Rapid response

Knowledge translation mechanisms to translate evidence into public health policy in emergencies

Knowledge translation is "the synthesis, exchange, and application of knowledge by relevant stakeholders to accelerate the benefits of global and local innovation in strengthening health systems and improving people’s health".

World Health Organization

2006
Rapid response

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Key messages

**Question:** “What knowledge translation mechanisms have been used in emergencies to translate evidence to policy-makers and to increase evidence uptake in public policies?”

**Background**

This rapid response summarizes global research evidence drawn from many sources in the research literature, mainly systematic reviews. It does not contain recommendations, which would have required the authors to make judgements based on personal values and preferences.

This rapid response seeks to respond to the scientific information needs of politicians and policy-makers to tackle this pandemic. A distinctive feature of this process is the use of systematic and explicit methods to identify, select, appraise and synthesize data and information from the included studies. This rapid response was conducted over 15 business days and presents evidence for policy-makers in a concise and comprehensible manner.

**Why this issue is important**

- Knowledge translation processes provide diverse tools for researchers and decision-makers to promote evidence-informed policies.
- Humanitarian emergencies and infectious disease pandemics challenge governments and, above all, test the capabilities of health systems.
- Time constraints are an inevitable barrier to the use of evidence in decision-making during a crisis or emergency.
- Existing evidence often has to compete with an abundance of poor-quality information, and new evidence must be rapidly produced to fill knowledge gaps for effective policy-making.

**What evidence and information were considered**

This rapid response identified a total of 15 systematic reviews of individual studies. Fourteen reviews were of low quality and one was of high quality.
Key findings

- The overall findings indicated that scientific evidence is critical to managing infectious disease outbreaks but must compete with a wide range of other factors that influence decision-making. Four main knowledge translation strategies were identified to increase evidence uptake into policy-making: push mechanisms, pull mechanisms, exchange efforts and integrated strategies.

- Six reviews reported push mechanisms, including the use of targeted messaging to present and disseminate routinely collected health information, data and research evidence to potential policy-makers. Knowledge translation platforms were found to increase the use of evidence in policy-making.

- Eleven reviews reported pull mechanisms (single or combinations) which are led by research users, including dissemination via stakeholders and knowledge brokers (also called knowledge facilitators); providing skills training and education for decision-makers through web portals, advice and organizational support; and prioritizing research focused on the needs of policy-makers.

- Twelve reviews reported different types of exchange effort, including information exchange between government agencies and/or between jurisdictions, and collaborative approaches between researchers and policy-makers. Promoting the involvement of community leaders could improve adherence to evidence-informed policies.

- Only three reviews reported integrated strategies, including multiple interventions with a range of different components and targeting various groups involved in the emergency response to improve the use of evidence in policy decisions. However, little evidence was found to support the use of such strategies.

Policy considerations

The main barriers to knowledge translation are scientific uncertainty, institutional and legal structures, the media, political factors, and private sector interests. Based on the findings of the review, the main policy considerations to improve knowledge translation in low- and middle-income countries are to:

- strengthen the capacity for local research;

- provide training to improve the skills of decision-makers to interpret and understand scientific evidence;

- engage stakeholders (including the community) in decision-making to promote the exchange of information between policy-makers and the chain of command;

- disseminate evidence in the form of short synthesis documents with a simple format and easy-to-understand language; and

- consider using different strategies to support translating research evidence to policy decisions: push mechanisms, pull mechanisms, exchange efforts and integrated strategies.
During emergencies, policy-makers need to make urgent decisions to implement adequate response measures in a rapidly changing situation on the basis of limited and, at times, contradictory information. Under these circumstances, knowledge translation mechanisms are invaluable to support the use of evidence in decision-making.

In response to a mandate of the Fifty-eighth World Health Assembly to strengthen knowledge sharing to support evidence-informed health policies, WHO defined knowledge translation as “the synthesis, exchange, and application of knowledge by relevant stakeholders to accelerate the benefits of global and local innovation in strengthening health systems and improving people’s health” (1,2). WHO later defined knowledge translation in the area of public health as “the dynamic interface that links health information and research with policy and practice ... [provides] an array of tools to researchers and decision-makers to foster EIP (evidence-informed policy)” (3).

Humanitarian emergencies, in particular pandemics caused by infectious agents, are challenging for governments and, above all, test health systems capabilities. They can be classified into three broad categories: (i) natural disasters, (ii) technological disasters (e.g. hazardous material spills, nuclear accidents or chemical explosions) and (iii) conflict-related emergencies (including civil conflict, civil war and international war), also known as complex emergencies. They can be sudden onset, such as earthquakes or pandemics, or slow onset, such as droughts (4). Furthermore, many threats to public health, such as infectious diseases, are invisible and do not respect national borders and so requiring coordinated efforts to contain and eliminate them.

The response to public health emergencies includes several phases: incident characterization, risk assessment, response measures and, finally, policy decisions (5). Consequently, information and knowledge are necessary but insufficient for an evidence-informed response to an emergency or disaster (6). Routine public health information can be obtained from health information systems, which record the population’s health status and monitor public health risks, diseases and the performance of the health system. In addition, evidence to inform the development of health policies is generated by national health information systems and public health research (3).

Standard preparedness and response activities must be regularly revised to address new health threats, which may be exacerbated by public mistrust and misinformation, as seen in vaccine hesitancy (6) and in the current SARS-CoV-2 (COVID-19) pandemic (7). In emergencies, high-level decision-makers may delegate much of the public health decision-making to pre-existing groups or newly created groups (intermediaries or advisory committees), who make recommendations based on information, knowledge and/or evidence (8,9). This arrangement has been seen in many countries during the current COVID-19 pandemic and previously in other health emergencies (9,10).

An important issue is the gap between evidence and policy. The bigger the crisis, the more research is produced; this makes it more difficult for policy-makers to identify useful and reliable evidence for decision-making. Public health emergencies present three main challenges to evidence-informed decision-making: (i) obstacles or barriers (e.g. uncertainty about risks and...
insufficient treatments, or public mistrust of the government, which has the ultimate responsibility to decide about response measures); (ii) variable views of decision-makers on the acquisition, interpretation and application of evidence; and (iii) constraints on considering the available evidence in decision-making (due to competing demands and the complex nature of public health emergencies) (5). However, few studies have examined evidence use in decision-making to manage public health emergencies (5).

Public health crises offer governments the opportunity to develop knowledge transfer partnerships. Knowledge translation platforms support information exchange between researchers and decision-makers to promote behavioural change and support evidence-informed policy-making in public health emergencies (such as the COVID-19 pandemic). These platforms can bridge the gaps between research, politics, practice and policy-making (10).

Methods overview

The rapid response goes through the following methodological steps during preparation.

Formulation of a clear rapid response question: “What knowledge translation mechanisms have been used in emergencies to translate evidence to policy-makers and increase evidence uptake in public policies?”

Identification of evidence: evidence relevant to COVID-19, or outbreaks due to coronaviruses, and other emergencies and disasters mainly included systematic reviews and technical reports, policy documents and other sources of relevant information, usually grey literature.

Search for studies: used Embase, Epistemonikos, PubMed, COVID-19-specific libraries, including LitCovid (United States National Library of Medicine), the WHO database of global literature on coronavirus disease (COVID-19), the Coronavirus (COVID-19) Cochrane resources and McMaster PLUS. For the grey literature and technical documents, Google Scholar and OpenGrey were searched (Annex 1).

Selection and quality evaluation process: the identified documents were assessed for inclusion by one author, with doubts resolved by discussion and agreement between both authors. Studies were included if they were systematic reviews with a focus on knowledge transfer mechanisms to inform policy for health emergencies and for humanitarian crises that include health. Studies were excluded if they focused exclusively on humanitarian emergencies that do not include a public health component or assessed interventions directed exclusively to managers who are not involved in policy-making. The quality of included systematic reviews was evaluated with the AMSTAR (A MeaSurement Tool to Assess systematic Reviews) II tool. Annex 2 lists the 15 included studies, Annex 3 those excluded and Annex 4 the quality evaluation.
Methods overview contd

**Data extraction and synthesis:** for each included systematic review, data were extracted on the focus of the review, date of the literature search, AMSTAR score, number and type of included studies, populations, intervention types, country(ies) and key findings, including policy considerations. Annex 5 summarizes the findings.

**Narrative synthesis:** the extracted information was used to develop a narrative synthesis of the key findings from the included studies.

**Limitations:** this rapid review used systematic review methods adapted to suit the 15-day drafting timeline. It includes only English language studies. Although COVID-19 was the intended focus of the review, most of the evidence did not directly relate to COVID-19.

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**Magnitude of the problem and its severity**

The current COVID-19 pandemic is associated with rapid and major changes in behaviour by individuals, institutions and the whole of society. Evidence to guide the direction of these changes is evolving rapidly, which increases the level of uncertainty for decision-makers. In addition to the huge body of relevant literature, the specific literature on COVID-19 is increasing, but many studies have been minimally reviewed or are yet to undergo peer review. Similarly, guidance from public health authorities and media messaging may be inconsistent or quickly replaced/supplemented by new guidance. Despite this, some decision-makers seem prepared to make radical decisions during the COVID-19 crisis (11). Under these circumstances, decision-makers may find it difficult to consider scientific evidence alongside the wide range of other factors that influence decision-making.

Time constraints for decision-making are an inevitable barrier to the use of evidence during a crisis or emergency. Due to the rapid development and complexity of public health emergencies, decision-makers are under pressure to respond urgently and strategically to meet public health needs (and to demonstrate their ability to meet public health needs) (6). However, they may struggle to achieve this while retaining public confidence. For example, in the Fukushima nuclear accident of 2011, miscommunication of the potential risk to the Japanese population quickly led to public mistrust of Government information such that many people living in the Tokyo area based their decisions on risk assessments from other countries (8).

Scientific uncertainty is a major problem for decision-making during public health emergencies. However, other factors that influence decision-making include previous experiences of emergencies, relationships between key stakeholders, the media, the political climate, the social context and the reputation of decision-makers (12). When a country makes a decision during a public health emergency, it puts pressure on neighbouring countries to do the same (13): the COVID-19 pandemic is an ongoing example. However, the same evidence can lead to different advice in neighbouring countries, as seen, for example, during the 2009 H1N1 influenza (H1N1 pdm09 virus) pandemic (6). This may occur because political leaders want to avoid blame or protect their reputation, or through interested organizations seeking economic benefits or experts seeking to give the “correct” response (6). Furthermore, it is difficult to assess the extent to which
Evidence is driving policy decisions due to the general complexity of public health emergencies (12). To bridge the gap between research and policy, researchers and decision-makers must be helped to understand each other’s needs (5).

Furthermore, epidemics may include several vulnerabilities. For example, geographical and climate vulnerabilities that impact public health may be aggravated by the development and political characteristics of a region. A study analysing the implications of overlapping complex emergencies in response to disasters and natural epidemics identified the 30 worst natural calamities, epidemics and complex emergencies during the decade from 1995 to 2004, based on the estimated mortality associated with each event. Most of the worst natural disasters occurred in Asia and most of the worst epidemics occurred in Africa. Even though other regions of the world have also experienced calamities and natural epidemics, the research evidence indicates that those occurring in Europe or North America have been far less severe in terms of scope and ramifications than those in Asia and Africa. One positive finding is that both the quantity and the quality of research into the effectiveness of health interventions in humanitarian crises has increased significantly over the last decade (6).

Information gaps and uncertainties
In general, decision-making is not a linear process, but the path may become more complex during emergencies and public health crises. Demands of decision-makers for scientific knowledge may vary depending on cultural context, availability of resources or the specific phase of crisis management (5,10). Political decision-making in new public health emergencies can be hampered by uncertainty because the available scientific evidence is scarce, irrelevant or ambiguous. Where the available scientific evidence is uncertain, decision-makers may resist using the best available evidence and revert to preparedness plans or precautionary actions. The limited existing evidence suggests that crisis management decisions are not always evidence informed, which can lead to public mistrust. In turn, public criticism and scrutiny may lead to political decision-making that is not evidence informed (9,12,13). To improve the impact of scientific evidence on public health preparedness and response, a better understanding is needed of the mechanisms that feed evidence into the decision-making processes and of the context in which these mechanisms work. International sharing of scientific data and expertise is pivotal to resolving an emergency (9). Many decisions related to COVID-19 have presupposed similarities with other pandemics (12).

Consequences of failing to address the problem
Without effective knowledge translation to decision-makers, scientific evidence may have a marginal influence on policy-making, particularly when in competition with other factors. During public health emergencies, scientific evidence can provide insight to enable progress towards better outcomes (reduced morbidity and mortality) and reduce the cost of relief efforts. As such, policy-makers have a moral obligation to use knowledge and evidence to ensure the best possible humanitarian response to a crisis (3); ignoring the evidence can exacerbate the crisis (14,15). During a humanitarian response, decision-makers may prefer to rely on their professional judgement to provide support to people affected by the crisis. Part of the challenge in persuading decision-makers to also consider research evidence is overcoming their uncertainty that the existing evidence is relevant to their local context (16). Knowledge translation platforms recognize that a one-size-fits-all response to public health crises is not appropriate. They offer context-specific evidence to enable countries to tailor global solutions to their local problems (10). Specific
strategies are lacking to leverage facilitators and address barriers within different systems (e.g. politics and health) to support the use of evidence in decision-making in crisis zones (16).

In the current COVID-19 pandemic, policy-makers must also address the infodemic.\(^1\) It is important that they work with the media to communicate the risks and control measures in order to "better understand what they should be looking for, because the media sometimes gets ahead of the evidence" (17).

\(^1\) Defined as a rapid spread of all kinds of information concerning a problem such that the solution is made more difficult (17).
Methodology

The approach to identifying, selecting, evaluating and synthesizing evidence is detailed in Box 2 and Annexes 1–5. Annex 6 is a glossary of the methodological terms used in this document.

What evidence and information were considered?
The main sources of information considered were systematic reviews (Annexes 1–3 outline the search strategy, the included studies and the excluded studies, respectively). Fifteen systematic reviews of individual studies (16,18–31) were included. All reviews were published between 2010 and 2020. One review was available as a preprint only in 2020 and had not been peer reviewed (20). One review was of high quality (21) and all others were of low quality (Annex 4). Reviews related to emergencies, humanitarian crises and disasters were considered direct evidence. Indirect evidence came from reviews directed to other topics (e.g. various medical and nonmedical conditions in low- and middle-income countries or in a particular cultural context) that also considered infectious disease outbreaks, humanitarian crises or disasters. Only two reviews specifically addressed COVID-19 or pandemics (20,30). The other 13 reviews included infectious disease outbreaks among other emergency crises or disasters.

The findings were categorized into four knowledge translation strategies (32): (i) push mechanisms; (ii) pull mechanisms, (iii) exchange efforts and (iv) integrated strategies (Box 1).

Most of the included studies reported more than one knowledge translation strategy or approach, so were included in multiple categories. Only three of the 15 reviews included a single strategy (19,20,25). None of the reviews reported measures of the effects of specific interventions in terms of behavioural change or knowledge uptake by decision-makers.

Box 1. Push, pull, exchange and integrated models of knowledge translation

- Push mechanisms are led by researchers, intermediary groups or knowledge brokers, and typically involve providing information to research users.

- Pull mechanisms are led by evidence users, who request information and/or research evidence based on their needs.

- Exchange efforts involve short- or long-term partnerships between researchers and evidence users for mutually beneficial collaboration.

- Integrated strategies include elements of push, pull and exchange mechanisms in large-scale knowledge translation platforms that work to connect policy needs with research tools.

Key findings

**Narrative summary**

**Push mechanisms**
Six reviews reported push mechanisms (16,19,21,22,26,29). The mechanisms included making evidence available for emergency planning, community engagement tools (including participatory action research), dissemination of evidence summaries (such as systematic reviews and policy documents), dissemination strategies (e.g. specific fund allocation, organization of congresses and forums, distribution of targeted newsletters, and specific websites), and web-based information and communication strategies, including portals.

One low-quality review of the use of evidence in emergency planning found that the validity and generalizability of existing evidence was unclear and evidence mostly focused on emergency planning and response (rather than mitigation) (19). Only one study focused on hazard analysis and mitigation (19).

**Pull mechanisms**
Eleven reviews reported different pull mechanisms, either alone or combined (16,20–22,24,26–31). Mechanisms used to promote and facilitate the use of knowledge in policy-making included synthesizing the available evidence grouped by technical analysis to facilitate its use by policy-makers, involving stakeholders (i.e. researchers and academics) and knowledge brokers in evidence dissemination; providing advice and organizational support to promote capacity-building to formulate evidence-informed policies; setting research priorities to address knowledge gaps; and delivering training and education through web-based portals.

One low-quality review focused on COVID-19 prevention and mitigation strategies found that public health campaigns lacked a sufficient evidence base and that policymakers should request relevant evidence when planning such initiatives (20).

**Exchange efforts**
Twelve reviews reported different types of exchange effort (16,21–31). The mechanisms included information exchange between government agencies and/or between jurisdictions to integrate evidence into the preparation of national and international public health emergency risk communications. Collaborative approaches included employing knowledge brokers to promote knowledge exchange between researchers and decision-makers and the use of research evidence in decision-making. Specific culturally sensitive mechanisms included involvement of an Inuit community in sharing the results of health research in this population (25).

**Integrated strategies**
No reviews specifically focused on integrated strategies, but three reviews included this type of strategy, among others (16,23,30). The mechanisms included integrating evidence use at different levels of decision-making and services to develop emergency risk communication, coordinating communication activities across response levels between different response agencies, and promoting collaboration between policymakers and researchers via policy dialogues (also called stakeholder dialogues).
One review found that decision-makers may face political pressure to follow preparedness plans and need supporting research evidence to explain why the emergency response diverged from the plans. However, politicians may follow expert advice to avoid blame. Therefore, knowledge translation processes must take account of political factors in addition to scientific uncertainty, institutional and legal structures, and the media (30).

Another review highlighted ways that different actors could use their professional influence to promote the wider use of evidence in decision-making in humanitarian crises (16). It suggested that government policy-makers could engage health system researchers in developing new or adapting existing strategies to facilitate policy dialogues to generate the evidence needed by decision-makers (16). At the organizational level, centres of research, practice and policy could be established to shape policy-making for emergencies, humanitarian crises and disasters. As an example, the Knowledge to Policy Center (at the American University of Beirut) facilitates the integration of research evidence into local and global public health and social policy-making. The review could not determine how the local context influences the success of integrated strategies in crisis zones. However, strategies such as policy dialogues to inform policy are easier to convene in relatively stable neighbouring countries, rather than in countries affected by emergencies or disasters, facing extreme poverty or with unstable governments (16).

The third review emphasized that organizational flexibility (e.g. leadership structure) and the legislative context (e.g. amending restrictive laws/regulations) are critical factors for emergency risk communication (23).

**Potential barriers**

**Economic context.** A high-quality review of interventions to improve the use of health research evidence in policy-making in low- and middle-income countries found important barriers, including lack of funding and resources, difficulties engaging with stakeholders (including communication problems), high staff turnover rates (especially policy-makers), lack of local data, and use of inadequate dissemination methods (21). In contrast, in low-income countries, dependence on the support of large multilateral organizations was identified as a barrier because priority-setting may focus on external, rather than local, factors.

**Organizational context.** One low-quality review identified national/international organizational and legal structures as barriers to effective decision-making during infectious disease outbreaks because they had hampered coordination and collaboration. Complex bureaucratic structures were reported to inhibit information flow and, consequently, delay the response (30). In the United States of America, structural and legal barriers hampered the coordination of decision-making processes between different levels of governance (federal and state) (30).

**Local context.** A review of nonpharmaceutical interventions in the current COVID-19 pandemic and infectious disease outbreaks found that the effectiveness of information dissemination (via public information campaigns) and decision-making varied according to the local context and disease characteristics (20). The availability of local data was identified as an essential factor in public health emergency planning (24). Consequently, lack of quality scientific evidence focused on the local context is a barrier to emergency planning and policy-making (19,24,31).
**Time constraints.** Lack of time for researchers to adequately communicate scientific evidence or a need for urgent decisions by policy-makers are barriers to interactions between these groups (22,26).

**Barriers for decision-makers.** Political and personal factors can be barriers to the use of evidence by decision-makers (21). A lack of the skills needed to interpret research data (or training to develop these skills) in decision-makers can be a barrier to evidence use in policy-making (16,26).

**Conflicting perspectives.** Conflicting attitudes, beliefs and models of leadership can also be barriers for communication between policy-makers and researchers (26,28).

**Resilience.** A review of public health emergency preparedness identified resilience (i.e. the ability of individuals and systems to recover after an emergency) as a knowledge gap (24).
Policy considerations

The main barriers to knowledge translation are scientific uncertainty, institutional and legal structures, the media, political factors and private sector interests. The findings and barriers of knowledge translation strategies are summarized in Table 1. Based on the findings of the review, the main policy considerations to improve knowledge translation, especially in low- and middle-income countries, are as follows.

- Strengthen the development of local research to fill knowledge gaps, including through creating innovative integrated funding mechanisms to enable research to be combined with humanitarian aid interventions.
- Use simulation tools to generate high-quality research evidence on managing disasters and emergencies.
- Disseminate the available scientific evidence to policy-makers in the form of short synthesis documents with a simple format and easy-to-understand language.
- Engage stakeholders and promote community participation to improve information exchange between policy-makers and the emergency response teams.
- Use integrated strategies that combine push mechanisms, pull mechanisms and exchange efforts to support knowledge translation into policy.

**Push mechanisms**

- Knowledge translation into policy-making is effective when the evidence provides solutions to problems on the national and global development agenda and is disseminated through a policy network with strong leadership (22).
- Evidence synthesis documents are a simple and accessible way to summarize research evidence (22).
- National/regional knowledge exchange platforms can provide integrated access to relevant data and resources for sharing and distributing information, and facilitate knowledge sharing (29). These could be used combined to create a global humanitarian platform for accessing health data.

**Pull mechanisms**

- Knowledge brokers can ensure the timely delivery of relevant, high-quality evidence to decision-makers responding to humanitarian crises (16).
- Barriers include the attitudes and beliefs of leaders, lack of collaboration and system integration, and inadequate communication (24). Skills training and exercises can help decision-makers to interpret and use scientific evidence to fill knowledge gaps.
Policy-makers are likely to prioritize research that will provide evidence to meet key targets of global development goals.

**Exchange efforts**

- Engagement between research organizations and government bodies and collective action by civil society organizations can support the use of scientific evidence in policy-making.

- Knowledge exchange strategies can ensure that research is undertaken to address specific policy questions and the results are disseminated to decision-makers and applied to improve policy and practice. This requires a commitment by stakeholders to compromise and collaboration and may involve knowledge brokers.

- Key elements to enhance information sharing and coordination include:
  - creating networks, taskforces and committees across disciplines, organizations and geographical areas;
  - a culturally respectful approach to engagement with local communities and stakeholders (22,25); and
  - sharing information up and down the incident command system (23).

**Integrated strategies**

- Combining a variety of strategies may seem an obvious approach, but limited evidence was found to support this option (16,23,30).

- Essential elements for adopting this approach are organizational flexibility, adaptability of decision-makers (23) and the context (local and legislative) (16).

- Engaging researchers in policy dialogues can help to address the needs of decision-makers and inform policy options. Different actors can reflect on how best to use their professional position to support the use of evidence in decision-making.
## Table 1. Summary of findings and barriers by intervention type

<table>
<thead>
<tr>
<th>Knowledge translation strategy</th>
<th>Findings based on knowledge translation strategy</th>
<th>Potential barriers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Push mechanisms</strong></td>
<td>Seven reviews (six of low quality and one of high quality) reported push mechanisms (16,19,21,22,26,29)</td>
<td>Three reviews of low quality described potential barriers to the use of push mechanisms (16,19,22):</td>
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<tr>
<td></td>
<td><strong>Evidence collection and dissemination.</strong> Providing regular updates on the available evidence can reduce knowledge gaps and help to inform policy-makers (19,26)</td>
<td>• inadequacy of communication and evidence-sharing strategies (16)</td>
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<tr>
<td></td>
<td><strong>Routine collection of health data.</strong> Local data gives contextual information for decision-making (21)</td>
<td>• low quality of available evidence (19)</td>
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<td></td>
<td><strong>Policy briefs.</strong> Evidence summaries can help decision-makers to quickly assimilate key research findings to solve policy problems (16,22)</td>
<td>• researchers lack sufficient time to communicate their findings in a targeted manner (22)</td>
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<td></td>
<td><strong>Knowledge exchange portals.</strong> Increased access to knowledge via portals, combined with tailored and targeted messaging, can increase the use of evidence in policy-making (29)</td>
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<tr>
<td><strong>Pull mechanisms</strong></td>
<td>Eleven reviews (all of low quality) reported research user-led strategies (16,20–22,24,26–31)</td>
<td>Five reviews of low quality described potential barriers to the use of pull mechanisms (16,22,26,28,30):</td>
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<td></td>
<td><strong>Dissemination strategies.</strong> Engaging knowledge brokers and researchers in information sharing may facilitate the formulation of evidence-informed policies (16,22,27,31)</td>
<td>• lack of regulatory authority to prevent conflicts of interests in research evidence; existing evidence does not meet the needs of decision-makers (16)</td>
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<td></td>
<td><strong>Organizational support.</strong> May be effective in prioritizing research focused on the needs of policy-makers (22)</td>
<td>• lack of skills to interpret research evidence (16,26)</td>
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<td></td>
<td><strong>Training and education.</strong> Web portals can be used to provide skills training for policy-makers in the use of evidence (30)</td>
<td>• lack of credible local data and health statistics (22)</td>
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<td></td>
<td></td>
<td>• poor interaction between researchers and policy-makers (26)</td>
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<td></td>
<td></td>
<td>• attitudes, beliefs of decision-makers and models of leadership could be communication barriers (26,28)</td>
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<tr>
<td></td>
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<td>• bureaucratic or inefficient local organizations (26,30)</td>
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### Findings based on knowledge translation strategy

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<tr>
<th>Knowledge translation strategy</th>
<th>Findings based on knowledge translation strategy</th>
<th>Potential barriers</th>
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</table>
| **Exchange efforts**          | Twelve reviews (one of high quality and 11 of low quality) suggested different types of exchange effort, but many were focused on evidence integration for emergency risk communication (16,21–31) | Three reviews of low quality described potential barriers to the use of exchange efforts (16,25,28):  
- failure to collaborate hinders evidence collection and sharing (16)  
- failure to assess the benefits of community involvement in research (25)  
- lack of coordination among key participants in education/training programmes (28)  
None of the reviews described specific barriers to this strategy |
|                              | **Information exchange.** Exchange between government agencies and/or between jurisdictions can improve emergency risk communication (27)  
**Collaboration.** Partnerships between researchers and decision-makers can improve the relevance of research evidence (21,24)  
**Use of knowledge brokers.** Brokers (e.g., consultants, advisors) can promote collaboration between government officials and outside facilitators (21)  
**Community involvement.** A culturally respectful approach involving community leaders may improve adherence to evidence-informed policies (25) | |
| **Integrated strategy**       | Three low-quality reviews included integrated strategies (16,23,30) | None of the reviews described specific barriers to this strategy |
|                              | **Four systems framework.** A conceptual framework (politics, health services, humanitarian aid and health research) can help in understanding the facilitators and barriers and planning appropriate actions for each system (16)  
**Multiple interventions.** Coordinated action across a variety of stakeholder groups (e.g., policy dialogues and involving researchers in decision-making) can increase the use of evidence in policy decisions (16,23,30) | |
References


Knowledge translation mechanisms to translate evidence into public health policy in emergencies


Annex 1. Search strategy

Searches were carried out from 10 to 15 November 2020. Biblioteca Virtual en Salud LILACS, Cochrane Library, Epistemonikos, Health Systems Evidence, and PubMed were initially searched for relevant evidence (systematic reviews or meta-analyses). These searches yielded low-quality results, so an Embase (Ovid) search, a search of specific COVID-19 databases and handsearching of Google and Google Scholar were carried out. Out of 1932 documents, 16 were finally included in the synthesis (Fig. 1).

### Search strategies

#### PubMed

<table>
<thead>
<tr>
<th>Search strategy</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>(&quot;knowledge transl*&quot;[Title/Abstract]) OR (KT[Title/Abstract]) OR (&quot;knowledge exchange&quot;[Title/Abstract]) OR (&quot;knowledge mobilisation&quot;[Title/Abstract]) OR (&quot;knowledge mobilization&quot;[Title/Abstract]) OR (&quot;research utilisation&quot;[Title/Abstract]) OR (&quot;research utilization&quot;[Title/Abstract]) OR (&quot;evidence-based decision&quot;[Title/Abstract]) OR (&quot;translation-al medical research&quot;[MeSH Terms]) OR (&quot;decision-mak*&quot;[Title/Abstract]) OR (&quot;decision mak*&quot;[Title/Abstract]) OR (&quot;evidence-informed&quot;[Title/Abstract]) OR (&quot;implementation science&quot;[MeSH Terms]) OR (&quot;evidence-policy gap&quot;[Title/Abstract]) OR (&quot;information dissemination&quot;[Title/Abstract]) OR (&quot;diffusion of innovation&quot;[Title/Abstract]) OR (&quot;evidence-informed&quot;[Title/Abstract]) OR (&quot;policy&quot;[Title/Abstract]) OR (&quot;policies&quot;[Title/Abstract]) OR (&quot;policy mak*&quot;[Title/Abstract]) OR (&quot;policy-mak*&quot;[Title/Abstract]) OR (&quot;health policy&quot;[Title/Abstract]) OR (&quot;health policy&quot;[MeSH Terms]) AND ((&quot;coronavirus&quot;[MeSH Terms]) OR (&quot;coronavirus infections&quot;[MeSH Terms]) OR (&quot;coronavirus*&quot;[Title/Abstract]) OR (&quot;COVID-19&quot;[Title/Abstract]) OR (&quot;SARS-CoV-2&quot;[Title/Abstract]) OR (&quot;pandemics&quot;[MeSH Terms]) OR (&quot;pandemic&quot;[Title/Abstract]) OR (&quot;outbreak&quot;[Title/Abstract]) OR (&quot;Communicable Diseases&quot;[MeSH Terms]) OR (&quot;epidemics&quot;[MeSH Terms]) OR (&quot;MERS&quot;[Title/Abstract]) OR (&quot;SARS&quot;[Title/Abstract]) OR (&quot;Ebola&quot;[Title/Abstract]) OR (&quot;H1N1&quot;[Title/Abstract]) OR (&quot;swine flu&quot;[Title/Abstract]) OR (&quot;emergencies&quot;[MeSH Terms]) OR (&quot;humanitarian emergency&quot;[Title/Abstract]) OR (&quot;emergency response&quot;[Title/Abstract]) OR (&quot;emergency relief&quot;[Title/Abstract]) OR (&quot;health emergency&quot;[Title/Abstract]) OR (&quot;emergencies&quot;[Title/Abstract]) OR (&quot;disaster&quot;[Title/Abstract]) OR (&quot;humanitarian crisis&quot;[Title/Abstract]) OR (&quot;crisis response&quot;[Title/Abstract]) OR (&quot;tsunami&quot;[Title/Abstract]) OR (&quot;earthquake&quot;[Title/Abstract]) OR (&quot;flood&quot;[Title/Abstract]) OR (&quot;avalanche&quot;[Title/Abstract]) OR (&quot;landslide&quot;[Title/Abstract]) OR (&quot;cyclone&quot;[Title/Abstract]) OR (&quot;hurricane&quot;[Title/Abstract]) OR (&quot;typhoon&quot;[Title/Abstract]) OR (&quot;volcanic eruption&quot;[Title/Abstract]) OR (&quot;drought&quot;[Title/Abstract]) OR (&quot;famine&quot;[Title/Abstract]) OR (&quot;radioactive&quot;[Title/Abstract]) OR (&quot;war&quot;[Title/Abstract]) OR (&quot;Armed Conflicts&quot;[MeSH Terms]) OR (&quot;armed conflict&quot;[Title/Abstract])) Filters: Systematic reviews. 2000–2020</td>
<td>360</td>
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</table>

#### Biblioteca Virtual en Salud LILACS

<table>
<thead>
<tr>
<th>Search strategy</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>(tw:(&quot;information dissemination&quot;)) OR (tw:(&quot;diffusion of innovation&quot;)) OR (tw:(&quot;knowledge generation&quot;)) OR (tw:(&quot;knowledge translation&quot;)) OR (tw:(&quot;knowledge uptake&quot;)) OR (tw:(&quot;knowledge exchange&quot;)) OR (tw:(&quot;knowledge broker$&quot;)) OR (tw:(&quot;knowledge mobilisation&quot;)) OR (tw:(&quot;knowledge mobilization&quot;)) OR (tw:(&quot;research uptake&quot;)) OR (tw:(&quot;research use&quot;)) OR (tw:(&quot;use of research&quot;)) OR (tw:(&quot;evidence informed&quot;)) OR (tw:(&quot;evidence-informed&quot;)) OR (tw:(&quot;decision making&quot;)) OR (tw:(&quot;decision-making&quot;)) OR (tw:(&quot;research utilisation&quot;)) OR (tw:(&quot;research utilization&quot;)) OR (tw:(&quot;technology transfer&quot;)) OR (tw:(&quot;knowledge-to-action&quot;)) OR (tw:(&quot;knowledge to action&quot;)) OR (tw:(&quot;implementation science&quot;)) AND (mh:&quot;disaster emergencies&quot;) OR (mh:&quot;medicine disaster&quot;) OR (mh:&quot;earthquakes&quot;) OR (mh:&quot;tsunamis&quot;) OR (mh:&quot;disaster planning&quot;) OR (mh:&quot;emergencies&quot;) OR (mh:&quot;outbreaks&quot;) OR (mh:&quot;pandemics&quot;) OR (mh:&quot;coronavirus infections&quot;) OR (mh:&quot;disease outbreaks&quot;)) Filters: systematic review and systematic review of observational articles (excluded MEDLINE). 2000–2020</td>
<td>19</td>
</tr>
</tbody>
</table>
Search strategies

Cochrane Library

#1. (“Information dissemination” OR “diffusion of innovation” OR “knowledge generation” OR “knowledge translation” OR “knowledge transfer”):ti,ab,kw (word variations were searched)

#2. (“knowledge uptake” OR “knowledge exchange” OR knowledge next broker” OR knowledge next mobilization OR “research uptake”) OR (research near/2 use OR evidence-informed OR decision-making OR research next utilization OR technology next transfer) OR (knowledge-to-action OR implementation next science) AND (coronavirus OR COVID-19 OR pandemic? OR outbreak? Epidemic? OR MERS OR SARS? OR Ebola OR H1N1 OR “swine flu?” OR emergency? OR “health emergency” OR disaster? OR “humanitarian crisis” OR “crisis response” OR tsunami OR earthquake OR flood OR avalanche OR landslide OR cyclone OR hurricane OR typhoon OR “volcanic eruption” OR drought OR radioactive OR war OR “armed conflict”)

Health Systems Evidence

(Information dissemination OR diffusion of innovation OR knowledge generation OR knowledge translation OR knowledge transfer OR knowledge uptake OR knowledge exchange OR knowledge broker OR knowledge mobilisation OR knowledge mobilization OR research uptake OR research use OR use of research OR evidence informed OR evidence-informed OR decision making OR decision-making OR research utilisation OR research utilization OR technology transfer OR knowledge-to-action OR knowledge to action OR technology transfer OR evidence-informed OR knowledge mobilization) AND (disaster OR outbreaks OR pandemics OR coronavirus OR disease outbreaks) Limits: systematic reviews

Epistemonikos

(Information dissemination OR diffusion of innovation OR knowledge generation OR knowledge translation OR knowledge transfer OR knowledge uptake OR knowledge exchange OR knowledge broker OR knowledge mobilisation OR knowledge mobilization OR research uptake OR research use OR use of research OR evidence informed OR evidence-informed OR decision making OR decision-making OR research utilisation OR research utilization OR technology transfer OR knowledge-to-action OR knowledge to action OR technology transfer OR evidence-informed OR knowledge mobilization) AND (disaster OR “humanitarian crisis”)

Embase (OVID)

(((Information dissemination or diffusion of innovation or knowledge generation or knowledge translation or knowledge transfer or knowledge uptake or knowledge exchange or knowledge broker” or knowledge mobilization or knowledge mobilisation or decision mak” or decision-mak” or evidence-based decision or evidence-policy gap).kw,tw.) OR ((research adj3 “use”).kw,tw.) OR ((research uptake or evidence informed or evidence informed or research utilization or research utilisation or implementation science).kw,tw.) OR ((knowledge adj2 ac- tion).kw,tw.) OR ((exp health care policy) OR (policy or policies or policy-mak” or policy mak” or policy mak” or health polic”).kw,tw.) AND ((exp coronavirinae/ OR (exp coronavirus infection/ OR (exp epidemic/ OR (exp pandemic/ OR (coronavirus* OR 2019-nCoV or 2019 ncov or nCov or Covid-19 or Covid19 or SARSCoV- 2 or novel coronavirus or novel corona virus or covid” OR pneumonia or severe acute respiratory syndrome or coronavirus 2 or coronavirus infection” OR coronavirus disease or corona virus disease or new coronavirus or new corona virus or new coronaviruses or novel coronaviruses or sars or sars corona virus or respiratory infectious disease’ or acute respiratory disease’ or middle-east respiratory syndrome or MERS or pandemic” or swine flu or ebola or H1N1).kw,tw.) OR ((exp emergency/ OR (exp war/ OR “humanitarian emergenc” or emergency response” or emergency relief or health emergency or emergencies or disaster” or humanitarian crisis or crisis response” or tsunami” or earthquake” or flood” or avalanche” or landslide” OR cyclone” OR hurricane” or typhoon” or volcanic eruption” OR drought” OR famine” or radioactive or war or armed conflict”).kw,tw.) AND ((exp systematic review or meta-analysis).kw,tw.) OR (exp “systematic review”).kw,tw.) AND (exp “systematic review”).kw,tw.) OR (exp meta analysis/).kw,tw.))

SPECIFIC COVID-19 DATABASES

LitCovid: ((evidence-informed AND policy) OR (“Knowledge Translation”) OR (KT) OR (“knowledge mobilization”)) AND systematic review

WHO COVID library: (“Knowledge Translation”) OR (KT) OR (“knowledge mobilization”) AND systematic review

Results

538

7

534

850

75
Search strategies

<table>
<thead>
<tr>
<th>GREY LITERATURE</th>
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<tbody>
<tr>
<td><strong>Google and Google Scholar:</strong> ((information dissemination OR knowledge translation OR research use OR research uptake) OR (evidence-informed AND policy)) AND (~emergencies OR disaster OR ~pandemic OR coronavirus OR ~COVID) AND systematic review</td>
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<tr>
<td><strong>Results</strong></td>
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<tr>
<td>33</td>
</tr>
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</table>

**Fig. 1. Prisma flow diagram**

Database searches
(n = 2383)

Grey literature searches
(Google Scholar)
(n = 33)

Records after duplicate removal
(n = 1932)

Records screened
(n = 1932)

Records excluded
(n = 1890)

Full-text articles assessed for eligibility
(n = 42)

• Full-text articles excluded, with reasons (n = 26)
  • Not focused on knowledge transfer (n = 10)
  • Not focused on emergencies (n = 6)
  • Not a systematic review (n = 6)
  • Included in another review (n = 3)
  • Not focused on policy-makers (n = 1)

Studies included in the qualitative synthesis
(n = 16)
Annex 2. Included studies

The 15 included systematic reviews are listed below.


## Annex 3. Studies excluded from full-text analysis

Twenty-six studies were excluded from the full-text analysis for the reasons given.

<table>
<thead>
<tr>
<th>Reference</th>
<th>Reason</th>
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<tbody>
<tr>
<td>Bradley DT, McFarland M, Clarke M (2014). The effectiveness of disaster risk communication: a systematic review of intervention studies. PLOS Curr. 6.e currents.dis.349062e0db1048bb9fc33fa67d8a4f8. doi: 10.1371/currents.dis.349062e0db1048bb9fc33fa67d8a4f8</td>
<td>Not focused on knowledge transfer strategies</td>
</tr>
</tbody>
</table>
Table of references:

<table>
<thead>
<tr>
<th>Reference</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moore G, Redman S, Haines M, Todd A (2011). What works to increase the use of research in population health policy and programmes: a review. Evid Policy. 7(3):277–305. doi: <a href="https://doi.org/10.1332/174426411X579199">https://doi.org/10.1332/174426411X579199</a></td>
<td>Not focused on emergencies or disasters</td>
</tr>
<tr>
<td>Reference</td>
<td>Reason</td>
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</table>
Annex 4. Methodological quality of included studies

### Table A4.1 Included systematic reviews

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<th>Reference</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q5</th>
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<th>Q7</th>
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<th>Q9</th>
<th>Q10</th>
<th>Q13</th>
<th>Q16</th>
<th>Score</th>
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<tr>
<td>Challen et al., 2012 (19)</td>
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<td>✓</td>
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<tr>
<td>Cheatley et al., 2020 (20)</td>
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<td>✓</td>
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<td>Clar et al., 2011 (21)</td>
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<td>✓</td>
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<tr>
<td>Dodd et al., 2019 (22)</td>
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<td>Jha et al., 2018 (23)</td>
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<tr>
<td>Khalid et al., 2020 (16)</td>
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<tr>
<td>Khan et al., 2015 (24)</td>
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</tr>
</tbody>
</table>

Notes: questions from AMSTAR 2 (34–35). Questions Q11, Q12, Q14 and Q15 were not applied to any study. Critically low (CL): more than one critical flaw with or without non-critical weaknesses – the review has more than one critical flaw and should not be relied on to provide an accurate and comprehensive summary of the available studies; high (H): zero or one non-critical weakness – the systematic review provides an accurate and comprehensive summary of the results of the available studies that address the question of interest.
Questions: (Q1) Did the research questions and inclusion criteria for the review include the components of PICO (patient/population, intervention, comparison and outcomes)? (Q2) Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol? (Q3) Did the review authors explain their selection of the study designs for inclusion in the review? (Q4) Did the review authors use a comprehensive literature search strategy? (Q5) Did the review authors perform study selection in duplicate? (Q6) Did the review authors perform data extraction in duplicate? (Q7) Did the review authors provide a list of excluded studies and justify the exclusions? (Q8) Did the review authors describe the included studies in adequate detail? (Q9) Did the review authors use a satisfactory technique for assessing the risk of bias (RoB) in individual studies that were included in the review? (Q10) Did the review authors report on the sources of funding for the studies included in the review? (Q11) If meta-analysis was performed, did the review authors use appropriate methods for statistical combination of results? (Q12) If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis? (Q13) Did the review authors account for RoB in primary studies when interpreting/discussing the results of the review? (Q14) Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review? (Q15) If they performed quantitative synthesis, did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review? (Q16) Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?

NB: references are given in the main reference list.
### Annex 5. Summary of findings

#### Table A5.1 Summary of findings from systematic reviews

<table>
<thead>
<tr>
<th>Reference</th>
<th>Focus</th>
<th>Year of last search</th>
<th>AMSTAR 2 rating</th>
<th>Number and type of included studies</th>
<th>Population/setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blanchet et al., 2017 (18)</td>
<td>Examination of the quantity and quality of evidence on public health interventions in humanitarian crises</td>
<td>2014</td>
<td>CL</td>
<td>345 studies (60 RCTs, 49 non-RCT and 236 observational studies)</td>
<td>Not reported</td>
</tr>
<tr>
<td>Challen et al., 2012 (19)</td>
<td>The availability and use of evidence by emergency planners</td>
<td>2010</td>
<td>CL</td>
<td>1545 studies</td>
<td>Not reported</td>
</tr>
<tr>
<td>Cheatley et al., 2020 (20)</td>
<td>The effectiveness of key nonpharmaceutical interventions used by countries to combat the COVID-19 pandemic (including public information campaigns)</td>
<td>2020</td>
<td>CL</td>
<td>Not detailed</td>
<td>Not reported</td>
</tr>
<tr>
<td>Clar et al., 2011 (21)</td>
<td>The effects of interventions to improve the uptake of research evidence into health policies in low- and middle-income countries</td>
<td>2010</td>
<td>CL</td>
<td>44 studies (21 interventions, 23 non-intervention studies) Only 1 RCT</td>
<td>Multiple settings</td>
</tr>
</tbody>
</table>

- **Reference**: Blanchet et al., 2017 (18), Challen et al., 2012 (19), Cheatley et al., 2020 (20), Clar et al., 2011 (21)
- **Focus**: Examination of the quantity and quality of evidence, The availability and use of evidence, The effectiveness of key nonpharmaceutical interventions, The effects of interventions to improve the uptake of research evidence into health policies
- **Year of last search**: 2014, 2010, 2020, 2010
- **AMSTAR 2 rating**: CL
- **Number and type of included studies**: 345 studies (60 RCTs, 49 non-RCT and 236 observational studies), 1545 studies, Not detailed, 44 studies (21 interventions, 23 non-intervention studies) Only 1 RCT
- **Population/setting**: Not reported, Not reported, Not reported, Multiple settings (the health emergencies setting was a case study of cholera outbreaks that included researchers, policy-makers and primary health-care staff)
<table>
<thead>
<tr>
<th>Key findings</th>
<th>Potential barriers</th>
<th>Countries/regions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence is limited in both quantity and quality. Most studies showed changes in health outcomes but could not attribute these to the intervention because of the study design. Where possible, experimental and quasi-experimental study designs should be used to improve the quality of health research in humanitarian crises.</td>
<td>Low quality of the available evidence</td>
<td>Not available</td>
</tr>
<tr>
<td>Most studies were on emergency planning and response; very few focused on hazard analysis, mitigation or capability assessment.</td>
<td>The validity and generalizability of study findings were unclear</td>
<td>Canada, Japan, United Kingdom, USA, countries in Australasia and Europe (not United Kingdom), plus other high-income countries; some low- and middle-income countries</td>
</tr>
<tr>
<td>Nonpharmaceutical interventions that reduced social interactions were effective. Limited evidence was found on the effectiveness of public information campaigns.</td>
<td>The effectiveness of interventions differed according to the compliance level and disease characteristics.</td>
<td>Not available</td>
</tr>
<tr>
<td>Factors that increased the uptake of research findings into policy were successful collaboration among stakeholders (e.g. policy-makers, researchers, civil society organizations); conducting local research to ensure that evidence-informed recommendations are relevant to the context; good leadership, with government support and commitment; relevant skills training for health professionals; community participation; involving multilateral organizations; specific funding mechanisms and an accessible database of research evidence.</td>
<td>Barriers included a lack of resources; problems with stakeholder engagement (including communication problems); staff turnover (especially of policy-makers); inadequate dissemination strategies; lack of local data; and the topic not being a high priority for policy-makers</td>
<td>Low-income countries (Africa: Ghana, Kenya, Uganda, United Republic of Tanzania, Zambia, group of west African countries; Asia: Bangladesh, Cambodia, Nepal, Viet Nam). Middle-income countries (Africa: Nigeria, South Africa, Asia: China, Iran (Islamic Republic of), Philippines, Latin America: Brazil, Guatemala, Mexico).</td>
</tr>
</tbody>
</table>
Table A5.1 contd

<table>
<thead>
<tr>
<th>Reference</th>
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<th>Year of last search</th>
<th>AMSTAR 2 rating</th>
<th>Number and type of included studies</th>
<th>Population/setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dodd et al., 2019 (22)</td>
<td>Critical factors to promote the integration of scientific evidence into health policy-making</td>
<td>2017</td>
<td>CL</td>
<td>24 studies identified (16 qualitative and 8 mixed methods)</td>
<td>Health policy issues; population not reported</td>
</tr>
<tr>
<td>Jha et al., 2018 (23)</td>
<td>Development of the WHO emergency risk communication guidelines</td>
<td>2016</td>
<td>CL</td>
<td>21 studies on best practices; 24 studies on information sharing and coordination mechanisms</td>
<td>Not reported</td>
</tr>
<tr>
<td>Khalid et al., 2020 (16)</td>
<td>Identifying facilitators and barriers to evidence-informed decision-making in crisis zones in low- and middle-income countries</td>
<td>2017</td>
<td>CL</td>
<td>27 studies</td>
<td>16 studies on natural hazards (e.g. tsunami, hurricane, flu pandemic), 5 on human-induced hazards (e.g. armed conflict, refugee crisis) and 6 on both</td>
</tr>
<tr>
<td>Key findings</td>
<td>Potential barriers</td>
<td>Countries/regions</td>
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<td>Research evidence was more likely to inform policy-making when it was disseminated via a cohesive policy network. Public opinion strongly influenced policy decisions, particularly during infectious disease outbreaks. Policy briefs are a useful method of succinctly describing policy problems and their solutions and the cost-effectiveness of a policy</td>
<td>Lack of access to credible local data was identified as a barrier for knowledge translation platforms in influencing policy</td>
<td>Bangladesh</td>
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<tr>
<td>Key elements to enhance information sharing and coordination across organizations included the creation of networks, taskforces and committees across disciplines, organizations and geographical areas. Engagement of local stakeholders was also important to guarantee that information is shared vertically within the chain of command</td>
<td>Emergency risk communication functions can be integrated into the response to a public health emergency by reforming the leadership structure, modifying organizational factors and nullifying restrictions (including amending laws/regulations) that might prevent the timely release of information</td>
<td>China, Hong Kong SAR, Taiwan (China), United Kingdom</td>
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</table>
| The study described a new conceptual framework, comprising 4 systems: politics, health system, humanitarian aid and health research. In the response to a humanitarian crisis, the challenge is to persuade decision-makers to consider research evidence alongside their professional judgement in the decision-making process. Within the political system, policy dialogues provide a means for research evidence to supplement the knowledge and experiences of front-line staff. Within the humanitarian aid system, rapid evidence summaries provide a synopsis of evidence that can be quickly and easily understood by nontechnical decision-makers. Where specific research evidence on crisis areas is unavailable, rapid operational research is required | Barriers identified in the 4-system framework were:  
• **politics**: different actors lobbying government about their preferred management approaches based on organizational interests, actors relying solely on their own professional opinion  
• **health system**: failure to engage with actors in a network approach hindering the collection and sharing of evidence  
• **humanitarian aid**: inadequate access to the available evidence, inadequate communication strategies for sharing evidence  
• **health research**: earmarked funds to conduct and share evidence, lack of policy authority to ensure conflicts of interest are declared in the available evidence, failure of existing evidence to meet the needs of decision-makers | Democratic Republic of the Congo, China, Grenada, Haiti, India, Nepal, Pakistan, Peru, South Africa, Uganda, Zimbabwe, South-east Asia, East Africa; other low- and middle-income countries |
<table>
<thead>
<tr>
<th>Reference</th>
<th>Focus</th>
<th>Year of last search</th>
<th>AMSTAR 2 rating</th>
<th>Number and type of included studies</th>
<th>Population/setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Khan et al., 2015 (24)</td>
<td>Mapping the evidence on emergency planning and understanding knowledge gaps relevant to research use</td>
<td>2013</td>
<td>CL</td>
<td>58 studies</td>
<td>Public health (local, province/state or national level)</td>
</tr>
<tr>
<td>Masood et al., 2020 (26)</td>
<td>The amount of research evidence used in public health policy-making and processes for using evidence in decision-making process</td>
<td>2010</td>
<td>CL</td>
<td>16 studies (1 on the 2009 influenza A(H1N1) pandemic)</td>
<td>Countries with universal health coverage</td>
</tr>
<tr>
<td>McDonald et al., 2016 (25)</td>
<td>Social, geographical and cultural contexts of knowledge transfer in Inuit communities</td>
<td>2015</td>
<td>CL</td>
<td>17 studies</td>
<td>Inuit population and decision-makers</td>
</tr>
<tr>
<td>Key findings</td>
<td>Potential barriers</td>
<td>Countries/regions</td>
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<tr>
<td>The evidence was grouped into 12 themes: attitudes and beliefs; capacity assessment and building; collaboration and system integration; communicable disease control; communication; education, training and exercises; ethical considerations; planning; psychosocial impacts of emergencies; public health considerations for sheltering and evacuation; quality improvement and performance standards; and surveillance, epidemiology and public health information</td>
<td>Several key knowledge gaps were identified in the following themes: attitudes and beliefs; collaboration and system integration; communication; quality improvement and performance standards; and resilience. Resilience emerged as both a gap and a cross-cutting theme. Additional cross-cutting themes included equity, gender considerations, and high-risk or at-risk populations</td>
<td>Not available</td>
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<td>Informal evidence is used most often in public health policy-making, but the use of research findings is increasing. Research findings tend to be used indirectly to improve knowledge and change the attitudes of policy-makers. Organizational support such as training programmes and guidelines can promote evidence-informed policy-making.</td>
<td>Barriers for individuals: resistance to change, time constraints, leadership style/beliefs and lack of skills/expertise. Barriers for organizations are lack of the following: professional development opportunities/capacity-building at local level (including training programmes), facilitators, technical infrastructure to access research, organizational tools to evaluate research, guidelines on the use of research and internal prompts to use research; another barrier may be the type of organization itself. In a pandemic, the use of research in decision-making may be hindered by pre-existing beliefs about epidemiological factors; competing interests of stakeholders and institutional factors.</td>
<td>Australia, Canada, New Zealand, Norway, United Kingdom, USA</td>
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<td>Three themes were identified: the value of community involvement in the research process; the importance of tailoring knowledge transfer strategies and messaging to the local context; and issues of variable and contradictory health messaging.</td>
<td>Lack of a critical assessment of community involvement in research; gaps in the literature on assessments of knowledge transfer; assessments rarely addressed whether the intended purpose of knowledge transfer had been achieved.</td>
<td>Canada, Greenland (Denmark), Russian Federation</td>
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<tr>
<td>Reference</td>
<td>Focus</td>
<td>Year of last search</td>
<td>AMSTAR 2 rating</td>
<td>Number and type of included studies</td>
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<td>Morton et al., 2015 (27)</td>
<td>Mapping the evidence on disaster surge management</td>
<td>2015</td>
<td>CL</td>
<td>61 studies (50 quantitative and 11 concept papers)</td>
<td>Not reported</td>
</tr>
<tr>
<td>Potter et al., 2010 (28)</td>
<td>The usefulness of past organizational experiences to guide education/training for public health workers in the emergency/disaster response</td>
<td>2007</td>
<td>CL</td>
<td>163 studies</td>
<td>Health-care workers</td>
</tr>
<tr>
<td>Quinn et al., 2014 (29)</td>
<td>Nature of knowledge exchange portals and their contribution to knowledge management in public health</td>
<td>2013</td>
<td>CL</td>
<td>15 studies (8 case studies, 6 evaluation studies, 1 commentary)</td>
<td>Policy-makers or evidence-informed decision-makers in public health</td>
</tr>
<tr>
<td>Salajan et al., 2020 (30)</td>
<td>Decision-making processes at different levels during infectious disease outbreaks</td>
<td>2018</td>
<td>CL</td>
<td>49; 37 peer-reviewed articles (34 qualitative, 2 mixed methods, 1 quantitative) and 12 evaluation reports</td>
<td>Infectious disease outbreaks (Ebola, Escherichia coli, influenza A(H1N1)pdm09, SARS and Schmallenberg virus)</td>
</tr>
<tr>
<td>Smith et al., 2018 (31)</td>
<td>Evidence mapping on disaster management</td>
<td>2017</td>
<td>CL</td>
<td>9433 studies</td>
<td>Not reported</td>
</tr>
</tbody>
</table>

CL: critically low; EEA: European Economic Area; EU: European Union; H: high; H1N1: influenza A(H1N1)pdm09; KT: knowledge translation; RCT: randomized controlled trial; SAR: Special Administrative Region; SARS: severe acute respiratory syndrome.

NB: references are given in the main reference list.
<table>
<thead>
<tr>
<th>Key findings</th>
<th>Potential barriers</th>
<th>Countries/regions</th>
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</thead>
<tbody>
<tr>
<td>The studies were on the criteria and methods for allocating scarce resources, effective triage methods, key decision-makers for planning and responding to disaster surges, the needs of the workforce and developing communication and information-sharing strategies. Not reported</td>
<td>Not reported</td>
<td>Not available</td>
</tr>
<tr>
<td>A thematic analysis identified the main topics of the studies as organizational systems, leadership and command structure, and information and communication. The usefulness of evidence to trainers and educators was rated as fair–good.</td>
<td>Poor interaction between trainers, policy-makers and public health agencies hindered the development of effective training programmes.</td>
<td>Not reported</td>
</tr>
<tr>
<td>Most knowledge exchange portals included features to support access to knowledge and the creation of new content, but studies to evaluate user needs would be useful. Website usage statistics showed the increasing use of some portals over time, but difficulties in retaining users were reported. Data suggested that use of a knowledge exchange portal combined with targeted messaging can increase the use of evidence into decision-making for public health policy and programmes.</td>
<td>Lack of performance evaluation is a barrier to the effective use of portals in evidence-informed decision-making in public health.</td>
<td>Canada, Europe, USA</td>
</tr>
<tr>
<td>The most important strategies for evidence-informed decision-making are to build capacity, skills and relationships among key actors in the outbreak response, and to promote transparency in decision-making. Different approaches and strategies were used to achieve these goals.</td>
<td>Barriers to evidence-informed decision-making in disease outbreaks were national/international institutional and legal structures that hampered coordination and collaboration. Complex organizational structures can inhibit information sharing and delay the response to outbreaks.</td>
<td>Australia, Canada, USA, EEA countries, EU Member States, EU pre-accession countries</td>
</tr>
<tr>
<td>Evidence was obtained from descriptive, quantitative and qualitative methodologies and high-level evidence sources. Assessments suggested that users want easily accessible, summarized information and collaborative mechanisms for knowledge exchange.</td>
<td>Most studies were of low quality.</td>
<td>Not reported</td>
</tr>
</tbody>
</table>
Annex 6. Glossary of methodological terms

**Effectiveness**
The extent to which a specific intervention, when used under ordinary circumstances, does what it is intended to do. Clinical trials that assess effectiveness are sometimes called pragmatic or management trials.

**Grey literature**
Grey literature is the kind of material that is not published in easily accessible journals or databases. It includes things such as conference proceedings that include abstracts of the research presented at conferences, and unpublished theses.

**Knowledge broker**
This is often a senior, well-connected and respected individual or an organization whose core function is to connect people to exchange knowledge. A broker brings stakeholders together, builds relationships, cements coalitions and alliances, and helps to build new skills and capacities. Also called knowledge facilitators.

**Observational study**
A study in which the investigators do not seek to intervene and simply observe the course of events. Changes or differences in one characteristic (e.g. whether or not people received the intervention of interest) are studied in relation to changes or differences in other characteristic(s) (e.g. whether or not they died), without action by the investigator. There is a greater risk of selection bias than in experimental studies.

**Policy dialogue**
Deliberations among policy-makers, researchers and stakeholders that integrate explicit knowledge and tacit knowledge to guide policy development. Also called stakeholder dialogues.

**Primary study**
Original research in which data are collected. The term primary study is sometimes used to distinguish it from a secondary study (re-analysis of previously collected data), meta-analysis or other ways of combining studies (such as economic analysis and decision analysis).

**Randomized controlled trial**
An experiment in which two or more interventions, possibly including a control intervention or no intervention, are compared by being randomly allocated to participants. In most trials, one intervention is assigned to each individual but sometimes assignment is to defined groups of individuals (e.g. in a household) or interventions are assigned within individuals (e.g. in different orders or to different parts of the body).
Systematic review (synonym: systematic overview)
A review of a clearly formulated question that uses systematic and explicit methods to identify, select and critically appraise relevant research, and to collect and analyse data from the studies that are included in the review. Statistical methods (meta-analysis) may or may not be used to analyse and summarize the results of the included studies.
Knowledge translation is “the synthesis, exchange, and application of knowledge by relevant stakeholders to accelerate the benefits of global and local innovation in strengthening health systems and improving people’s health.”

World Health Organization 2006

Rapid response Knowledge translation mechanisms to translate evidence into public health policy in emergencies

The WHO Regional Office for Europe

The World Health Organization (WHO) is a specialized agency of the United Nations created in 1948 with the primary responsibility for international health matters and public health. The WHO Regional Office for Europe is one of six regional offices throughout the world, each with its own programme geared to the particular health conditions of the countries it serves.

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Armenia  Malta
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Azerbaijan  Montenegro
Belarus  Netherlands
Belgium  North Macedonia
Bosnia and Herzegovina  Norway
Bulgaria  Poland
Croatia  Portugal
Cyprus  Republic of Moldova
Czechia  Romania
Denmark  Russian Federation
Estonia  San Marino
Finland  Serbia
France  Slovakia
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Germany  Spain
Greece  Sweden
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Iceland  Tajikistan
Ireland  Turkey
Israel  Turkmenistan
Italy  Ukraine
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World Health Organization
Regional Office for Europe
UN City, Marmorvej 51, DK-2100 Copenhagen Ø, Denmark
Tel.: +45 45 33 70 00
Fax: +45 45 33 70 01
Email: eurocontact@who.int
Website: www.euro.who.int