisis zones is a multi-faceted approach that requires strategies across and within all systems. Evidence use includes not only the

determination of what evidence is needed to make a decision, but also how to best support the use of that evidence to its full potential. Reflecting on my scholarly journey, I believe that my thesis provided a window into the diverse perspectives and knowledge needs of decision-makers in crisis zones. In addition, my thesis challenged the perceived need for generating new research evidence on crisis zones. The reality is that creating new evidence can be costly and time-consuming, especially given the limited time and resources constraints. While I agree that there are gaps in the existing research evidence on some selected topics, the focus should remain on putting forward strategies that support the use of available research evidence. With the rapid growth in the number of people and organizations working on supporting the use of evidence in crisis zones, I believe that the humanitarian aid field is heading towards a more evidence-informed practice.

References

1.   Ager A, Burnham G, Checchi F, Gayer M, Grais R, Henkens M, et al. Strengthening the evidence base for health programming in humanitarian crises. Science. 2014;345(6202):1290-2.

2.   Blanchet K, Ramesh A, Frison S, Warren E, Hossain M, Smith J, et al. Health in humanitarian crises 1 Evidence on public health interventions in humanitarian crises. 2017.

3.   Blanchet K, Ramesh A, Frison S, Warren E, Hossain M, Smith J, et al. Evidence on public health interventions in humanitarian crises. The Lancet. 2017.

4.   Blanchet K, Roberts B, Sistenich V, Ramesh A, Frison S, Warren E, et al. An evidence review of research on health interventions in humanitarian crises. Final Report. 2013.

5.   Byrne KG, March J, McGuire S, Meissner L, Sperling L. The role of evidence in humanitarian assessment: The seed system security assessment and the emergency market mapping and analysis. Disasters. 2013;37(SUPPL.1):S83-S104.

6.   Chan EY. Evidence-based public health practices: challenges for health needs assessments in disasters. Hong Kong Med. 2006;12(4):324-6.

7.   Musani A, Shaikh I. Preparedness for humanitarian crises needs to be improved. Bmj. 2006;333(7573):843-5.

8.   O'Mathuna DP. Conducting research in the aftermath of disasters: ethical considerations. J Evid Based Med. 2010;3(2):65-75.

9.   Ammar W, Kdouh O, Hammoud R, Hamadeh R, Harb H, Ammar Z, et al. Health system resilience: Lebanon and the Syrian refugee crisis. Journal of global health. 2016;6(2).

10.   Checchi F, Warsame A, Treacy-Wong V, Polonsky J, van Ommeren M, Prudhon C. Public health information in crisis-affected populations: a review of methods and their use for advocacy and action. The Lancet. 2017.

11.   Lavis JN, Oxman AD, Grimshaw J, Johansen M, Boyko JA, Lewin S, et al. SUPPORT Tools for evidence-informed health Policymaking (STP) 7: Finding systematic reviews. Health Research Policy and Systems. 2009;7(1):S7.

12.   Lavis JN, Boyko JA, Oxman AD, Lewin S, Fretheim A. SUPPORT Tools for evidence-informed health Policymaking (STP) 14: Organising and using policy dialogues to support evidence-informed policymaking. Health Research Policy and Systems. 2009;7(1):S14.

13.   Oxman AD, Lavis JN, Fretheim A, Lewin S. SUPPORT Tools for evidence-informed health Policymaking (STP) 17: Dealing with insufficient research evidence. Health Res Policy Syst. 2009;7(1):S17.

14.   Turner T, Green S, Harris C. Supporting evidence-based health care in crises: what information do humanitarian organizations need? Disaster medicine and public health preparedness. 2011;5(1):69-72.

15.   Moat K, Lavis J. Supporting the use of Cochrane Reviews in health policy and management decision-making: Health Systems Evidence. Cochrane Database of Systematic Reviews. 2011(2).

16. Moat K, Lavis J. Supporting the use of research evidence in the Americas through an online" one-stop shop": the EVIPNet VHL. Cadernos de saude publica. 2014;30(12):2697-701.

17. Ellen ME, Léon G, Bouchard G, Lavis JN, Ouimet M, Grimshaw JM. What supports do health system organizations have in place to facilitate evidence-informed decision-making? A qualitative study. Implementation Science. 2013;8(1):84.

18. El-Jardali F, Lavis J, Moat K, Pantoja T, Ataya N. Capturing lessons learned from evidence-to-policy initiatives through structured reflection. Health Research Policy and Systems. 2014;12(1):2.

19. Johnson N, Lavis J. Overview-Procedures Manual for Evaluating Knowledge-Translation Platforms in Low-and Middle-Income Countries. 2011.

20. Hamid M, Bustamante-Manaog T, Dung TV, Akkhavong K, Fu H, Ma Y, et al. EVIPNet: translating the spirit of Mexico. The Lancet. 2005;366(9499):1758-60.

21. Secretariat EA. EVIPNet Americas: informing policies with evidence. The Lancet. 2008;372(9644):1130-1.

22. Lavis JN, Panisset U. EVIPNet Africa's first series of policy briefs to support evidence-informed policymaking. International Journal of Technology Assessment in Health Care. 2010;26(2):229-32.

23. Yehia F, El Jardali F. Applying knowledge translation tools to inform policy: the case of mental health in Lebanon. Health Res Policy Syst. 2015;13(1):29.

24. Lavis JN, Permanand G, Oxman AD, Lewin S, Fretheim A. SUPPORT Tools for evidence-informed health Policymaking (STP) 13: Preparing and using policy briefs to support evidence-informed policymaking. Health Research Policy and Systems. 2009;7(1):S13.

25. Lavis JN, Davies HT, Gruen RL, Walshe K, Farquhar CM. Working within and beyond the Cochrane Collaboration to make systematic reviews more useful to healthcare managers and policy makers. Healthcare Policy. 2006;1(2):21.

26. Haynes RB, Devereaux PJ, Guyatt GH. Physicians' and patients' choices in evidence based practice: Evidence does not make decisions, people do. British Medical Journal Publishing Group; 2002.

27. Lavis J, Davies H, Oxman A, Denis J-L, Golden-Biddle K, Ferlie E. Towards systematic reviews that inform health care management and policy-making. Journal of health services research & policy. 2005;10(1_suppl):35-48.

28. Lavis J, Wilson M, Grimshaw J, Haynes R, Ouimet M, Raina P, et al. Towards Optimally Packaged and Relevance Assessed Health Technology Assessments: Report Submitted to the Canadian Agency for Drugs and Therapeutics in Healthcare. Hamilton, Canada, McMaster University Program in Policy Decision-Making. 2007.

29. Haynes RB, Mulrow CD, Huth EJ, Altman DG, Gardner MJ. More informative abstracts revisited. The Cleft Palate-Craniofacial Journal. 1996;33(1):1-9.

30. Lavis JN, Wilson MG, Oxman AD, Lewin S, Fretheim A. SUPPORT Tools for evidence-informed health Policymaking (STP) 4: Using research evidence to clarify a problem. Health Research Policy and Systems. 2009;7(1):S4.

31.   Research TFoHS. Informed choices for attaining the Millennium Development Goals: towards an international cooperative agenda for health-systems research. The Lancet. 2004;364(9438):997-1003.

32.   Chalmers I. If evidence-informed policy works in practice, does it matter if it doesn't work in theory? Evidence & Policy: A Journal of Research, Debate and Practice. 2005;1(2):227-42.

33.   Oxman AD, Lavis JN, Fretheim A. Use of evidence in WHO recommendations. The Lancet. 2007;369(9576):1883-9.

34.   Lavis JN, Oxman AD, Souza NM, Lewin S, Gruen RL, Fretheim A. SUPPORT Tools for evidence-informed health Policymaking (STP) 9: Assessing the applicability of the findings of a systematic review. Health Research Policy and Systems. 2009;7(1):S9.

35.   Woodward A, Sheahan K, Martineau T, Sondorp E. Health systems research in fragile and conflict affected states: a qualitative study of associated challenges. Health Res Policy Syst. 2017;15(1):44.

36.   Siriwardhana C, Adikari A, Jayaweera K, Sumathipala A. Ethical challenges in mental health research among internally displaced people: ethical theory and research implementation. BMC medical ethics. 2013;14(1):13.

37.   Zwi AB, Grove NJ, Mackenzie C, Pittaway E, Zion D, Silove D, et al. Placing ethics in the centre: Negotiating new spaces for ethical research in conflict situations. Global Public Health. 2006;1(3):264-77.

38.   Leaning J. Ethics of research in refugee populations. The Lancet. 2001;357(9266):1432-3.

39.   Goodhand J. Research in conflict zones: ethics and accountability. Forced Migration Review. 2000;8(4):12-6.

40.   Yamout R, Jabbour S. Complexities of research during war: Lessons from a survey conducted during the summer 2006 war in Lebanon. Public Health Ethics. 2010;3(3):293-300.

41.   Black R. Ethical codes in humanitarian emergencies: from practice to research? Disasters. 2003;27(2):95-108.

42.   Thabet AAM, Abed Y, Vostanis P. Emotional problems in Palestinian children living in a war zone: a cross-sectional study. The Lancet. 2002;359(9320):1801-4.

43.   Barakat S, Ellis S. Researching under fire: issues for consideration when collecting data and information in war circumstances, with specific reference to relief and reconstruction projects. Disasters. 1996;20(2):149-56.

44.   Innvaer S, Vist G, Trommald M, Oxman A. Review article Health policy-makers' perceptions of their use of evidence: a systematic review. Policy. 2002;7.

45.   Lavis JN, Ross SE, Hurley JE. Examining the role of health services research in public policymaking. The Milbank Quarterly. 2002;80(1):125-54.

46.   Jewell CJ, Bero LA. "Developing good taste in evidence": facilitators of and hindrances to evidence-informed health policymaking in state government. The Milbank Quarterly. 2008;86(2):177-208.

47.   Hyder AA, Corluka A, Winch PJ, El-Shinnawy A, Ghassany H, Malekafzali H, et al. National policy-makers speak out: are researchers giving them what they need? Health policy and planning. 2010;26(1):73-82.

48.   Harries U, Elliott H, Higgins A. Evidence-based policy-making in the NHS: exploring the interface between research and the commissioning process. Journal of Public Health. 1999;21(1):29-36.
49.   Organization WH. Changing Mindsets: Strategy on Health Policy and Systems Research. 2012.