LEADERSHIP AND GOVERNANCE

Question 1: How can emergency risk communication best be integrated into national and international public health emergency preparedness planning and response activities?

Problem: (phenomenon of interest) Integration of ERC functions into national government leadership for response to emergency events with public health implications

Setting :Preparation for and response to national and international events/emergencies in high, middle, low income and fragile states

Perspective : National governments

Comparison (Foci to explore and compare): Placement of ERC functions in national leadership structure/ organizational proximity of ERC practitioners to national health response leadership, distribution of ERC practitioners across national leadership sectors

Evaluation: **(What happened/ what worked/consequences/impact / how effective?):** Public trust in information, reach of information, coordination of information sharing, ability of practitioners to influence decisions; timeliness of information

Systematic Review Findings:

The six articles identified for Q1 present examples of mechanisms that might lead to the integration of emergency risk communication (ERC) functions in the leadership structure, such mechanisms can be summarized under three themes/outcomes:

1) Placing ERC functions into the national leadership structure:

2) Creating organizational proximity of ERC practitioners to national response leadership

3) Development of Laws, Regulations, policies and frameworks in support of ERC

A cross-cutting theme, in addition to the three cited above, was 4) the use of training and exercises as a mechanism for testing the effectiveness of the system.

Refer to synthesized findings tables (in executive summary) for detailed findings and evidence assessment

Evidence from Non-English Studies

Synthesis of findings in Chinese language literature (see table 14, Question 1 systematic review report) . Many reports deal with use of Weibo (twitter) by Chinese emergency response leadership emergency risk communications. Others examine need for more training, establishment of professional roles (eg media monitoring and spokesperson) and enabling of timely release of relevant information on disease outbreaks and prevention.

Additional Grey Literature Review Findings:

Five documents were identified as potentially relevant to this question. Of these, three were assessed as being high credibility sources and two as moderate credibility. Although identified as possibly relevant, none of these documents provided evidence regarding intervention or action outcomes, nor did they specifically address risk communication per se.

The closest a document came to listing results was the statement that countries like Uganda have demonstrated that building a public health system capable of responding to and containing an outbreak of infectious disease is possible; it requires leadership. Critical to such a system is community engagement, as well as their awareness, trust and cooperation (1). This implies risk communication.

In BBC Media Action's policy briefing, Caroline Sugg noted that despite acknowledgement of the important role it plays in health, communication too often remains an underfunded afterthought. She stated that social and behavioural change communication should be included as an integral part of health programs and that an "institutional home" should be created for health communication (2).

The United Nations General Assembly stated that International Health Regulation (IHR) compliance includes establishing preparedness and response mechanisms. Community engagement and culturally appropriate communication form an integral part of such mechanisms (3). This also implies integration or risk communication into national health plans.

Additionally, in its Ebola Response Improvement Plan, the United States Department of Health and Human Services noted the importance of prioritizing risk communication. A department-wide emergency risk communication strategy was to be developed, including training staff to serve as spokespersons and planning to ensure an adequate supply of such trained personnel.

These findings indicate that action does not yet meet intention. Political will needs to be engaged to ensure appropriate prioritizing of risk communication as an integral part of public health.

Potential recommendations from findings:

- **Emergency risk communications should be a designated role in global and national emergency preparedness and response leadership teams**
- **Emergency risk communications professionals need legislative and policy support including authority to release information**
- **(Training and preparedness exercises can be used to increase understanding of the need for the emergency risk communications role in the emergency preparedness and response leadership…justification for recommendation question 3)**

Assessment

	JUDGEMENT	RESEARCH & GREY EVIDENCE	ASSESSMENT OF CONFIDENCE IN THE EVIDENCE
PROBLEM	**Is the problem a priority?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies ○ Don't know	Review findings: **Grey literature findings** indicate that action does not yet meet intention. Political will needs to be engaged to ensure appropriate prioritizing of risk communication as an integral part of public health.	
DESIRABLE RESPONSES,&IMPACTS & EFFECTS	What happened that was desirable? What seemed to work? What were the desirable wider impacts and consequences? What had a measurable desirable effect? In what contexts and with whom? How important are the desirable anticipated responses/impacts/effects? ○ Not important ○ Somewhat Important ○ Important ○ Very important ○ Varies	Systematic Review **Integration of ERC into leadership during reform**: ERC was integrated in national public health emergency planning and response activities when Taipei initiated a new public health plan in following the SARS outbreak SARS Creation of preparedness committees and preparedness frameworks within each country political context integrated ERC functions in national leadership structures Enacting responsive multi-level communication mechanisms increased proximity to leadership Creation of agreements between countries for better integration of ERC in cross-country planning Use of exercises to test ERC functions across countries better integrates ERC	Moderate (CERQual adapted) Moderate (CERQual adapted) Moderate (CERQual

	○ Don't know	functions **Chinese language synthesized finding:** Use of Chinese Government Weibo (twitter) as emergency response mechanism (see table 14 of question 1 report) **What did not work?** Legal and policy restrictions on release of information	adapted) Low (CERQual adapted) Moderate (CERQual adapted)
UNDESIRABLE RESPONSES, IMPACTS & EFFECTS	What happened that was undesirable? What did not seem to work? What were the undesirable wider impacts and consequences? What had a measurable undesirable effect? In what contexts and with whom? How important are the undesirable anticipated responses/impacts/effects? ○ Not important ○ Somewhat Important ○ Important ○ Very important ○ Varies ○ Don't know		Moderate (CERQual adapted)
VALUES	Is there important uncertainty about or variability in how key stakeholders or people value and respond to the phenomena of interest/outcome? In what contexts and with whom? ○ Important uncertainty or variability ○ Possibly important uncertainty or variability ○ Probably no important uncertainty or variability ○ No important uncertainty or variability ○ Varies ○ Don't know		

RESOURCES REQUIRED	**How large are the resource requirements for the proposed option(s) (costs)?** ○ Large costs ○ Moderate costs ○ Negligible costs and savings ○ Moderate savings ○ Large savings ○ Varies ○ Don't know ○ Not applicable		
CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES	**What is the certainty of the evidence of resource requirements for the proposed option(s) (costs)?** ○ Very low ○ Low ○ Moderate ○ High ○ No included studies ○ Not applicable		
EQUITY	**Does the evidence underpinning the option(s) consider health equity issues or particular contexts or subgroups?** ○ No ○ Yes ○ Varies ○ Don't know		

ACCEPTABILITY	**Is the option(s) acceptable to key stakeholders?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies ○ Don't know		
FEASIBILITY	**Is the option(s) feasible to implement?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies ○ Don't know		

Potential recommendations from findings:

- **Emergency risk communications should be a designated role in global and national emergency preparedness and response leadership teams**
- **Emergency risk communications professionals need legislative and policy support including authority to release information**
- **(Training and preparedness exercises can be used to increase understanding of the need for the emergency risk communications role in the emergency preparedness and response leadership…justification for recommendation question 3)**

Summary of judgements

	JUDGEMENT								IMPLICATIONS
PRIORITY PROBLEM	No	Probably no	Probably yes	Yes		Varies	Don't know		
HOW IMPORTANT ARE THE DESIRABLE RESPONSES, IMPACTS & EFFECTS?	Not important	Somewhat important	Important	Very Important		Varies	Don't know		
HOW IMPORTANT ARE THE UNDESIRABLE RESPONSES, IMPACTS & EFFECTS?	Not important	Somewhat important	Important	Very Important		Varies	Don't know		
CERTAINTY/CONFIDENCE OF EVIDENCE BY EVIDENCE TYPE **ADD SEPARATE RATINGS FOR:** **GRADE** **ADAPTED GRADE** **CERQUAL** **ADAPTED CERQUAL**	 Very Low Very Low Very Low Very Low	 Low Low Low Low	 Moderate Moderate Moderate Moderate	 High High High High			 No included studies No included studies No included studies No included studies		
VALUES	Important uncertainty or variability	Possibly important uncertainty or variability	Probably no important uncertainty or variability	No important uncertainty or variability		Varies	Don't know		

	JUDGEMENT								IMPLICATIONS
RESOURCES REQUIRED	Large costs	Moderate costs	Negligible costs and savings	Moderate savings	Large savings	Varies	Don't know	N/A	
CERTAINTY OF EVIDENCE FOR REQUIRED RESOURCES	Very low	Low	Moderate	High			No included studies	N/A	
COST EFFECTIVENESS	Favours the comparison	Probably favours the comparison	Does not favour either the intervention or the comparison	Probably favours the intervention	Favours the intervention	Varies	No included studies	N/A	
DOES THE EVIDENCE CONSIDER EQUITY ISSUES?	No			Yes		Varies	Don't know		
ACCEPTABILITY OF THE OPTION(S)	No	Probably no	Probably yes	Yes		Varies	Don't know		
FEASIBILITY OF THE OPTION(S)	No	Probably no	Probably yes	Yes		Varies	Don't know		

Conclusions

Possible recommendations:

- **Emergency risk communications as designated role in global and national emergency preparedness and response leadership teams**
- **Legislative and policy support including authority to release information**
- **Training and preparedness exercises to increase understanding of the need for the emergency risk communications role in the emergency preparedness and response leadership**

TYPE OF RECOMMENDATION	We recommend against the option(s) ○	We suggest considering the option(s): ○ Only in the context of rigorous evaluation ○ Only in specific contexts	We recommend the option(s) ○
RECOMMENDATION			
JUSTIFICATION			
SUBGROUP/EQUITY CONSIDERATIONS			
IMPLEMENTATION CONSIDERATIONS			
MONITORING AND EVALUATION			
RESEARCH PRIORITIES			

INFORMATION SYSTEMS & COORDINATION

Question 2: What are the best mechanisms to establish effective intra-agency, inter-agency, and/or cross-jurisdictional information sharing?

Question 6: What are the best practices and protocols to ensure coordination of risk communication activities between responding agencies across organizations and levels of response?

Problem (phenomenon of interest): Identification of mechanisms ensuring coordination of information and risk communication activities between responding entities in emergencies **Setting** : Preparing and responding to national/international emergencies/ events, in low, middle, high income and fragile states **Perspective** : National governments and relevant and subnational authorities, responding and implementing partners **Comparison (Foci to explore and compare):** Networks, standard operating procedures, joint planning, organizational structures, joint information centres, collaborative leadership, team building **Evaluation (What happened/ what worked/consequences/impact / how effective?)**: Speed and coverage of public information, consistency of shared information and messaging, public trust, leveraged human and financial resources **Time scope:** 2003 onward	**ADDITIONAL INFORMATION** Substantial overlap in themes and articles retrieved for the 2 questions led to presentation of the evidence synthesis and findings together.

Systematic Review Findings:

Three themes emerged from the literature as mechanisms to enhance information sharing and coordination:

The creation of task forces and committees with key stakeholders has been described as a mechanism for improving or facilitating information sharing between national and sub-national authorities and between agencies. A number of components for the effective operation of networks, taskforces, and committees were identified. These include: the importance of existing relationships between responders prior to an incident (Nowell 2015), the role of network teams, as opposed to hierarchical teams, for improved emergency response performance and decision making (Schraagen 2010), and the importance of information exchange and distribution between decision-making units (Bharosa 2010). They also include the use of Information Managers (IM) for coordinating information between agencies, so as to reduce information demand and improve the supply of key information (Bharosa 2009), the importance of a Public Information Officer (PIO) for improved information dissemination (Howard 2012).

Existing platforms and information system can be leveraged to enhance ERC. Gresham et al (2009) presented an example of using regional disease surveillance networks as a useful mechanism for information sharing. The Middle East Consortium on Infectious Disease Surveillance (MECIDS), a regional disease surveillance network of public health experts and ministry of health officials from Israel, the Palestinian Authority, and Jordan. MECIDS unites public health officials of differing Middle Eastern nationalities and contributes to regional health and stability by engaging in regular cross-border information exchange, conducting regular executive board meetings, performing laboratory and risk communications training, and implementing innovative communication technology. Initially focused on food- and waterborne diseases, the partnership developed a network of laboratories, protocols for specimen collection and diagnosis of diarrheal diseases, and data sharing and notification capabilities, so as to analyze and share information on disease threats.

Bharosa presented another example: funded by the European Union, the FLIWAS was developed to optimize communication between water-management and crisis-management agencies across the border, and comprises of "generic components" like communication with various databases, plan modules and web mapping. Leonard described the advantages of having an established system for cross-discipline (i.e. scientists, emergency managers, health and infrastructure agencies, media and the public) information sharing in the context of a 2012 volcanic eruption in New Zealand.

Engagement of local stakeholders is important for the effectiveness of the ERC strategy. Important elements of mechanisms for the engagement of local stakeholders in communication efforts were identified. Cole et al. (2014) describes the importance of using existing social networks in small municipalities for disaster risk reduction activities. Shepherd et al. (2014) addresses the issue of communicating with culturally diverse communities, and the need for centralizing resources that can be used to facilitate communication with these groups. Chang and Wang studied the process of information sharing and coordination within Taiwan's emergency management information system (EMIS) and recommended identification and designation of an agency that has the best geographic and community reach (in this case, the police) to lead the process of ERC sharing. It was also important to address technology gaps in economically backward areas, integrate NGOs into the EMIS, and develop capacity to monitor and utilize the social media channels.

In summary the 3 themes identified are:

1. **Networks and task forces/committees**

2. **Information systems (tools and platforms)**
3. **Mechanisms to facilitate local stakeholders' engagement in risk communications**

Additional Grey Literature Review Findings:

For Question 2:

One model for improving cross-jurisdictional linkages and coordination came from the polio eradication campaign. When eradication efforts stalled, an independent monitoring board of experts drawn from around the world was established. This board used a combination of strong leadership, clear goals against which to measure progress, and frank speech about under-performing programs, as well as a program of cross-border meetings and synchronization to encourage compliance and make great strides in the eradication of this disease.

The second example of cross-jurisdictional linkages and coordination came from WHO and the International Health Regulations (IHR), and is undergoing a significant readjustment. Prior to the West African Ebola outbreak, the question remained open as to whether WHO should be an operational agency in addition to its norm-setting and coordinating capacity. Post-Ebola, various review bodies and the Member States articulated that WHO should become an operational agency, taking the lead in emergency preparedness and response. A new Health Emergencies Program was established to be the nerve centre of global emergency preparedness and response (3, 8, 9). Its implementation is still too new for evaluation. The IHR were found not to be in need of revision, but in need of implementation instead.

Question 6:

Of the 33 documents identified, all but four grew directly out of either the Ebola or Zika responses, and even one of these touched on the Ebola outbreak, although it was not the main focus. One paper reported a disconnect between risk assessors and risk communicators, seeming as if they spoke different languages. Simulation exercises and training of risk communications personnel on the principles of risk assessment were recommended as possible solutions to this challenge (13). Two documents presented the importance of coordinating with the press, before and during an incident, meeting their needs and remaining available to them. This type of coordination was found especially important as many people depend on the media for their health information (18, 52).

The overwhelming majority of sources for this question, 28 documents, dealt with the Ebola outbreak. Three highlighted local collaboration efforts. In Montserrado County, Liberia, OFDA funded the International Rescue Committee (IRC) to lead a consortium of four other non-governmental organizations (NGOs). This proved to be more effective than their efforts working separately, as it allowed organizations to focus and capitalize on their areas of strength. It also allowed them to advocate more effectively with the government. Sharing information between consortium members was vital to effective work and helped build trust, as did getting technical input from WHO (53). Another report also found that a consortium improved coordination. This consortium, the Social Mobilisation Action Consortium (SMAC), worked through local religious and community leaders, social mobilizers and local radio, ensuring coordination not only of interventions, but also of messages (36). Y Care also found that the National Ebola Taskforce and the Pull Slum Pan Pipal Consortium helped improve coordination (41).

Another report focused on the specific nature of needed coordination, noting that, "More attention needs to be paid to the connections, feedback loops and relationships between different individuals and different organisations across the local, district and national levels. Priorities for attention include: data reporting and management;

sustained supportive supervision of health workers; integration of grievance mechanisms and other social accountability tools into public services; and coordination methods that actually facilitate coordination rather than just information sharing" (50).

Where coordination efforts should be based also received attention, as did the importance of clearly defined roles and responsibilities. One report recommended that well-organized coordination systems be based at the district level (54). Another noted the importance of clearly defined roles for all those implicated in a response effort (52).

Fifteen documents focused on WHO and its role in the Ebola response. In this response, WHO served as technical lead, providing training, monitoring and evaluation, as well as leading the overall health response (27). This response was perceived as too slow and inadequate, overly political and not independent. Member States felt that in order to fulfil its mandate, WHO must improve its performance and change these perceptions (9).

Member States expect WHO to play a primary role in responding to outbreaks or other health emergencies, providing leadership, expertise, support, backstopping and coordination (9). A potential tension was identified between the expectation for WHO to lead coordination efforts and the necessity of tailoring risk communication for local populations and circumstances. Primary responsibility for response must rest with national governments, and WHO's role will need to flex, sometimes leading, sometimes "getting out of the way". Focus should be on building local capacity (55). For both WHO and other organizations, leading and coordinating crises was seen as the biggest skills gap (56). A number of recommendations addressed filling this gap.

As global health cluster lead, WHO has been tasked with coordinating partners and their activities before, during and after health emergencies. This includes developing mechanisms for local, as well as global coordination and articulating common risk communication goals, building strong relationships with partners and clarifying roles and responsibilities (14). These coordination efforts should be led through meetings and teleconferences, and establishment of Emergency Response Centres (11). These centres should include risk communications expertise (57). Response capacity needs to be based at the district level, and WHO should to continue to lead district-level coordination, ensuring that each district has a tailored and flexible plan (58).

In addition to these measures, WHO established a standing advisory committee to review its risk assessment and risk communication. It also created an intermediate level of alert via a new category of risk that requires specific follow-up, called an International Public Health Alert (IPHA), and developed an updated communication strategy (10).

These reforms have begun to be implemented (31, 37) and the initial Zika response looks promising (12, 16), but it is still too early to determine the effectiveness of these reforms (59).

Potential options for recommendations/Best practices/ important principles, implementation considerations

Options to enhance information sharing and coordination between stakeholders include:

Leverage existing networks/taskforces/committees across disciplines, organizations and geographic areas

Tailor functional information systems to the needs of users

Engage local stakeholders to guarantee flow of information across sectors

Assessment

	JUDGEMENT	RESEARCH & GREY EVIDENCE	ASSESSMENT OF CERTAINTY/CONFIDENCE IN THE EVIDENCE
PROBLEM	**Is the problem a priority?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies ○ Don't know	Strong grey evidence support (see full findings above)	
DESIRABLE RESPONSES,&IMPACTS & EFFECTS	What happened that was desirable? What seemed to work? What were the desirable wider impacts and consequences? What had a measurable desirable effect? In what contexts and with whom? How important are the desirable anticipated responses/impacts/effects? ○ Not important ○ Somewhat Important ○ Important ○ Very important ○ Varies ○ Don't know	Creation of taskforces/ committees to enhance emergency risk communications was described in 7 studies as a mechanism for improving information sharing between national , subnational authorities and agencies Information systems- tools and platforms improved sharing of information and enhanced ERC (8 studies) Engagement of local stakeholders is important for effective ERC strategies (6 studies) . Important elements of mechanisms for the engagement of local stakeholders in communication efforts were identified. Cole et al. (2014) describes the importance of using existing social networks in small municipalities for disaster risk reduction activities. Shepherd et al. (2014) addresses the issue of communicating with culturally diverse communities, and the need for centralizing resources that can be used to facilitate communication with these groups. Chang and Wang studied the process of information sharing and coordination within Taiwan's emergency management information system (EMIS) and recommended identification and designation of an agency that has the best geographic and community reach (in this case, the police) to lead the process of ERC sharing. It was also important to address technology gaps in economically backward areas, integrate NGOs into the EMIS, and develop capacity to monitor and utilize the social media channels.	Moderate (CERQual adapted) Moderate (CERQual adapted) Moderate (CERQual adapted)

		Grey literature Forming a consortium improved coordination. In Montserrado County, Liberia, OFDA funded the International Rescue Committee (IRC) to lead a consortium of four other non-governmental organizations (NGOs). This proved to be more effective than their efforts working separately, as it allowed organizations to focus and capitalize on their areas of strength. It also allowed them to advocate more effectively with the government. Sharing information between consortium members was vital to effective work and helped build trust, as did getting technical input from WHO (53).	
UNDESIRABLE RESPONSES, IMPACTS & EFFECTS	What happened that was undesirable? What did not seem to work? What were the undesirable wider impacts and consequences? What had a measurable undesirable effect? In what contexts and with whom? How important are the undesirable anticipated responses/impacts/effects? ○ Not important ○ Somewhat Important ○ Important ○ Very important ○ Varies ○ Don't know	What did not work? **Hierarchical teams** did not perform as fast as network teams. In relatively complex environments, network teams arrive at correct decisions more frequently than hierarchical teams.	Moderate (CERQual adapted)
VALUES	Is there important uncertainty about or variability in how key stakeholders or people value and respond to the phenomena of interest/outcome? In what contexts and with whom? ○ Important uncertainty or variability ○ Possibly important uncertainty or variability ○ Probably no important uncertainty or variability ○ No important uncertainty or variability ○ Varies ○ Don't know		

RESOURCES REQUIRED	**How large are the resource requirements for the proposed option(s) (costs)?** ○ Large costs ○ Moderate costs ○ Negligible costs and savings ○ Moderate savings ○ Large savings ○ Varies ○ Don't know ○ Not applicable	Clarke et al (2006) describes how, during the 2001 Anthrax attacks, a university in the US organized an Emergency Operations Committee (EOC) designed to bring together groups such as Police, EHS, Occupational Health, and other departments, to share information, pool resources, and coordinate communication with the university community. **Collaboration involved the pooling of resources,** sharing of information, and integration of communication infrastructure to form a more organized approach to risk communications.	CERQual moderate
CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES	**What is the certainty of the evidence of resource requirements for the proposed option(s) (costs)?** ○ Very low ○ Low ○ Moderate ○ High ○ No included studies ○ Not applicable		
EQUITY	**Does the evidence underpinning the option(s) consider health equity issues or particular contexts or subgroups?** ○ No ○ Yes ○ Varies ○ Don't know		

ACCEPTABILITY	**Is the option(s) acceptable to key stakeholders?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies ○ Don't know		
FEASIBILITY	**Is the option(s) feasible to implement?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies ○ Don't know		

Potential options for recommendations/Best practices/ important principles, implementation considerations

Options to enhance information sharing and coordination between stakeholders include:

Leverage existing networks/taskforces/committees across disciplines, organizations and geographic areas

Tailor functional information systems to the needs of users

Engage local stakeholders to guarantee flow of information across sectors

Summary of judgements

	JUDGEMENT								IMPLICATIONS
PRIORITY PROBLEM	No	Probably no	Probably yes	Yes		Varies	Don't know		
HOW IMPORTANT ARE THE DESIRABLE RESPONSES, IMPACTS & EFFECTS?	Not important	Somewhat important	Important	Very Important		Varies	Don't know		
HOW IMPORTANT ARE THE UNDESIRABLE RESPONSES, IMPACTS & EFFECTS?	Not important	Somewhat important	Important	Very Important		Varies	Don't know		
CERTAINTY/CONFIDENCE OF EVIDENCE BY EVIDENCE TYPE **ADD SEPARATE RATINGS FOR:** **GRADE** **ADAPTED GRADE** **CERQUAL** **ADAPTED CERQUAL**	 Very low Very Low Very Low Very Low	 Low Low Low Low	 Moderate Moderate Moderate Moderate	 High High High High			 No included studies No included studies No included studies No included studies		
VALUES	Important uncertainty or variability	Possibly important uncertainty or variability	Probably no important uncertainty or variability	No important uncertainty or variability		Varies	Don't know		

	JUDGEMENT								IMPLICATIONS
RESOURCES REQUIRED	Large costs	Moderate costs	Negligible costs and savings	Moderate savings	Large savings	Varies	Don't know	N/A	
CERTAINTY OF EVIDENCE FOR REQUIRED RESOURCES	Very low	Low	Moderate	High			No included studies	N/A	
COST EFFECTIVENESS	Favours the comparison	Probably favours the comparison	Does not favour either the intervention or the comparison	Probably favours the intervention	Favours the intervention	Varies	No included studies	N/A	
DOES THE EVIDENCE CONSIDER EQUITY ISSUES?	No			Yes		Varies	Don't know		
ACCEPTABILITY OF THE OPTION(S)	No	Probably no	Probably yes	Yes		Varies	Don't know		
FEASIBILITY OF THE OPTION(S)	No	Probably no	Probably yes	Yes		Varies	Don't know		

Conclusions
Potential options for recommendations/Best practices/ important principles, implementation considerations
Options to enhance information sharing and coordination between stakeholders include:

- **Leverage existing networks/taskforces/committees across disciplines, organizations and geographic areas**
- **Tailor functional information systems to the needs of users**
- **Engage local stakeholders to guarantee flow of information across sectors**

TYPE OF RECOMMENDATION	We recommend against the option(s) ○	We suggest considering the option(s): ○ Only in the context of rigorous evaluation ○ Only in specific contexts	We recommend the option(s) ○
RECOMMENDATION			
JUSTIFICATION			
SUBGROUP/EQUITY CONSIDERATIONS			
IMPLEMENTATION CONSIDERATIONS			
MONITORING AND EVALUATION			
RESEARCH PRIORITIES			

HUMAN RESOURCES

Question 3: How to best develop and sustain emergency risk communication staff capacity for preparedness and response?

Problem (phenomenon of interest): Development and sustained capacity of staff for emergency risk communication.

Setting : In the context of preparing for and responding to national and international events/emergencies with public health implications in high, low, middle income and fragile states.

Perspective :
National governments and relevant subnational authorities (e.g., district and local health authorities)

Comparison: Foci to explore and compare: Varied tactics: in-service training, education, core competency programs, other development opportunities.

Evaluation (What happened? What worked/ impacts/consequences/ how effective?): Impact on number of staff with emergency risk communication skills, breadth/depth of skills, retention of staff

Equity considerations such as local contextual and population characteristics

Time scope: 2003 to the present

Systematic Review Findings:

A total of 24 relevant studies were identified, appraised for quality, and used for data extraction. Findings statements were formulated within methodological streams, and then synthesized across methods to provide an overview of available information and its relevance to best practices for establishing and maintaining staff capacity to respond to crisis events.

The majority of studies found were based on exercises involving tabletops, simulations, and, in a few cases, coursework or workshops. Findings synthesized across methodological streams indicate these exercises should be focused on coordinating across agencies, building skills in dealing with media, and designing messages sensitive to audience needs and comprehension. The general consensus in the literature is that tabletop and simulation exercises can and often do improve awareness and understanding.

These findings, however, come with major caveats. Limitations in methodological rigor, relevance, and adequacy of data for most findings were moderate to severe. Among the prescriptive findings identified in the review, only the suggestions that exercises should focus on coordination across agencies and incorporate training in media can be held with even a moderate level of confidence.

Some confidence can be placed in descriptive findings about current norms in ERC training. Synthesis across all methodological streams indicates that current trainings generally do not employ after action reports in a way that can promote generalized learning, contain little instruction on using social media, are mostly disaster-general, almost never employ blended online and face-to-face formats, and rarely include training in evaluation. Because these findings are descriptive, however, they can only suggest directions for future research. Separate investigations will have to be undertaken to determine what influence each of these factors has on ERC skills.

In sum, large gaps are evident in the knowledge base regarding the objective of this systematic review. We conclude that insufficient evidence exists to determine what interventions or practices are most effective in developing and sustaining capacity of ERC staff. Few studies address the issue, and most of those that do suffer from serious methodological imprecision.

Grey Literature Review Findings:

Sources addressing capacity agreed that building capacity was needed. One document reported that national capacities to detect and respond to emergencies needed to be built, along with personnel capacity, especially in rural areas (12). Another observed that the presence or absence of a risk communication plan does not necessarily indicate capacity, nor do elements of infrastructure indicate operational capabilities (13). A third stated that health communication capacity building, especially for local health agencies and personnel, has long been neglected (2). This failure to develop local risk communication capacities has led to reliance on outside experts being brought in in times of crisis (14).

Two documents addressed this imbalance in the locus of risk communication capacity. Rather than relying on outside assistance, risk communication capacity should be based at each "geographic" level, local, national, regional and global, with clearly defined roles, responsibilities and infrastructure (13). Particular focus needs to be on developing national capacities (14).

Most documents relevant to this question focused on listing the specific capacities that need strengthening. Softer communication and interpersonal skills (15, 16), along with consensus-building (including document preparation), analysis, documentation (17), monitoring and evaluation were all considered important to build (13). Staff need to learn to recognize variables known to provoke outrage, such as perceived unfairness, moral indifference, and impacts on vulnerable populations, and treat them as central to public health objectives, rather than dismiss them (18).

Other important functions in need of capacity building included strategic communication strategies, plans and standards of practice, trust building strategies and activities, and coordination skills and capacity. Stakeholder and partner communications, community engagement, socio-political, economic and cultural analysis for risk communication, and translational communication of technical expertise into understandable, contextualized material also received mention (14).

A cadre of personnel should be trained in health crises and risk communication, and refresher training provided should be provided at least annually (19) (20). Media personnel should be trained in public crisis communication (21).

In contrast to most of the documents included for this question, one study focused on staff slated for crisis deployment. It found that sharing a basic training program and actually serving in the field together helped foster trust between emergency risk communications specialists, enabling them to engage effectively more quickly upon deployment (22). Creating and maintaining a roster of such specialists, or teams of such specialists, could also represent one way to develop and sustain staff capacity.

Greater prominence needs to be given to health communication capacity building. Benchmarks need to be agreed upon, and universities need to integrate it into their courses (2).

Thirteen documents were identified as potentially relevant to the question of developing and sustaining staff capacity in emergency risk communication. Of these, eight were from high credibility sources and five from moderate.

Any other findings/evidence

No moderate or high quality existing systematic reviews were identified that were directly, indirectly, or partially relevant to training for emergency risk communication staff capacity. However, it is worth noting that scholars in emergency preparedness training and development more broadly have identified a general lack of rigor in studies of emergency preparedness training. They have observed that few standardized assessment tools exist (Gallardo, et al., 2015) and control groups are rarely used (Beerens &

Teyler, 2016). This makes it difficult to determine whether anecdotal success of drills, workshops, courses, and other types of training translate into actual additional skills and knowledge (Williams, Nocera, & Castel, 2008). Also worth noting in the broader literature is that published evaluations of disaster preparedness training and staff development are mostly confined to the United States, meaning that even if research designs were more robust, findings might not necessarily be applicable to other national contexts. The present review noted similar shortcomings in ERC training literature.

Gaps in existing research

The main gap evident in the reviewed literature is an overwhelming lack of focus on emergency risk communication. That is, emergency, risk, and crisis research may include communication as a single piece of a much broader analysis, but rarely treats it as the primary dimension of research interest. Thus, existing evidence on how best to develop and sustain capacity in ERC staff is thin, and it is difficult to avoid concluding there has been a lack of interest in determining factors that contribute to training effectiveness. Beyond this, gaps in the currently available evidence can be categorized into two major issues: lack of diversity in context and lack of methodological rigor.

Potential options for recommendations/Best practices/principles/implementation considerations

'Preparation/training exercises should focus on coordination across agencies and incorporate training in media'

Assessment

	JUDGEMENT	RESEARCH & GREY EVIDENCE	CONFIDENCE/CERTAINTY OF THE EVIDENCE (ASSESSMENT TOOL USED)
PROBLEM	**Is the problem a priority (consequences serious? urgent? policy priority?)** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies ○ Don't know	This problem is a clear priority it is impossible to provide adequate response without adequate staff preparation.	

DESIRABLE RESPONSES,&IMPACTS & EFFECTS	What happened that was desirable? What seemed to work? What were the desirable wider impacts and consequences? What had a measurable desirable effect? In what contexts and with whom? How important are the desirable anticipated responses/impacts/effects? ○ Not important ○ Somewhat Important ○ Important ○ Very important ○ Varies ○ Don't know	-There is evidence from the Middle East, Asia, and Africa that countries can work together to conduct successful exercises. Participants said more sectors should have been involved -In a tabletop exercise involving federal and state agencies as well as universities in 7 south-eastern U.S. states, it was concluded that inter-agency relationships needed to be established ahead of time to facilitate communication, and ERC was a key component. Desirable: value in heads of different agencies meeting in an environment that promoted inter-agency cooperation.	Moderate(adapted CERQual) Moderate (Adapted CERQual) Moderate (Adapted CERQual)
UNDESIRABLE RESPONSES, IMPACTS & EFFECTS	What happened that was undesirable? What did not seem to work? What were the undesirable wider impacts and consequences? What had a measurable undesirable effect? In what contexts and with whom? How important are the undesirable anticipated responses/impacts/effects? ○ Not important ○ Somewhat Important ○ Important ○ Very important ○ Varies ○ Don't know	**Undesirable**: Studies in the U.S. noted weakness in the exercise due to lack of participation by personnel from other agencies, a lack of media training (both new and traditional), limited attention to under-represented populations, a lack of detailed and generalizable lessons shared from after-action reports, and inadequate evaluation of training effectiveness.	Moderate (Adapted CERQUAL) Very low (Adapted Grade)

VALUES	Is there important uncertainty about or variability in how key stakeholders or people value and respond to the phenomena of interest/outcome? In what contexts and with whom? ○ Important uncertainty or variability ○ Possibly important uncertainty or variability ○ Probably no important uncertainty or variability ○ No important uncertainty or variability ○ Varies ○ Don't know		
RESOURCES REQUIRED	**How large are the resource requirements for the proposed option(s) (costs)?** ○ Large costs ○ Moderate costs ○ Negligible costs and savings ○ Moderate savings ○ Large savings ○ Varies ○ Don't know ○ Not applicable	No evidence in literature to permit assessment of costs	
CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES	**What is the certainty of the evidence of resource requirements for the proposed option(s) (costs)?** ○ Very low ○ Low ○ Moderate ○ High ○ No included studies ○ Not applicable	Not applicable at this time. The review does not provide clear options. Therefore, assessing cost is not possible at this time.	

EQUITY	**Does the evidence underpinning the option(s) consider health equity issues or particular contexts or subgroups?** ○ No ○ Yes ○ Varies ○ Don't know	The key concern is with under-represented and special needs populations. Although the need to adapt ERC to reach and interact with members of these populations is documented in the literature. The literature we identified devoted little time to these audiences. The work was focused largely on the West and Europe.	
ACCEPTABILITY	**Is the option(s) acceptable to key stakeholders?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies ○ Don't know	We cannot draw a clear conclusion.	
FEASIBILITY	**Is the option(s) feasible to implement?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies ○ Don't know	We cannot draw a clear conclusion.	

Suggested recommendation:

Preparation/training exercises should focus on coordination across agencies and incorporate training in media

Summary of judgements

	JUDGEMENT								IMPLICATIONS
PRIORITY PROBLEM	No	Probably no	Probably yes	Yes		Varies	Don't know		
HOW IMPORTANT ARE THE DESIRABLE RESPONSES, IMPACTS & EFFECTS?	Not important	Somewhat important	Important	Very Important		Varies	Don't know		
HOW IMPORTANT ARE THE UNDESIRABLE RESPONSES, IMPACTS & EFFECTS?	Not important	Somewhat important	Important	Very Important		Varies	Don't know		
CERTAINTY/CONFIDENCE OF EVIDENCE BY EVIDENCE TYPE **ADD SEPARATE RATINGS FOR:** **GRADE** **ADAPTED GRADE** **CERQUAL** **ADAPTED CERQUAL**	Very low **Very Low** Very Low Very Low	Low Low Low Low	Moderate Moderate Moderate **Moderate**	High High High High			**No included studies** No included studies No included studies No included studies		
VALUES	Important uncertainty or	Possibly important uncertainty or	Probably no important uncertainty or	No important uncertainty or		Varies	Don't know		

	JUDGEMENT								IMPLICATIONS
	variability	variability	variability	variability					
RESOURCES REQUIRED	Large costs	Moderate costs	Negligible costs and savings	Moderate savings	Large savings	Varies	Don't know	N/A	
CERTAINTY OF EVIDENCE FOR REQUIRED RESOURCES	Very low	Low	Moderate	High			No included studies	N/A	
COST EFFECTIVENESS	Favours the comparison	Probably favours the comparison	Does not favour either the intervention or the comparison	Probably favours the intervention	Favours the intervention	Varies	No included studies	N/A	
DOES THE EVIDENCE CONSIDER EQUITY ISSUES?	No			Yes		Varies	Don't know		
ACCEPTABILITY OF THE OPTION(S)	No	Probably no	Probably yes	Yes		Varies	Don't know		
FEASIBILITY OF THE OPTION(S)	No	Probably no	Probably yes	Yes		Varies	Don't know		

Conclusions

Should

"Preparation/training exercises should focus on coordination across agencies and incorporate training in media"

be recommended?

TYPE OF RECOMMENDATION	We recommend against the option(s) ○	We suggest considering the option(s): ○ Only in the context of rigorous evaluation ○ Only in specific contexts	We recommend the option(s) ○
RECOMMENDATION			
JUSTIFICATION			
SUBGROUP/EQUITY CONSIDERATIONS			
IMPLEMENTATION CONSIDERATIONS			
MONITORING AND EVALUATION			
RESEARCH PRIORITIES			

FINANCING

Question 4: How to ensure sufficient and sustainable financing for emergency risk communication?

Problem (phenomenon of interest): Approaches and timing of funding for emergency risk communication,

Setting : In the context of preparing for and responding to national and international events/emergencies with public health implications in high, low, middle income and fragile states.

Perspective : Donors, national budget holders

Comparison (Foci to explore and compare): Experiences in different political and economic contexts and related to different magnitude of events

Evaluation (What happened/ what worked/consequences/impact / how effective?): Amount/proportion of funding for emergency risk communication relative to all funding allocated to emergency preparedness and management, and timing of this funding.

Time scope: 2003 to present

Systematic Review Findings:

341 potentially relevant documents were identified. By far the majority of these have not directly discussed risk communications funding. They have mentioned financing mechanisms, such as microcredit, insurance, pool funds, etc. to be used for disaster risk management (DRM). Many have also mentioned risk communication or public awareness raising/education as part of disaster risk reduction (DRR). Some have mentioned that even where DRR awareness/education materials exist, the prevention messages have not made it down to the local level. Others have mentioned the need for governments to dedicate funds (for example 1% of the national budget)

to DRR/DRM. Nearly all have listed funding as a major challenge for DRR/DRM, with some noting that it falls into a gap between development and relief programs, and therefore is funded by neither. Another frequent message was the need to combine DRR/DRM and Climate Change Adaptation (CCA) funding and efforts.

For most records, especially if no abstract was provided (which has frequently been the case), the searcher included in the abstract field a short summary of what was seen in a quick scan of each document (for example, NOTE: Does NOT discuss risk communication funding...).

There is little (if any) evidence that usefully addresses the question.

Additional Grey Literature Review Findings:

Similar to the previous literature review conducted for the question of sustainable financing for emergency risk communication (23), this quick review of grey literature found very little relevant material. Of included sources, 26 mentioned financing or funding in some way, 12 of which had high credibility sources and 14 moderate. Several of these discussed health funding in general or for specific programs, without mentioning risk communication funding (3, 7, 10, 24-31). Others mentioned specific amounts allocated for risk communication activities, but these were one-off grants, and therefore not sustainable funding sources (32-38).

Although several called for increased funding from national governments and donors, or expressed need of it (2, 3, 39), real action in terms of supplying such funds, except as if in afterthought, appeared scarce (2).Several sources referenced WHO's new Health Emergency Programme. While true that the Programme's mandate and budget include risk communication, this still does not answer the question of sustainable risk communication funding, as the Programme itself needs sustainable funding (1). Furthermore, funding public health systems, emergency or otherwise, remains a responsibility primarily of domestic budgets (1).

Several mechanisms for sustainable funding were suggested, such as a combination of varying levels of domestic funding coupled with funding from other sources for LMIC, but no information about the effectiveness of such mechanisms was provided (1). One source mentioned user fees, taxes and donor support as possible ways of funding health care, noting that user fees are the least equitable of these mechanisms as they punish the poor (26). Another suggested that funding previously earmarked for polio now be used for social mobilization for general health education (6). A third report noted that Congress did not approve additional funding for Zika prevention, so the CDC has taken money previously marked for local health department preparedness and reassigned it to the national Zika campaign (40). Rather than being an example of sustainable funding, this seems a case of robbing one part of a programme to pay another.

One thing several reports seemed to agree on: A number of reports mentioned that lack of funding hampered initial risk communication efforts at the beginning of the West African Ebola outbreak (36, 41-43).

Any other findings/evidence

Nil

Potential option for recommendation/Best practices/principle/implementation considerations

`Emergency risk communications requires a defined budget which should be a part of core budgeting for emergency preparedness and response`

Assessment

	JUDGEMENT	RESEARCH & GREY EVIDENCE
PROBLEM	**Is the problem a priority?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies ○ Don't know	Search identified documents mentioning need for governments to dedicate funds Grey lit found documents which called for increased funding from national governments and donors, or expressed need of it (2, 3, 39), real action in terms of supplying such funds, except as if in afterthought, appeared scarce (2).Several sources referenced WHO's new Health Emergency Programme. While true that the Programme's mandate and budget include risk communication, this still does not answer the question of sustainable risk communication funding, as the Programme itself needs sustainable funding (1). Furthermore, funding public health systems, emergency or otherwise, remains a responsibility primarily of domestic budgets (1). Of included sources, 26 mentioned financing or funding in some way, 12 of

		which had high credibility sources and 14 moderate.
DESIRABLE RESPONSES,&IMPACTS & EFFECTS	What happened that was desirable? What seemed to work? What were the desirable wider impacts and consequences? What had a measurable desirable effect? In what contexts and with whom? How important are the desirable anticipated responses/impacts/effects? ○ Not important ○ Somewhat Important ○ Important ○ Very important ○ Varies ○ Don't know	Systematic review: No evidence of outcomes or what works Grey lit: Several mechanisms for sustainable funding were suggested, such as a combination of varying levels of domestic funding coupled with funding from other sources for LMIC, but no information about the effectiveness of such mechanisms was provided (1).
UNDESIRABLE RESPONSES, IMPACTS & EFFECTS	What happened that was undesirable? What did not seem to work? What were the undesirable wider impacts and consequences? What had a measurable undesirable effect? In what contexts and with whom? How important are the undesirable anticipated responses/impacts/effects? ○ Not important ○ Somewhat Important ○ Important ○ Very important ○ Varies ○ Don't know	Systematic Review: No evidence Grey lit noted that the US Congress did not approve additional funding for Zika prevention, so the CDC has taken money previously marked for local health department preparedness and reassigned it to the national Zika campaign (40). Rather than being an example of sustainable funding, this seems a case of robbing one part of a programme to pay another. Grey lit: One source mentioned user fees, taxes and donor support as possible ways of funding health care, noting that user fees are the least equitable of these mechanisms as they punish the poor (26)
CERTAINTY/CONFIDENCE OF EVIDENCE	What do the GRADE, adapted GRADE and GRADE CERQual and adapted GRADE CERQual assessments of Certainty/Confidence indicate for these findings? GRADE: ○ Very low ○ Low ○ Moderate	Grey Literature: 26 sources mentioned financing or funding in some way, 12 of which had high credibility sources and 14 moderate.

	○ High ○ No included studies Adapted GRADE: ○ Very low ○ Low ○ Moderate ○ High ○ No included studies GRADE CERQual: ○ Very low ○ Low ○ Moderate ○ High ○ No included studies Adapted GRADE CERQual: ○ Very low ○ Low ○ Moderate ○ High ○ No included studies	
VALUES	Is there important uncertainty about or variability in how key stakeholders or people value and respond to the phenomena of interest/outcome? In what contexts and with whom? ○ Important uncertainty or variability ○ Possibly important uncertainty or variability ○ Probably no important uncertainty or variability ○ No important uncertainty or variability	

	○ Varies ○ Don't know	
RESOURCES REQUIRED	**How large are the resource requirements for the proposed option(s) (costs)?** ○ Large costs ○ Moderate costs ○ Negligible costs and savings ○ Moderate savings ○ Large savings ○ Varies ○ Don't know ○ Not applicable	
CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES	**What is the certainty of the evidence of resource requirements for the proposed option(s) (costs)?** ○ Very low ○ Low ○ Moderate ○ High ○ No included studies ○ Not applicable	
EQUITY	**Does the evidence underpinning the option(s) consider health equity issues or particular contexts or subgroups?** ○ No ○ Yes ○ Varies ○ Don't know	

ACCEPTABILITY	**Is the option(s) acceptable to key stakeholders?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies ○ Don't know	
FEASIBILITY	**Is the option(s) feasible to implement?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies ○ Don't know	

Potential option for recommendation/Best practices/principle/implementation considerations

- **Emergency risk communications requires a defined budget which should be a part of core budgeting for emergency preparedness and response**

Summary of judgements

	JUDGEMENT								IMPLICATIONS
PRIORITY PROBLEM	No	Probably no	Probably yes	Yes		Varies	Don't know		
HOW IMPORTANT ARE THE DESIRABLE RESPONSES, IMPACTS & EFFECTS?	Not important	Somewhat important	Important	Very Important		Varies	Don't know		
HOW IMPORTANT ARE THE UNDESIRABLE RESPONSES, IMPACTS & EFFECTS?	Not important	Somewhat important	Important	Very Important		Varies	Don't know		
CERTAINTY/CONFIDENCE OF EVIDENCE BY EVIDENCE TYPE **ADD SEPARATE RATINGS FOR:** **GRADE** **ADAPTED GRADE** **CERQUAL** **ADAPTED CERQUAL**	Very low Very Low Very Low Very Low	Low Low Low Low	Moderate Moderate Moderate Moderate	High High High High			No included studies No included studies No included studies No included studies		
VALUES	Important uncertainty or variability	Possibly important uncertainty or variability	Probably no important uncertainty or variability	No important uncertainty or variability		Varies	Don't know		

	JUDGEMENT								IMPLICATIONS
RESOURCES REQUIRED	Large costs	Moderate costs	Negligible costs and savings	Moderate savings	Large savings	Varies	Don't know	N/A	
CERTAINTY OF EVIDENCE FOR REQUIRED RESOURCES	Very low	Low	Moderate	High			No included studies	N/A	
COST EFFECTIVENESS	Favours the comparison	Probably favours the comparison	Does not favour either the intervention or the comparison	Probably favours the intervention	Favours the intervention	Varies	No included studies	N/A	
DOES THE EVIDENCE CONSIDER EQUITY ISSUES?	No			Yes		Varies	Don't know		
ACCEPTABILITY OF THE OPTION(S)	No	Probably no	Probably yes	Yes		Varies	Don't know		
FEASIBILITY OF THE OPTION(S)	No	Probably no	Probably yes	Yes		Varies	Don't know		

Conclusions

Potential option for recommendation/Best practices/principle/implementation considerations

- **Emergency risk communications requires a defined budget which should be a part of core budgeting for emergency preparedness and response**

TYPE OF RECOMMENDATION	We recommend against the	We suggest considering the	We recommend the option(s)

	option(s) ○	option(s): ○ Only in the context of rigorous evaluation ○ Only in specific contexts	○
RECOMMENDATION			
JUSTIFICATION			
SUBGROUP/EQUITY CONSIDERATIONS			
IMPLEMENTATION CONSIDERATIONS			
MONITORING AND EVALUATION			
RESEARCH PRIORITIES			

TRUST

Question 5: What are the best and most generalizable emergency risk communication activities that build trust in health authorities as a source of health protection information among affected communities and other stakeholders?

Problem (phenomenon of interest): Emergency risk communication activities that build trust in health authorities as a source of health protection information among affected communities and other stakeholders

Setting: In the context of preparing for and responding to national and international events/emergencies with public health implications in high, low, middle income and fragile states.

Perspective: National governments and relevant subnational authorities (e.g., local/district health departments), affected communities, stakeholders

Comparison (Foci to explore and compare): Listening (acknowledging and responding to audience concerns/questions), early announcements, consistency of messages, strength of pre-existing relationships, use of skilled/credible spokespersons, admitting mistakes, acknowledging uncertainties, public release of evaluations and reviews, use of local spokespersons and influencers. Equity considerations such as local contextual and population characteristics.

Evaluation (What happened/ what worked/consequences/impact / how effective?): Impact on levels of accurate knowledge and compliance with health recommendations among affected populations, perceptions of credibility of health authorities among affected populations and other stakeholders

Time: 2003 to present

Systematic Review Findings:

The country coverage of the reviewed literature showed mostly high and middle-income countries in Asia, Europe, North America, and Oceania. The event most covered was infectious disease; other relatively common events included floods, earthquake and volcanic, bioterrorism, foodborne illnesses, and radiological/ radiation.The other UN languages studies commonly focused on general, rather than specific, public health emergencies. All four event phases were covered though there was heavy emphasis on the preparation phase, followed by onset and containment phases; relatively there was much less coverage of the recovery phase. There were also very few studies that undertook evaluation.

The findings in various ways cover the following: structure/ components of trust (in the context of emergency health events); the life circumstances in which trust as a phenomenon is experienced; the role of trust in the common situation of multiple information sources; the variability in trust across contexts; trust as an outcome of different factors; and trust as a predictor of different outcomes. There are several organizational message and action factors that can predict higher trust. Among these especially are: Acknowledging uncertainty in messages, including forecasts and warnings; being transparent and not concealing negative information, such as rates of casualties; speedily disseminating information and intervening; creating scientific communication in an easy to understand manner; seeking input from the public and encouraging a dialog; ensuring coordination between different health authorities and the media along with a uniform message; avoiding rapid changes in information and preventing conflicting information dissemination from different agencies; and disseminating information through multiple platforms. It is important to note that these actions occur in a larger context that includes factors such as different components of trust, history with authorities and life circumstances of the public, person/ individual differences, all of which can both strengthen or weaken the message-trust relationship.

The present findings broadly replicate and extend the previous findings about organizational actions and messages that can enhance trust. Some new findings are highlighted in the present review.

Additional Grey Literature Review Findings:

One of the most important steps toward building trust is community engagement, the grey literature was nearly unanimous about this. Community engagement builds trust, and greater trust fosters community engagement. Because of this overlap, much of what pertains to trust-building is covered in Question 9. Rather than duplicate this, examination of lessons learned here will be limited to those which were listed nearly exclusively in relation to trust-building.

The populations of all three countries most strongly hit by the Ebola outbreak, Guinea, Liberia and Sierra Leone, displayed strong mistrust of government and outsiders. Their political realities played crucial roles in this situation(7): All three recently experienced devastating civil wars. All three had ethnic diversity, with tensions between ruling parties and those groups not in power. Other factors contributing to mistrust included the legacy of colonialism, attempts to “modernize” that involved efforts to eliminate traditional religion, lack of local representation in government, and the necessity of frequently having to bribe authorities just to get through daily life. This lack of trust gave rise to vicious rumours (government plots to market human organs or eliminate minority populations) and hampered response efforts in general (42-45). Initial messages warning people not to eat bush meat further increased mistrust, as local populations recognized that this did not explain Ebola transmission (45-47). Political pressure undermined transparency and trust, as did measures of force, such as placing over a million people under quarantine, or state-enforced cremation (13, 43, 48).

Although written about communications experts trained for deployment by WHO to emergency situations (Emergency Communications Networks or ECN), Bastide's study shed light on why certain types of interventions build trust. One thing these networks succeeded at is spreading trust. Bastide noted that this trust comes from shared experience. People have trained together or have already worked together, so they share common experiences, which builds bonds and generates complicity trust. Sharing a base of technical skills, norms and values fosters recognition trust. The study further noted that complicity trust is deeper and stronger than recognition trust, because it is emotional and involves intimate experience of those trusted (22).

As mentioned above, community engagement and building trust work together. The single greatest factor in successful community engagement was maximum local involvement (see the discussion of Question 9, below). Local populations come with ready-made complicity and recognition trust. They share both experiences and a common set of life skills, norms and values. However, as one report noted, not all locals have equal trust-building effect. Some leaders were not trusted, and some people did not trust those being paid to do Ebola work (49). Use of volunteers helped address this latter issue.

Trust in health systems is based not only on objective measures of these systems (the number of facilities or quality of service delivered), but also on people's perceptions of these systems. If people think a system is unlikely to help them, they will not use it. Once again engaging people is the solution, for example, by involving people in service delivery meetings (15, 50).

Healthcare workers treating people disrespectfully erodes trust. Staff needed training/development of softer communication and interpersonal skills to help build trust (15, 50, 51). One report also noted that providing mental health services to healthcare workers helped relieve their stress and enabled them to interact better with members of the public, thereby also helping to build trust (51).

Timing also plays a role in trust building. Communication needs to acknowledge a crisis immediately and be open about uncertainties (13).

Of the 17 documents referenced in this section of the report, 11 were from high and six from moderately credible sources.

Any other findings/evidence:

Speed and accessibility of information can ameliorate lack of trust (from evidence review for Q7)

Gaps in the literature:

The present review identified several gaps in the literature. These include, insufficient coverage of low income countries; lack of comprehensive examination of the various components of trust along with concepts that substantially overlap with trust but may behave somewhat differently, such as confidence; absence of longitudinal studies; and insufficient research on how mass media and personal networks interact during events.

Potential options emerging for recommendation(s)/best practice(s)/ overarching principle (s) implementation consideration (s)

- **One of the most important steps toward building trust is community engagement**
- **Trust in authorities is a multi-component construct and not a singular concept, which needs to be kept in mind when developing any message strategies;**
- **People engage in a thoughtful process of considering multiple sources offering information and recommendations, and use source credibility for resolving the conflict among the many pieces of information**
- **Trust in authorities occurs in a general life context and should not be seen narrowly in isolation for just a specific hazard or emergency event**
- **Speed and accessibility of information can ameliorate lack of trust (this from review for Q7)**
- **(note some crossover with findings from question2/6)**

Building trust requires:

- coordination with other agencies, institutions, and the media;
- swift and uniform message dissemination and intervention;
- communicating uncertainties;
- being transparent and not concealing negative data;
- avoiding rapid changes in information and preventing conflicting information dissemination from different agencies;
- disseminating information through multiple platforms;
- sustaining public involvement and dialogue
- using spokespeople from more trusted groups e.g public health officials, scientists.

Potential recommendation:

Use people from trusted professions, groups, organizations as spokespersons

Decision point: Are these recommendations? Best practices? Overarching principles? Implementation considerations?

Assessment

	JUDGEMENT	RESEARCH & GREY EVIDENCE	CERTAINTY/CONFIDENCE IN THE EVIDENCE
PROBLEM	**Is the problem a priority?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies (e.g. depends on context) ○ Don't know	**Grey lit:** The populations of all three countries most strongly hit by the Ebola outbreak, Guinea, Liberia and Sierra Leone, displayed strong mistrust of government and outsiders. Their political realities played crucial roles in this situation(7): All three recently experienced devastating civil wars. All three had ethnic diversity, with tensions between ruling parties and those groups not in power. Other factors contributing to mistrust included the legacy of colonialism, attempts to "modernize" that involved efforts to eliminate traditional religion, lack of local representation in government, and the necessity of frequently having to bribe authorities just to get through daily life. This lack of trust gave rise to vicious rumours (government plots to market human organs or eliminate minority populations) and hampered response efforts in general (42-45). Initial messages warning people not to eat bush meat further increased mistrust, as local populations recognized that this did not explain Ebola transmission (45-47). Political pressure undermined transparency and trust, as did measures of force, such as placing over a million people under quarantine, or state-enforced cremation (13, 43, 48)	
DESIRABLE RESPONSES,& IMPACTS & EFFECTS	What happened that was desirable? What seemed to work? What were the desirable wider impacts and consequences? What had a measurable desirable effect? In what contexts and with whom? How important are the desirable anticipated responses/impacts/effects? ○ Not important ○ Somewhat Important ○ Important ○ Very important ○ Varies ○ Don't know	**What worked?** **Systematic review**: In Japan for a radiological event for recovery phase, crisis communication via Facebook (compared to Twitter and print newspaper) can result in a more positive perception of organizational reputation. (somewhat important) In India, Thailand, and France, for floods, cyclones, and industrial events, and for preparation, onset, and recovery phases, including evaluation, trust in authorities can be enhanced by communication of uncertainty. Credibility of warning messages can also be improved by communicating uncertainty. This is particularly important as the experience about the credibility of the message in a current hazard event can affect the response to the next future event. (very important) (best practice) In Japan, Oman, and France, for cyclone and flood events, and for preparation, onset, and recovery phases along with evaluation, trust as an outcome is predicted by characteristics of messages sent by organizations. (important) (principle) In China, for infectious disease, earthquake, and general public health emergency events, and for containment and recovery phases, trust varies across media sources. Trust for information from traditional media is higher than information from the Internet. However, trust for information from Weibo/ social media and the Internet can sometimes be higher than from television. (important) (principle)	Certainty/confidence appraised as : Moderate Moderate Moderate Moderate

		In Canada, France, and in general globally, for food contamination, floods, and general natural disaster events, for preparation, onset, and containment phases, including evaluation, and for low-SES groups, trust as an outcome can be predicted by public engagement and participation. (very important) (recommendation)	Moderate
		In the United States, several European countries, and the United Kingdom, for foodborne illness, infectious disease, cancer clusters, climate change related severe weather, and water contamination, and for all four phases, trust varies across different information sources. Local public health officials are usually near the top of the trust rankings whereas there is a low trust for local elected officials. Also trusted are personal health professionals, and family, friends, and neighbours. Generally people do not trust media or government communication relative to communication from scientists. (very important) (best practice)	High
		In Canada and several European countries, for infectious disease and flooding, and for preparation, onset, and containment phases along with evaluation, trust in governmental authorities can be increased by: quickly educating the public and rapidly intervening; developing new information systems to respond quickly and efficiently; create scientific communication (e.g., flood plain maps) in an easy to understand manner; seek input from the public and encourage a dialog; ensure coordination between different health authorities and the media along with a uniform message; avoid rapid changes in information and prevent conflicting information; disseminate information through multiple platforms; and provide information about uncertainties and dangers. (very important) (best practice)	High
		In Singapore, Canada, and several European countries, for infectious disease and petroleum spill events, and for all four phases as well as evaluation, when health professionals, experts, and politicians, have clear coordination among themselves and with the traditional and social/ digital media, and all relay a uniform communication strategy, there is higher trust. (important) (recommendation)	Moderate
		Grey lit: Bastide noted that trust comes from shared experience. People have trained together or have already worked together, so they share common experiences, which builds bonds and generates complicity trust. Sharing a base of technical skills, norms and values fosters recognition trust. The study further noted that complicity trust is deeper and stronger than recognition trust, because it is emotional and involves intimate experience of those trusted (22) Healthcare workers treating people disrespectfully erodes trust. Staff needed training/development of softer communication and interpersonal skills to help build trust (15, 50, 51). One report also noted that providing mental health services to healthcare workers helped relieve their stress and enabled them to interact better with members of the public, thereby also helping to build trust (51). Timing also plays a role in trust building. Communication needs to acknowledge a crisis immediately and be open about uncertainties (13)	

UNDESIRABLE RESPONSES, IMPACTS & EFFECTS	What happened that was undesirable? What did not seem to work? What were the undesirable wider impacts and consequences? What had a measurable undesirable effect? In what contexts and with whom? How important are the undesirable anticipated responses/impacts/effects? ○ Not important ○ Somewhat Important ○ Important ○ Very important ○ Varies ○ Don't know	**What did not work or had undesirable consequences?** **Systematic review**: In the United States for an infectious disease event for onset and containment phases, trust in authorities may show a slight decrease as a result of openly acknowledging uncertainties in messages. However, this decrease is only for a small proportion of the total number of message recipients; for the vast majority of message recipients, there is no change in their level of trust. (important) In India, for cyclone event, and for preparation and onset phases, experience about the credibility of the message in a current hazard event can affect credibility of and the response to warning in the next future event. Greater the experience of false alarms, lesser is the tendency to respond to warnings in the future (very important) (best practice) In Thailand and the United States, for bioterrorism and industrial accident events, for all four phases, and for urban minority African American and Hispanic populations, trust can be associated with negative affect. If individuals believe that officials will be honest and forthcoming with negative information, they will tend to feel less reassured/ more fearful by the acknowledgment of risk uncertainties. (important)	Low to moderate Moderate Moderate
VALUES		Review In the United States and China, for bioterrorism, radiological, infectious disease, and floods events, for preparation phase, and for mothers of young children, urban low SES minorities, and underserved urban and rural communities, there are variations in trust across different sources. There is greater receptiveness to information delivered by local agencies. There can be deep distrust for government agencies, police, and local elected officials.	Overlapping findings by 6 studies, individually appraised as high (1), moderate (4), and low (1).
RESOURCES REQUIRED			

CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES			
EQUITY	**Does the evidence underpinning the option(s) consider health equity issues or particular contexts or subgroups?** ○ No ○ Yes ○ Varies ○ Don't know	Trust in authorities as an outcome is predicted by several person-level factors that should be taken into account when developing communication strategies. Some important factors are: exposure and attention to news about the event; self-reported knowledge of event; self-reporting of local impacts of event; previous experience of discrimination; ability to articulate problems and empowerment to achieve goals; involvement, engagement, and participation with issue; low political conservatism and being a Democrat (relative to other, non-Republican partisans); communitarianism (low individualism); concern with risk of hazard; and perception of consensual values with and sympathy for organization. Countries covered include Australia, Canada, France, general global, Japan, New Zealand, and the United States. Events include earthquake, floods, food contamination, infectious disease, general natural disaster, volcanic activity, and wildfire. The preparation, onset, and containment phases were covered, with emphasis on preparation; evaluation was also covered. Low-SES vulnerable population was covered. The pattern of trust in authorities in all vulnerable groups must not be assumed to be similar. For example, there are differences between urban African American and Hispanic minorities in the United States with regards to judgements of trustworthiness of health and other related agencies.	7 studies (Grade adapted: Low to High)
ACCEPTABILITY	**Is the option(s) acceptable to key stakeholders?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies ○ Don't know	There are no studies that directly addressed this. However, there can be resistance to communicating uncertainties by some stakeholders.	

FEASIBILITY	**Is the option(s) feasible to implement?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies ○ Don't know		

Potential recommendation:

Use people from trusted professions, groups, organizations as spokespersons

Summary of judgements

	JUDGEMENT								IMPLICATIONS
PRIORITY PROBLEM	No	Probably no	Probably yes	Yes		Varies	Don't know		
HOW IMPORTANT ARE THE DESIRABLE RESPONSES, IMPACTS & EFFECTS?	Not important	Somewhat important	Important	Very Important		Varies	Don't know		
HOW IMPORTANT ARE THE UNDESIRABLE RESPONSES, IMPACTS & EFFECTS?	Not important	Somewhat important	Important	Very Important		Varies	Don't know		
CERTAINTY/CONFIDENCE OF EVIDENCE BY EVIDENCE TYPE **ADD SEPARATE RATINGS FOR:** **GRADE** **ADAPTED GRADE** **CERQUAL** **ADAPTED CERQUAL**	 Very low Very Low Very Low Very Low	 Low Low Low Low	 Moderate Moderate Moderate Moderate	 High High High High			 No included studies No included studies No included studies No included studies		
VALUES	Important uncertainty or variability	Possibly important uncertainty or variability	Probably no important uncertainty or variability	No important uncertainty or variability		Varies	Don't know		

	JUDGEMENT								IMPLICATIONS
RESOURCES REQUIRED	Large costs	Moderate costs	Negligible costs and savings	Moderate savings	Large savings	Varies	Don't know	N/A	
CERTAINTY OF EVIDENCE FOR REQUIRED RESOURCES	Very low	Low	Moderate	High			No included studies	N/A	
COST EFFECTIVENESS	Favours the comparison	Probably favours the comparison	Does not favour either the intervention or the comparison	Probably favours the intervention	Favours the intervention	Varies	No included studies	N/A	
DOES THE EVIDENCE CONSIDER EQUITY ISSUES?	No			Yes		Varies	Don't know		
ACCEPTABILITY OF THE OPTION(S)	No	Probably no	Probably yes	Yes		Varies	Don't know		
FEASIBILITY OF THE OPTION(S)	No	Probably no	Probably yes	Yes		Varies	Don't know		

Potential recommendation:

Use people from trusted professions, groups, organizations as spokespersons

TYPE OF RECOMMENDATION	We recommend against the option(s) ○	We suggest considering the option(s): ○ Only in the context of rigorous evaluation ○ Only in specific contexts	We recommend the option(s) ○
RECOMMENDATION			
JUSTIFICATION			
SUBGROUP/EQUITY CONSIDERATIONS			
IMPLEMENTATION CONSIDERATIONS			
MONITORING AND EVALUATION			
RESEARCH PRIORITIES			

STRATEGIC COMMUNICATION PLANNING

Question 7: What are the elements and steps of effective, strategic communication planning?

Problem (phenomenon of interest): Approaches to strategic communication planning including types of participants, planning processes, and components of resulting plans

Setting: In the context of preparing for and responding to national and international events/emergencies with public health implications in high, low, middle income and fragile states.

Perspective : National governments and relevant subnational authorities (e.g., local/district health departments), responding and implementing partners

Comparison (Foci to explore and compare): All hazards versus specific threats; varied development processes, data-driven versus best practices, inclusion of metrics/indicators. Equity considerations such as local contextual and population characteristics.

Evaluation (What happened/ what worked/consequences/impact / how effective?): Impact on breadth/generalizability of resulting plan, feasibility of implementation, buy-in of leadership and implementers

Date: 2003

Systematic Review Findings:

The studies in the present review demonstrate the importance of merging scientific expertise with local knowledge (firsthand experience) of the communities affected by a public health emergency event. Strategic planning efforts must take into account the role of culture in preparation and response in order to contextualize efforts to meet the needs of diverse populations. Efforts across event phases must involve local stakeholders, who play an important role in communicating key messages and moving populations from awareness to action.

Research has focused on disaster response, helping us to understand the steps necessary to mitigate disaster situations. However, the studies in the present review encourage more proactive efforts devoted to disaster preparedness, particularly in regions and communities with populations that may be de-sensitized to the threat and harm caused by disaster, and who, because of previous history with disaster situations, may have low risk perception. With these populations, increased information does not automatically lead to behavioral change; it is important to use multiple channels and means of communicating to reach them. This involves moving beyond traditional forms of mass mediated communication to more localized forms of communication, including but not limited to, use of community and family members to spread key messages, intervention programs, long-term awareness campaigns, and making information available through community centers, religious centers, and other important facilities these populations access for information in a disaster.

The findings of the present review largely align with the conclusions of existing reviews. These include, need for various health agencies, emergency systems, and other public services to collaborate and establish communication networks in preparation for events; communication must consider the communities, cultures, and lifestyles of different segments of the public, and further, design disaster education and preparation around these social structures; and risk perception is the primary predictor for disaster prevention and mitigation behaviors, and moreover, the risk perception is itself determined by a variety of factors, including knowledge of disasters, trust in officials, and demographic characteristics.

The types of public health emergency events/ disasters most often studied were seismic events such as earthquakes and tsunamis; weather phenomena such as storms and floods; and emerging infectious diseases. Most studies were based on data from smaller sample sizes, which makes it unlikely that researchers garnered samples fully representative of affected populations. Finally, few studies focused on specific strategies that made a clear connection between increased information during the planning/ preparation phase and action change during the onset, containment, and recovery phases.

GAPS

Overall, gaps in the reviewed literature showed that studies in the present review were overwhelmingly slanted toward populations in the United States with some studies in Australia, Africa, and some Asian countries such as China and Japan, and Eastern Europe. Roughly half of the studies focused on the onset phase and just over half the studies focused on the evaluation phase.

Additional Grey Literature Review Findings:

According to the grey literature, effective, strategic communication planning begins long before a crisis and involves a number of steps. A number of documents found that groundwork needs to be laid before an emergency. This includes creating a strategy and framework for communicating with all stakeholders, developing and vetting basic messages for issues likely to arise during a crisis, training communications personnel, and developing a system for rapid message review and approval (4, 14, 18, 19, 52). Roles and responsibilities should be outlined and clearly defined (14, 52), and a network of communication partnerships should be created and maintained. A plan for working with the media should be developed (14, 18, 21, 52), as should a media toolkit (52). Adequate and timely funding should be secured (2).A second finding was that the communication process needs to start early (42). An essential beginning step of communication planning is to discuss the situation with community leaders and members and to conduct an initial assessment. This helps identify the best communication channels to use and any barriers or potential problems, as well as potential solutions (24, 60).

One study noted that medical anthropological assessment should be used at the beginning of a response, so that messages and responses can be shaped accordingly (61). This assessment should include listening to complaints and taking into account the customs and cultures of all involved groups (18, 44). Top-down communication should be avoided, as this can exclude and alienate people (62). Instead, messages should be tailored to their target groups (52).

An example of these steps was provided by the Community Led Ebola Management and Eradication (CLEME) approach. CLEME started with an assessment of the situation, community mapping, collecting information about caring for the sick and the dead and a walk-through of the community. As a community, interventions were decided upon, tailored for specific groups and implemented. Contextual analysis, follow-up visits and feedback shaped intervention adjustments on an on-going basis. Ebola and other health education was then to be integrated into all community programs to prevent future outbreaks (63).

Once initial messages were disseminated, it was important to monitor their effectiveness and adjust them as necessary. One option for this was to use barrier analysis, comparing those who had adopted behaviour changes with those who had not, to help elucidate barriers to change, uncover perceived positive and negative consequences of behaviour changes, and fine tune messages accordingly (49). Social mobilizers could be used in this process. They could listen for misinformation and rumours, which could then be addressed swiftly (14, 21, 24). Two documents noted that the process of listening to the community, taking their concerns seriously and adapting messages accordingly should continue throughout the emergency (18, 21).

Additional elements of good communications planning were found to include distinguishing evidence-based messages from uncertain ones (36), ensuring that lessons learned are captured and applied (2, 21), and building local communication capacities (14, 36).

For this question, 16 potentially relevant documents were identified, 11 from sources of high credibility and five from moderate.

Potential options for recommendations/Best practices/important principles, implementation considerations

Emergency risk communication planning must be participatory, responsive to context and be a continuous process incorporating feedback from affected groups with a focus on preparedness, not just response

Implementation considerations:

- Planning functions best through collaboration among constituent groups. Health agencies, emergency systems, and other public services need to collaborate and establish communication networks in preparation for events.
- Communication planning must consider the communities, cultures, and lifestyles of different segments of the public and further, design disaster education and preparation around these social structures
- Involve multiple channels and means of communicating disaster messages
- Potentially affected communities must be involved at the planning stage.
- Planning should include establishment of mechanisms for monitoring and assessing effectiveness of messages and adjusting them as necessary

Assessment

	JUDGEMENT	RESEARCH & GREY EVIDENCE	RATING OF CERTAINTY
PROBLEM	**Is the problem a priority?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies ○ Don't know	Yes. The studies in the present review demonstrate the importance of merging scientific expertise with local knowledge (first hand experience) of the communities affected by a public health emergency event. Strategic planning efforts must take into account the role of culture in preparation and response in order to contextualize efforts to meet the needs of diverse populations. Efforts across event phases must involve local stakeholders, who play an important role in communicating key messages and moving populations from awareness to action. Without the ability to assess and evaluate the activities associated with disaster response it will be difficult to improve public awareness and potentially to influence the behaviour of populations affected by these events. Addressing this problem can help governments, public health officials, and other responding personnel develop the right combination of strategies to better plan for these occurrences and meet the needs of communities in the greatest distress.	Moderate (all tools)

DESIRABLE RESPONSES,&IMPACTS & EFFECTS	What happened that was desirable? What seemed to work? What were the desirable wider impacts and consequences? What had a measurable desirable effect? In what contexts and with whom?	**What worked**? **Strategic planning efforts contextualized** for the diversity of populations involved in disaster situations; learning more about regions with more vulnerable populations, expanding the knowledge base among response personnel regarding the characteristics of vulnerable populations and how their status impacts threat perception, risk perception, capacity to evacuate and potential for behavioural change.	Moderate (GRADE) Moderate High (GRADE Adapted) Moderate to High (CERQual) High (CERQual adapted)
	How important are the desirable anticipated responses/impacts/effects? ○ Not important ○ Somewhat Important ○ Important ○ Very important ○ Varies ○ Don't know	Studies from Canada, U.S., Egypt, Saudi Arabia, China and Spain recommend that officials **engage the public** during planning and decision-making stages of disaster management in order to best address the needs of citizens and to promote goodwill and trust during an actual occurrence. Disaster preparation ought to include the drafting of messages to be sent to the public in the event of natural disasters and security crises, which should also be pretested among citizens to measure their effectiveness relative to the preparation and onset phases of disaster. Pre-crisis planning strategies employed would potentially influence containment, recovery and evaluation phases.	High (CERQual adapted)
		Disaster efforts must **involve local level stakeholders** in response efforts, message dissemination, risk communication, and mitigation. Use alternative communication channels to increase community capacity and knowledge. Responders need to be proactive in building relationships with necessary stakeholders to galvanize local knowledge, particularly community engagement and cultural competence.	Moderate (GRADE adapted)
		Stable communication is key in the U.S. and E. Japan during disaster response. Consider alternative sources of communication to keep information flowing, particularly during the acute stage, but relative to all phases of disaster	Moderate (GRADE adapted)
		Educational campaigns and **health related information administered in the preparation and containment** phases is beneficial for populations in rural areas in China and France, who tend to be more vulnerable during disease outbreak disasters.	Moderate (CERQual adapated)
		Contingency plans ought to be **continuously evaluated** over the course of all phases of crises in order to plan for new occurrences that come up in the management of these events.	High (CERQual adapated)
		Establishing and maintaining collaborative relationships between disparate agencies such as health care providers, public health departments, and emergency responders in the U.S. and Algeria is key to effective crisis communication and planning during the preparation, onset, containment and recovery phases of general crises where the general population is concerned.	Moderate (CERQual adapted),

UNDESIRABLE RESPONSES, IMPACTS & EFFECTS		**Use multiple channels** to disseminate messages in Iran, Singapore, and Sweden particularly during the preparation and containment phases of disaster. When dealing with hurricanes, earthquakes, disease outbreaks and industrial accidents, response efforts should consider which channels are most appropriate for specific audiences during and after disaster. One study conducted in the U.S. recommended preparing messages in advance of the preparation phase.	Moderate(GRADE adapted)
		Grey literature Effective, strategic communication planning begins long before a crisis and involves a number of steps. A number of documents found that groundwork needs to be laid before an emergency. This includes creating a strategy and framework for communicating with all stakeholders, developing and vetting basic messages for issues likely to arise during a crisis, training communications personnel, and developing a system for rapid message review and approval Monitoring message effectiveness and adjusting them as necessary is important. Barrier analysis, comparing those who had adopted behaviour changes with those who had not, to help elucidate barriers to change, uncover perceived positive and negative consequences of behaviour changes, has been used fine tune messages accordingly (49). Social mobilizers can listen for misinformation and rumours, which can then be addressed swiftly (14, 21, 24). Two documents noted that the process of listening to the community, taking their concerns seriously and adapting messages accordingly should continue throughout the emergency	
	What happened that was undesirable? What did not seem to work? What were the undesirable wider impacts and consequences? What had a measurable undesirable effect? In what contexts and with whom?	**What did not work?** **Systematic review:** Commercial media (i.e., TV) does not function the same in every disaster situation, particularly flash floods and chemical disasters. In Iran and the U.S., using mass media to spread information may not be effective in environments where individuals rely more on familial and community connections than traditional news sources. Prior disaster experience can cause individuals after hurricanes and other natural disasters to perceive real threats as less serious.	Moderate (GRADE adapted) High CERQual adapted)
	How important are the undesirable anticipated		

	responses/impacts/effects? ○ Not important ○ Somewhat Important ○ Important ○ Very important ○ Varies ○ Don't know		
VALUES	Is there important uncertainty about or variability in how key stakeholders or people value and respond to the phenomena of interest/outcome? In what contexts and with whom? ○ Important uncertainty or variability ○ Possibly important uncertainty or variability ○ Probably no important uncertainty or variability ○ No important uncertainty or variability ○ Varies ○ Don't know		

RESOURCES REQUIRED	**How large are the resource requirements for the proposed option(s) (costs)?** ○ Large costs ○ Moderate costs ○ Negligible costs and savings ○ Moderate savings ○ Large savings ○ Varies ○ Don't know ○ Not applicable	According to the grey literature, effective, strategic communication planning begins long before a crisis and involves a number of steps. A number of documents found that groundwork needs to be laid before an emergency. This includes creating a strategy and framework for communicating with all stakeholders, developing and vetting basic messages for issues likely to arise during a crisis, training communications personnel, and developing a system for rapid message review and approval (4, 14, 18, 19, 52). Roles and responsibilities should be outlined and clearly defined (14, 52), and a network of communication partnerships should be created and maintained. A plan for working with the media should be developed (14, 18, 21, 52), as should a media toolkit (52). Adequate and timely funding should be secured (2). Other potential resources cited in the studies include: emergency response systems; communication networks/equipment and technology to manage communication systems; training of response personnel; education/training of community members relative to response prior to disaster; costs associated with bringing key personnel together to collaborate on response efforts. Most of these involve moderate costs, except where significant infrastructure changes might need to be made in order to accommodate new technology and equipment when traditional systems go down.	
EQUITY	**Does the evidence underpinning the option(s) consider health equity issues or particular contexts or subgroups?** ○ No ○ Yes ○ Varies ○ Don't know	**Strategic planning efforts must be contextualized for the diversity of populations** involved in disaster situations. This may involve learning more about regions with more vulnerable populations, expanding the knowledge base among response personnel regarding the characteristics of vulnerable populations and how their status impacts threat perception, risk perception, capacity to evacuate and potential for behavioral change. In order to reach these populations there is a greater need to coordinate response efforts with local stakeholders and disaster organizations and reconcile scientific expertise with local knowledge and prior firsthand experience. Requesting input from members of the public themselves and directly engaging with citizenry may help officials more thoroughly adapt crisis planning to the needs of those citizens, as well as better gauge the level of disaster knowledge already held by the public.	Moderate (GRADE): Moderate to High (GRADE Adapted) Moderate to High(CERQual) High (CERQual adapted)
ACCEPTABILITY	**Is the option(s) acceptable to key stakeholders?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies		

	○ Don't know		
FEASIBILITY	**Is the option(s) feasible to implement?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies ○ Don't know		

Potential options for recommendations/Best practices/important principles, implementation considerations

Emergency risk communication planning must be participatory, responsive to context and be a continuous process incorporating feedback from affected groups with a focus on preparedness, not just response

Implementation considerations:

- Planning functions best through collaboration among constituent groups. Health agencies, emergency systems, and other public services need to collaborate and establish communication networks in preparation for events.

- Communication planning must consider the communities, cultures, and lifestyles of different segments of the public and further, design disaster education and preparation around these social structures

- Involve multiple channels and means of communicating disaster messages
- Potentially affected communities must be involved at the planning stage.
- Planning should include establishment of mechanisms for monitoring and assessing effectiveness of messages and adjusting them as necessary

Summary of judgements

	JUDGEMENT								IMPLICATIONS
PRIORITY PROBLEM	No	Probably no	Probably yes	Yes		Varies	Don't know		
HOW IMPORTANT ARE THE DESIRABLE RESPONSES, IMPACTS & EFFECTS?	Not important	Somewhat important	Important	Very Important		Varies	Don't know		
HOW IMPORTANT ARE THE UNDESIRABLE RESPONSES, IMPACTS & EFFECTS?	Not important	Somewhat important	Important	Very Important		Varies	Don't know		
CERTAINTY/CONFIDENCE OF EVIDENCE BY EVIDENCE TYPE **ADD SEPARATE RATINGS FOR:** **GRADE** **ADAPTED GRADE**	 Very low Very Low	 Low Low	 Moderate Moderate	 High High			 No included studies No included studies		

	JUDGEMENT								IMPLICATIONS
CERQUAL **ADAPTED CERQUAL**	Very Low Very Low	Low Low	Moderate Moderate	High High			No included studies No included studies		
VALUES	Important uncertainty or variability	Possibly important uncertainty or variability	Probably no important uncertainty or variability	No important uncertainty or variability		Varies	Don't know		
RESOURCES REQUIRED	Large costs	Moderate costs	Negligible costs and savings	Moderate savings	Large savings	Varies	Don't know	N/A	
CERTAINTY OF EVIDENCE FOR REQUIRED RESOURCES	Very low	Low	Moderate	High			No included studies	N/A	
COST EFFECTIVENESS	Favours the comparison	Probably favours the comparison	Does not favour either the intervention or the comparison	Probably favours the intervention	Favours the intervention	Varies	No included studies	N/A	
DOES THE EVIDENCE CONSIDER EQUITY ISSUES?	No			Yes		Varies	Don't know		
ACCEPTABILITY OF THE OPTION(S)	No	Probably no	Probably yes	Yes		Varies	Don't know		
FEASIBILITY OF THE OPTION(S)	No	Probably no	Probably yes	Yes		Varies	Don't know		

Conclusions

Should

Emergency risk communication planning must be participatory, responsive to context and be a continuous process incorporating feedback from affected groups with a focus on preparedness, not just response

Implementation considerations:

- Planning functions best through collaboration among constituent groups. Health agencies, emergency systems, and other public services need to collaborate and establish communication networks in preparation for events.
- Communication planning must consider the communities, cultures, and lifestyles of different segments of the public and further, design disaster education and preparation around these social structures
- Involve multiple channels and means of communicating disaster messages
- Potentially affected communities must be involved at the planning stage.
- Planning should include establishment of mechanisms for monitoring and assessing effectiveness of messages and adjusting them as necessary

be recommended?

TYPE OF RECOMMENDATION	We recommend against the option(s) ○	We suggest considering the option(s): ○ Only in the context of rigorous evaluation ○ Only in specific contexts	We recommend the option(s) ○
RECOMMENDATION			
JUSTIFICATION			
SUBGROUP/EQUITY CONSIDERATIONS			
IMPLEMENTATION CONSIDERATIONS			
MONITORING AND EVALUATION			
RESEARCH PRIORITIES			

ANALYSIS

Question 8: What are the best ways and most appropriate tools for gathering, analysing, and interpreting emergency risk communication data and feedback and integrating results into emergency risk communication planning, strategy development, execution and evaluation?

Problem (phenomenon of interest): Methods and systems for collection, analysis, and application of emergency risk communication-related data

Setting: In the context of preparing for and responding to national and international events/emergencies with public health implications in high, low, middle income and fragile states. In the context of preparing for and responding to events/emergencies with public health implications in high, low, middle income and fragile states

Perspective: National governments and relevant subnational authorities (e.g., local/district health departments), responding and implementing partners, at-risk communities, stakeholders

Comparison (Foci to explore and compare): Between types of data and data gathering, community and audience feedback, message testing, public surveys, news and social media monitoring, rapid behavioural assessments, focus groups, key informant interviews, etc. Equity considerations such as local contextual and population characteristics.

Evaluation (What happened/ what worked/consequences/impact / how effective?): Impact on level of integration of results into emergency risk communication plans, strategies, and tactics; speed in modifying emergency risk communication messages and materials based on results; perceptions among concerned communities that health authorities are “listening”; speed of addressing rumours, impact on public trust in health protection information, perception among at-risk communities and stakeholders about relevance of response

Time: From 2003 onwards

Systematic Review Findings:

No evidence in English language journal articles of which tools worked best, but a list of tools used to gather data garnered from the literature and categorized by phase of response as below:

Preparation (Tools for exploratory and engagement purposes when developing ERC strategies)	**Response/Recovery** (Tools to assess and monitor the effectiveness of ERC strategies)
Focus Groups	Surveys
Interviews	Focus Groups
Surveys	Interviews
Participatory approaches	Media/social media monitoring
	Website monitoring
	Case studies

Evidence from Non-English Reviews

Summary of Chinese language findings for Microblog "Weibo," Chinese twitter (Chen, 2013; Zhang, 2015; Chen, 2014; Chen, 2015; Liu, 2013; The People's Public Opinion Monitoring Office and Weibo Data Center, 2012-2016) and 12320, the official Chinese public health hotline (Wang, 2010; Jiang, 2012), have been integrated into China's emergency response system as a critical and central risk communications tools by the Chinese government to **gather and monitor public opinions, disseminate information and evaluate government services and public communication efforts**. Working with Weibo's service provider, China's People's Public Opinion Monitoring Office and Weibo Data Center routinely publishes the Weibo Government Service Influence Index, the evaluation results on government service Weibo accounts, and develops training materials. Both tools are being used in routine day-to-day operations and during all type of emergencies, such as pandemic outbreaks, earthquakes, and major accidents.

Equity: Disparities were found in the development and performance of the government services Weibo and 12320. The Weibo Government Service Influence Index, jointly published by the China's People's Public Opinion Monitoring Office and Weibo service providers, Sina and Tencent, show that there is a strong association between the level of development of the regions/province, size of the population, and the government services' performance. Provinces such as Jiangsu, Shangdong, and Sichuan rank highly, whereas Hainan, Qinghai and Xizang are among the lowest ranked (People's Public Opinion Monitoring Office and Weibo Data Center, 2012-2016). A similar pattern is found in the development of 12320 among cities and provinces, where some cities and provinces are limited by capacity and resources to develop or expand the 12320 networks (Wang, 2010; Jiang, 2012).

Additional Grey Literature Review Findings:

Only three documents with potential relevance to this question were identified, two of high and one of moderate credibility. This low number of results seems appropriate, as two of the three sources concurred in expressing a paucity of evidence in this area.

Participants in one study expressed a lack of evidence about the effectiveness of different types of risk communication, as well as a lack of methodological frameworks and tools to evaluate risk communication. They further stated that having each country at a different level made comparative analysis difficult (13). Another report echoed these sentiments, noting that gaps and misalignments existed in the evidence, along with disagreement about what types of studies were acceptable. Even when studies were performed, the tendency was to focus on numbers of people reached, rather than on whether behaviour actually changed. Finally, funding for risk communication evaluation has diminished: apparently little demand for rigorous research exists (2).

Still, one document noted several aspects of risk communication that lend themselves to measurement: the time between threat perception and message release, the time between message release and public uptake, and the level of coordination with stakeholders and across units. Data could also be collected about how the message was delivered, received and acted on. Efficiency could be measured in terms of time saved, political pressure reduced and minimized media incidents. Effectiveness could be measured with KAP studies. These types of measurements should be taken before, during and after emergencies, to establish a baseline and to determine if messages need to be adjusted, as well as to evaluate overall performance (13).

Several study methods were presented as possibilities for evaluating risk communication programmes. According to one study, quasi-experimental research designs, interrupted time series analysis and studies that use statistical controls like propensity score matching to reduce the potential bias of confounding variables are being used more frequently, along with qualitative research. These represent best health communication evaluation (2). Other methods for evaluation include focus groups, interviews, KAP and other population surveys, opinion surveys and media/social media monitoring (13). With the Community Led Ebola Management and Eradication programme, revisits to communities were used to monitor, evaluate and adjust programs (63).

Potential option for recommendation/Best practices/principle/implementation considerations

A range of tools are used for data collection and analysis. Options include (see box).

Preparation (Tools for exploratory and engagement purposes when developing ERC strategies)	**Response/Recovery** (Tools to assess and monitor the effectiveness of ERC strategies)
Focus Groups	Surveys
Interviews	Focus Groups
Surveys	Interviews
Participatory approaches	Media/social media monitoring
	Website monitoring
	Case studies

Decision point: What are the Implementation considerations?

Assessment

	JUDGEMENT	RESEARCH & GREY EVIDENCE	CERTAINTY/CONFIDENCE IN THE EVIDENCE
PROBLEM	**Is the problem a priority?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies ○ Don't know		
DESIRABLE RESPONSES,&IMPACTS & EFFECTS	What happened that was desirable? What seemed to work? What were the desirable wider impacts and consequences? What had a measurable desirable effect? In what contexts and with whom? How important are the desirable anticipated responses/impacts/effects? ○ Not important ○ Somewhat Important ○ Important ○ Very important ○ Varies ○ Don't know		

UNDESIRABLE RESPONSES, IMPACTS & EFFECTS	What happened that was undesirable? What did not seem to work? What were the undesirable wider impacts and consequences? What had a measurable undesirable effect? In what contexts and with whom? How important are the undesirable anticipated responses/impacts/effects? ○ Not important ○ Somewhat Important ○ Important ○ Very important ○ Varies ○ Don't know		
VALUES	Is there important uncertainty about or variability in how key stakeholders or people value and respond to the phenomena of interest/outcome? In what contexts and with whom? ○ Important uncertainty or variability ○ Possibly important uncertainty or variability ○ Probably no important uncertainty or variability ○ No important uncertainty or variability ○ Varies ○ Don't know		
RESOURCES REQUIRED	**How large are the resource requirements for the proposed option(s) (costs)?** ○ Large costs ○ Moderate costs ○ Negligible costs and savings ○ Moderate savings ○ Large savings ○ Varies ○ Don't know ○ Not applicable		

CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES	**What is the certainty of the evidence of resource requirements for the proposed option(s) (costs)?** ○ Very low ○ Low ○ Moderate ○ High ○ No included studies ○ Not applicable		
EQUITY	**Does the evidence underpinning the option(s) consider health equity issues or particular contexts or subgroups?** ○ No ○ Yes ○ Varies ○ Don't know		
ACCEPTABILITY	**Is the option(s) acceptable to key stakeholders?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies ○ Don't know		
FEASIBILITY	**Is the option(s) feasible to implement?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies ○ Don't know		

Potential option for recommendation/Best practices/principle/implementation considerations

A range of tools are used for data collection and analysis. Options include (see box).

Preparation (Tools for exploratory and engagement purposes when developing ERC strategies)	**Response/Recovery** (Tools to assess and monitor the effectiveness of ERC strategies)
Focus Groups	Surveys
Interviews	Focus Groups
Surveys	Interviews
Participatory approaches	Media/social media monitoring
	Website monitoring
	Case studies

Summary of judgements

	JUDGEMENT								IMPLICATIONS
PRIORITY PROBLEM	No	Probably no	Probably yes	Yes		Varies	Don't know		
HOW IMPORTANT ARE THE DESIRABLE RESPONSES, IMPACTS & EFFECTS?	Not important	Somewhat important	Important	Very Important		Varies	Don't know		
HOW IMPORTANT ARE THE UNDESIRABLE RESPONSES, IMPACTS & EFFECTS?	Not important	Somewhat important	Important	Very Important		Varies	Don't know		
CERTAINTY/CONFIDENCE OF EVIDENCE BY EVIDENCE TYPE **ADD SEPARATE RATINGS FOR:** **GRADE** **ADAPTED GRADE** **CERQUAL** **ADAPTED CERQUAL**	Very low Very Low Very Low Very Low	Low Low Low Low	Moderate Moderate Moderate Moderate	High High High High			No included studies No included studies No included studies No included studies		
VALUES	Important uncertainty or variability	Possibly important uncertainty or variability	Probably no important uncertainty or variability	No important uncertainty or variability		Varies	Don't know		

	JUDGEMENT								IMPLICATIONS
RESOURCES REQUIRED	Large costs	Moderate costs	Negligible costs and savings	Moderate savings	Large savings	Varies	Don't know	N/A	
CERTAINTY OF EVIDENCE FOR REQUIRED RESOURCES	Very low	Low	Moderate	High			No included studies	N/A	
COST EFFECTIVENESS	Favours the comparison	Probably favours the comparison	Does not favour either the intervention or the comparison	Probably favours the intervention	Favours the intervention	Varies	No included studies	N/A	
DOES THE EVIDENCE CONSIDER EQUITY ISSUES?	No			Yes		Varies	Don't know		
ACCEPTABILITY OF THE OPTION(S)	No	Probably no	Probably yes	Yes		Varies	Don't know		
FEASIBILITY OF THE OPTION(S)	No	Probably no	Probably yes	Yes		Varies	Don't know		

Conclusions

Should a best practice option be recommended?

A range of tools are used for data collection and analysis. Options include (see box).

Preparation (Tools for exploratory and engagement purposes when developing ERC strategies)	**Response/Recovery** (Tools to assess and monitor the effectiveness of ERC strategies)
Focus Groups	Surveys
Interviews	Focus Groups
Surveys	Interviews
Participatory approaches	Media/social media monitoring
	Website monitoring
	Case studies

TYPE OF RECOMMENDATION	We recommend against the option(s) ○	We suggest considering the option(s): ○ Only in the context of rigorous evaluation ○ Only in specific contexts	We recommend the option(s) ○
RECOMMENDATION			
JUSTIFICATION			
SUBGROUP/EQUITY CONSIDERATIONS			
IMPLEMENTATION CONSIDERATIONS			
MONITORING AND EVALUATION			
RESEARCH PRIORITIES			

Question 9: What are the best ways to engage communities in emergency risk communication activities to respond to events/contexts?

Problem: (phenomenon of interest): Strategies and tactics for encouraging participation of at-risk communities in emergency risk communication planning and response

Setting: In the context of preparing for and responding to national and international events/emergencies with public health implications in high, low, middle income and fragile states

Perspective: National governments and relevant subnational authorities (e.g., local/district health departments), responding and implementing partners, at-risk communities and stakeholders

Comparison (Foci to explore and compare): Differing tactics: integration of at-risk communities into planning processes, providing incentives to community leadership, use of formal reporting systems and feedback loops, others . Equity considerations such as local contextual and population characteristics.

Evaluation: (**What happened/ what worked/consequences/impact / how effective?**): Impact on level of engagement and retention of community participation, public trust in health protection information, level of coverage of information sharing, perceived relevance among communities of national response to local questions/concerns

Time: 2003 to present

Systematic Review Findings:

There is conflation of the terms “participation,” “engagement” and “outreach”, which complicated the synthesis. Likewise, there is a similar problem with conflation of the terms “communities-at-large,” “community sectors,” and “household/individuals” for communities. Research supports phenomena of interest in principle and with some best practices; however, recommendations for strategies and tactics are not supported. Another problematic that affects evidence synthesis and the designation of direct, indirect, partial, and unclear relevancy is the definitions and intersections of the terms “planning,” and “preparedness” and the phases of a crisis.

The studies on public health emergency events focus on countries distributed throughout the world, which widen the geographical scope. The studies also focus on multiple configurations of phases, although the preparedness phase predominates.

Studies rarely directly studied which strategies or tactics are most effective for engaging community participation. Sometimes studied was the importance of community participation in meetings of varied purpose in relation to public health emergency events. Such meeting purposes included: a) planning design and development; b) information dissemination; c) training on roles, responsibilities, tasks; d) conducting preparedness actions; and e) relationship building/bonding. In addition to engagement as attendees, it may also be important to be a planning member of activities/ meetings. Of note, training on the roles and responsibilities appears to beneficially include factors of community level, local context, and past experience, which not only aids in cooperation and collaboration but may address the issue of risk paradox tied to perception and experience. Relationship building and bonding not only serves to create trust and confidence in leaders, it also serves to create social connectedness and networks. There is some clear indication that activities prior to an event will more successfully engage communities than those only attempted during an evolving event.

The present review in comparison to the existing ones reveals an increased scope in relation to the geographical countries of disaster/ emergency onset.

Gaps in existing research:

The most apparent gap identified in the reviewed literature is the paucity of studies fully related to the phenomenon of interest, which is the effective ways to engage communities in planning activities and activities for preparedness and response actions. This applies to activities before, during, and after disaster/ emergency events. The paucity of studies becomes even more problematic if recommendations would differ for different community levels, communities-at-large, community sectors, and community individuals/ households.

In addition, the strategies and tactics that may work for planning activities may differ for preparedness and response-related activities. The absence of such distinctions in the literature reveals gaps that require separate attention. Although disasters/ emergency events always happen locally, there is the possibility of activities that engage communities at the state, regional, national, and international level. No study examined how communities (in its many definitions) could play a role in activities conducted at the more distant level.

Grey Literature Review Findings:

Overwhelmingly the grey literature found that engaging communities should play a central role in emergency responses. Not only is community engagement key to building trust, but as one report noted, local efforts also played the most important role in turning the Ebola tide, because the turning point was reached before the full-blown response was operational (53). It is fitting, then, that more documents were found relating to this question than to any other.

Sixty-eight documents were identified as contributing to this question, thirty from high credibility sources, 36 from moderate and 2 from low. The two low credibility sources were retained, as they represented opinions of those working on the frontlines of the Ebola outbreak, and as such were considered worth noting, even if they were not well documented. Lessons gleaned from these materials fell into two categories: Things which improve community engagement, and barriers to community engagement. Each are addressed below.

Things which improve community engagement

The grey literature examined in this quick review found a number of methods which improve community engagement, thirteen of the most common of which are listed in Table 6.1 Community Engagement Methods, below. In the table, each engagement method is followed by the number of documents which mentioned this method as improving engagement success. Essentially, these lessons learned could be summarized in two words: Go local. The literature found that communities responded best when as much as possible was done locally – involving local people, respecting local culture, language and circumstances, and listening to local concerns and opinions; all this on an on-going basis.

Table 6.1 Community Engagement Methods (by number of documents*)

Engagement Method	Total Documents
Engage local leadership and key people	31
Tailor interventions for population, gender, circumstances, language	26
Use locals as mobilisers	16

Community creates own interventions	15
Engage local groups	15
Listening & 2-way communication	15
Use local media	12
On-going monitoring & evaluation (feedback)	11
Use anthropological assessments	10
Start communication early	8
Use visual aids, role plays & story telling	6
Community conducts own outbreak analysis	3
Decisions made at local level	3

*Sources provided in Appendix 5.

Involving local leadership was listed by 31 documents as an important step toward community engagement. Using local people as mobilisers and engaging local groups were also seen as important, with 16 and 15 documents respectively mentioning this as helping gain access to communities and to successful uptake of behaviour changes. Further detail about who these people and groups are is provided in Table 6.2 People and Groups to Engage, below.

Table 6.2 People and Groups to Engage*

People to Involve	Total Documents
Religious leaders	18
Traditional leaders, chiefs, elders	16

Other local authorities or leaders	11
Women & Women's groups	11
Health Workers	10
Youth groups	9
Traditional healers	7
Others (hunters, taxis, market groups, hospitality industry)	5
Survivors	4

*Sources provided in Appendix 6.

The group of people listed most as important to involve were religious leaders (18 documents), followed by traditional leaders, other local authorities or leaders, and women or women's groups. Targeting women particularly, not only for epidemic response efforts, but for health improvement in general, has proven very effective (64, 65). One report stated that engaging women is critical to changing behaviour. It likened Ebola to a fire and women to water, noting that water puts out the fire (66). Health workers, youth groups, traditional healers and other groups, such as hunters, taxi drivers, market groups and those involved with hospitality businesses (restaurants, bars, hotels) were also found to be important inroads into communities. Using locals as mobilizers also proved affective, although Quinn emphasized that locals should be selected based on their understanding of local culture and for being trusted by the local community (12).

Tailoring interventions for gender, language, local cultural nuances and circumstances has also proven effective, ideally with communities assessing the situation themselves and crafting their own messages, with regular monitoring and feedback to allow for further adjustments.

This makes sense, because as a general rule, most people prefer to have a choice in what they do. Since communities are conglomerates of people, not surprisingly this holds true for them too. A number of sources noted that response efforts were most effective when they were owned and driven by local communities and local leadership (3, 28, 35, 54, 67, 68). Another report also emphasized this, along with the importance of participatory decision making and focusing on the strengths of local populations (53). Communities need to be allowed to differ from each other (28) and compassion should be communicated. People's fears and concerns need to be acknowledged, and a sense of self-efficacy conveyed (3, 18, 21, 36, 56).

Community engagement in emergency risk communication should start long before an emergency occurs. Connection with community entities should be established and relationships of trust developed before a crisis, so that these networks of Ailles may be activated should an emergency occur (18, 21, 55). The importance of building on these existing relationships was noted in several documents (20, 55, 69). Two others expanded this to include recognizing and building on local organization (60, 70). The public should also be considered an ally to partner with (18, 21).

As far as specific forms of engagement were concerned, radio was identified as a particularly effective means of accessing communities (42) (20, 41, 43, 71), although De Roeck notes that if specific, limited groups are the target audience, broadcast media may not be the best choice for communication (24). House-to-house visits (35, 41, 43, 69, 72-74) and religious gatherings (43) were also found to be effective. Some reports found that door-to-door visits worked best, followed by the use of drama and dance (73, 74).

Another form of community engagement that has proven effective, especially in value-laden situations of an educational nature and where guidelines are being provided, is public deliberation. This involves recruiting an inclusive selection of community representatives, presenting the expert evidence and guidelines to them, then facilitating discussion and making decisions in a participatory manner (75).

How safety measures are implemented also effects their uptake. Richards noted that rural communities regret these measures (curtailing traditional handshaking and burial rituals), but they understood and were willing to comply, although they would prefer to be trained to do safe burials themselves (76), or at least have their traditions respected as much as safety protocols would permit (46).

Miller noted that attention must be paid to political realities, both historic and current (7). Political realities shape the landscape of relations between power structures and communities, including issues of mistrust. Community engagement efforts must bear this in mind or engagement efforts will be frustrated. Involvement of trusted local leaders is imperative (7, 36). Transparency is also important (77).

One report also listed school-based programmes as an effective engagement strategy (78).

Barriers to community engagement

The grey literature identified several barriers to community engagement. DuBois noted that top-down communication, stereotyping and paternalism broke down trust, created fear and alienated communities whose support was critical to a successful response (62). Use of force or trying to force change was also counter-productive (48, 69, 73, 74).

Another barrier to successful community engagement and uptake of prevention messages was the failure to distinguish evidence-based messages (avoid contact with bodily fluids of infected and dead) from uncertain messages (eating bush meat). This was compounded by the apparent unwillingness of those issuing health messages to admit and explain their errors. Richards cited the initial ban on bush meat consumption to illustrate this, noting that the later change of this message was not explained, nor error admitted (46). Lack of message coordination further confused the issue (36).

It may also be possible that not all community engagement efforts are equally engaging or community led. Gautier noted that despite engagement with local leaders, shaking hands and respecting safe burial practices remained a challenge (73, 74). One could question whether this was due to the intervention still being top-down in that training was provided to community health workers and local leaders, rather than allowing the community to conduct its own assessment and devise their own solutions and protection measures. One report noted that the age (young) of the sensitizers may have negatively impacted the uptake of messages (74). It is unclear whether initial training was provided to both community health workers and local leaders together, or if training was provided primarily to (young) community health workers (CHWs), and only through them to community leaders. If the latter, this could have represented a continued failure to acknowledge, respect and work with local leadership.

Barriers to successful engagement and uptake of prevention measures may find their root in a quite different source. Both Gautier reports noted that lack of resources (gloves, boots, financing) hindered implementation of safe burial practices. Both state that more focus should have been placed on the practicalities of implementation (73, 74). Oxfam also noted the need for sanitation supplies, such as bleach, gloves, and boots (79), and Y Care noted that lack of funding impeded early response (41). These reports highlight that the success of behaviour change communication can be confounded by lack of resources. This does not necessarily mean the communication has been ineffective.

The less-settled ways of urban areas can make community engagement more difficult than in rural communities. One report noted that the absence of traditional community structures and organizations in urban areas made the work there more challenging (53). Richards fine-tuned this observation, noting that in rural communities, villagers had "face-to-face social knowledge" of Ebola – they could name everyone who has died or survived and trace the pattern. This and villagers "mutual accountability" helped them understand the necessity of safe practices in regard to the sick and dead. This knowledge and accountability are absent in urban areas where all are "strangers" (76).

Finally, the tone of communication with communities also mattered. When health workers "talked down" to community members, community members did not wish to interact with them and therefore avoided them and the health care facilities. Use of respectful speech by health workers and providing tours of health care facilities helped reduce fear and enabled improved engagement with communities (51). Other reports also emphasized the importance of treating people respectfully (55, 58, 68). This respect should include respect for their opinions (2).

Potential options emerging for recommendation(s)/best practice(s)/ overarching principle (s) implementation consideration (s)

Involve local leadership to ensure interventions are culturally appropriate.

Provide access to material resources and technologies that enable communities to prepare and respond to emergencies and learn from past events.

Assessment

	JUDGEMENT	RESEARCH & GREY EVIDENCE	ASSESSMENT OF CERTAINTY/CONFIDENCE IN THE EVIDENCE (ASSESSMENT TOOL)
PROBLEM	**Is the problem a priority?** ○ No ○ Probably no ○ Probably yes Yes ○ Varies ○ Don't know	Review findings: **Grey literature:** Overwhelmingly the grey literature found that engaging communities should play a central role in emergency responses. Not only is community engagement key to building trust, but as one report noted, local efforts also played the most important role in turning the Ebola tide, because the turning point was reached before the full-blown response was operational (53). It is fitting, then, that more documents were found relating to this question than to any other.	

DESIRABLE RESPONSES,&IMPACTS & EFFECTS	What happened that was desirable? What seemed to work? What were the desirable wider impacts and consequences? What had a measurable desirable effect? In what contexts and with whom? How important are the desirable anticipated responses/impacts/effects? ○ Not important ○ Somewhat Important ○ Important ○ Very important ○ Varies ○ Don't know	Meetings prior to an emergency event appear to be more effective than meetings during an emergency event. A community intervention for flash flood preparedness using village disaster taskforces and family training in randomly selected intervention and control villages in Iran showed statistically significant improvement on all outcome measures of preparedness in the intervention villages relative to the control villages. A community educational intervention using primary health care workers in Iran covering awareness and preparedness regarding earthquakes and floods. The study was conducted in a randomly selected intervention and control region and had a pre-post design. Pre- to post-intervention change in scores on disaster awareness and preparedness showed statistically significant greater improvement in the intervention households compared to the control households. An intervention for enhancing disaster preparedness using a randomized longitudinal cohort design with two experimental conditions, community health worker led discussion groups along with mailed information versus mailed information only, found that mailed information was equally sufficient to encourage households to obtain disaster supplies but the interpersonal education condition led to statistically significant higher adoption of complex disaster planning. An intervention for enhancing disaster preparedness using randomized block design with two experimental conditions, community health worker led discussion groups versus culturally tailored mailed information only, showed that both conditions improved purchase of disaster supplies and creation of a communication plan, but the discussion group condition showed statistically significant greater improvement than the mailed information condition. <u>Clear and consistent messages with framing specific to targeted publics increased participation</u> in activities and event actions for preparedness/response actions (as studied for general disasters among Latinos in the U.S. and in a community intervention that tested an SMS system for use in preparation, onset, and containment phases of an EID in Taiwan)In an outbreak of	Moderate (21 studies, all 4 tools used) Moderate(GRADE) Moderate (GRADE) Low(GRADE)

		acute haemorrhagic conjunctivitis (AHC) infectious disease in Taiwan, the study compared the cities of Taipei, which received an integrated risk communication programme that included short messaging service (SMS) messages sent to all citizens with mobile phones, and Keelung, which did not receive such a program. The analysis showed that Taipei had a statistically significant shorter epidemic duration (13 vs. 34 days) and attack rate (5 vs. 14 days). When leaders, with formal responsibilities related to emergencies, include community individuals (as planners and attendees) in pre-event activities for 1) plan/s development, 2) information/education dissemination, 3) training on who is responsible for what and what to do, 4) conducting preparedness actions, and 5) relationship bonding/building, there are increases in preparedness and response actions. This applies to individual/household and community level actions. Kingdom of Morocco (2005) study focused especially on low SES. Post-event screenings, such as those for PTSD after an earthquake in Japan, can help to connect individuals to services. Consistent messages (not repetitive use of same message) disseminated many times and through a myriad of media channels usually empowers community individuals by increasing knowledge and preparedness/response actions. Targeting and attending to message framing for differing audiences usually makes a difference on awareness, knowledge acquisition, and action. Risk communication has a large effect on individual response actions, especially among prevention-focused people. Including community individuals in pre-event development and outreach efforts helps with engagement in activities for preparedness/response actions. One study (Falconi, 2012) specially addressed the needs of individuals with functional limitations. Two studies (Gondard-Delacroix, 2004; Tamru, 2002) looked at low SES. Access to material resources and technologies impact infrastructure/capacity of communities-at-large for preparedness, knowledge and activities of individuals for preparedness and response, and innovation and learning from past events.	Moderate (GRADE)
UNDESIRABLE RESPONSES, IMPACTS & EFFECTS			Moderate(GRADE adapted) Moderate (GRADE adapted)

	What happened that was undesirable? What did not seem to work? What were the undesirable wider impacts and consequences? What had a measurable undesirable effect? In what contexts and with whom? How important are the undesirable anticipated responses/impacts/effects? ○ Not important ○ Somewhat Important ○ Important ○ Very important ○ Varies Don't know	Grey literature: DuBois noted that top-down communication, stereotyping and paternalism broke down trust, created fear and alienated communities whose support was critical to a successful response (62). Use of force or trying to force change was also counter-productive (48, 69, 73, 74). Failure to distinguish evidence-based messages (avoid contact with bodily fluids of infected and dead) from uncertain messages (eating bush meat): this was compounded by the apparent unwillingness of those issuing health messages to admit and explain their errors. Not all community engagement efforts are equally engaging or community led. Gautier noted that despite engagement with local leaders, shaking hands and respecting safe burial practices remained a challenge (73, 74). One could question whether this was due to the intervention still being top-down in that training was provided to community health workers and local leaders, rather than allowing the community to conduct its own assessment and devise their own solutions and protection measures. The age (young) of those delivering messages may have negatively impacted the uptake of messages (74). It is unclear whether initial training was provided to both community health workers and local leaders together, or if training was provided primarily to (young) community health workers (CHWs), and only through them to community leaders. If the latter, this could have represented a continued failure to acknowledge, respect and work with local leadership. Barriers to successful engagement and uptake of prevention measures may find their root in a quite different source. Both Gautier reports noted that lack of resources (gloves, boots, financing) hindered implementation of safe burial practices. Both state that more focus should have been placed on the practicalities of implementation (73, 74). Oxfam also noted the need for sanitation supplies, such as bleach, gloves, and boots (79), and Y Care noted that lack of funding impeded early response (41). These reports highlight that the success of behaviour change communication can be confounded by lack of resources. This does not necessarily mean the communication has been ineffective.	Moderate (CERQUAL) Moderate-Low (CERQUAL) Moderate (MM/CS)

VALUES	Is there important uncertainty about or variability in how key stakeholders or people value and respond to the phenomena of interest/outcome? In what contexts and with whom? Important uncertainty or variability ○ Possibly important uncertainty or variability ○ Probably no important uncertainty or variability ○ No important uncertainty or variability ○ Varies ○ Don't know	Local contexts and culture are very important to consider for disaster preparedness and response. Some local contexts included local traditions, class, children, gender, immigrants, disabled, and rural geographical areas. Risk perception, throughout the phases of an emergency event but especially during the preparation phase, depends on socio-demographic variables (personal, social, economic) and experience.	Moderate (CERQual adapted)
RESOURCES REQUIRED	**How large are the resource requirements for the proposed option(s) (costs)?** ○ Large costs ○ Moderate costs ○ Negligible costs and savings ○ Moderate savings ○ Large savings ○ Varies Don't know ○ Not applicable		

CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES	**What is the certainty of the evidence of resource requirements for the proposed option(s) (costs)?** Very low ○ Low ○ Moderate ○ High ○ No included studies ○ Not applicable	Resources for institutional innovation/learning and infrastructure/capacity will best prepare communities for events. Access to resources, such as social media before and during floods in Australia, and evacuation vehicles, such as motorbikes during volcano-induced evacuation in Indonesia, can affect knowledge of and participation in activities for preparedness/response and real-time response actions. Grey lit: The success of behaviour change communication can be confounded by lack of resources.	Low (CERQual) Moderate (CERQual adapted)
EQUITY	**Does the evidence underpinning the option(s) consider health equity issues or particular contexts or subgroups?** ○ No ○ Yes Varies ○ Don't know		
ACCEPTABILITY	**Is the option(s) acceptable to key stakeholders?** ○ No ○ Probably no ○ Probably yes ○ Yes		

	Varies ○ Don't know		
FEASIBILITY	**Is the option(s) feasible to implement?** ○ No ○ Probably no Probably yes ○ Yes ○ Varies ○ Don't know		

Summary of judgements

	JUDGEMENT								IMPLICATIONS
PRIORITY PROBLEM	No	Probably no	Probably yes	Yes		Varies	Don't know		
HOW IMPORTANT ARE THE DESIRABLE RESPONSES, IMPACTS & EFFECTS?	Not important	Somewhat important	Important	Very Important		Varies	Don't know		

	JUDGEMENT								IMPLICATIONS
HOW IMPORTANT ARE THE UNDESIRABLE RESPONSES, IMPACTS & EFFECTS?	Not important	Somewhat important	Important	Very Important		Varies	Don't know		
CERTAINTY/CONFIDENCE OF EVIDENCE BY EVIDENCE TYPE **ADD SEPARATE RATINGS FOR:** **GRADE** **ADAPTED GRADE** **CERQUAL** **ADAPTED CERQUAL**	Very Low Very Low Very Low Very Low	Low Low Low Low	Moderate Moderate Moderate Moderate	High High High High			No included studies No included studies No included studies No included studies		
VALUES	Important uncertainty or variability	Possibly important uncertainty or variability	Probably no important uncertainty or variability	No important uncertainty or variability		Varies	Don't know		
RESOURCES REQUIRED	Large costs	Moderate costs	Negligible costs and savings	Moderate savings	Large savings	Varies	Don't know	N/A	

	JUDGEMENT								IMPLICATIONS
CERTAINTY OF EVIDENCE FOR REQUIRED RESOURCES	Very low	Low	Moderate	High			No included studies	N/A	
COST EFFECTIVENESS	Favours the comparison	Probably favours the comparison	Does not favour either the intervention or the comparison	Probably favours the intervention	Favours the intervention	Varies	No included studies	N/A	
DOES THE EVIDENCE CONSIDER EQUITY ISSUES?	No			Yes		Varies	Don't know		
ACCEPTABILITY OF THE OPTION(S)	No	Probably no	Probably yes	Yes		Varies	Don't know		
FEASIBILITY OF THE OPTION(S)	No	Probably no	Probably yes	Yes		Varies	Don't know		

Conclusions:

Should:

- **Involve local leadership to ensure interventions are culturally appropriate.**
- **Provide access to material resources and technologies that enable communities to prepare and respond to emergencies and learn from past events.**

Be adopted as a recommendation?

TYPE OF RECOMMENDATION	We recommend against the option(s) ○	We suggest considering the option(s): ○ Only in the context of rigorous evaluation ○ Only in specific contexts	We recommend the option(s) ○
RECOMMENDATION			
JUSTIFICATION			
SUBGROUP/EQUITY CONSIDERATIONS			
IMPLEMENTATION CONSIDERATIONS			
MONITORING AND EVALUATION			
RESEARCH PRIORITIES			

SOCIAL MEDIA

Question 10: What are the best social media channels and practices to promote health protection measures and dispel rumours and misinformation during events and emergencies with public health implications?

Problem: (phenomenon of interest): Ability of different social media channels and practices to promote health protection information and dispel rumours and misinformation: extent of reach, level of influence, outcomes, types of audiences

Setting: In the context of preparing for and responding to national and international events/emergencies with public health implications in high, low, middle income and fragile states

Perspective: National governments and relevant subnational authorities (e.g., local/district health departments), responding and implementing partners; at-risk communities and stakeholders

Comparison (Foci to explore and compare): Source of social media messages (health authorities, community leaders, celebrities, NGOs, etc.); types of social media (SMS, Twitter, Facebook, etc.). Equity considerations such as local contextual and population characteristics.

Evaluation: (**What happened/ what worked/consequences/impact / how effective?**): Impact on public trust in health protection information, level of coverage of information sharing, unanticipated negative consequences, distortion of health protection messages/information, impact on community engagement

Time: 2003 onward

Systematic Review Findings:

Most studies were situated in the United States, Western and Eastern developed regions and countries such as Japan, China, Australia and Europe. Earthquakes, typhoons, infectious diseases and floods were studied most often. Most studies analyzed the use of social media during the containment phase or the containment phase in combination with preparation, onset and/or recovery phases. Most studies focused on the general population or health agency officials; only a small minority revealed sample demographics with a focus on vulnerable groups.

Social media, especially Twitter and Facebook, can be used to spread truthful information and to verify information to dispel rumours and misinformation during public health crises. This is especially important regarding alternative social media not immediately controlled by the government in countries where people are distrustful of official government messages and campaigns and turn to peers online to find more and accurate information. Studies demonstrated that the vast majority of messages on social media, especially Twitter and Facebook, were verified via self-regulation by users on the platforms as well as by agencies, which actively used myth-busting messages to address rumours and spread truthful information. This means, that while peer monitoring and correcting kept social media messages largely accurate, it was still recommended that governmental agencies and implementing partners train, employ, and pay a dedicated social media officer to build relationships with at-risk communities and stakeholders and to use social media consistently to build trust and credibility and to address rumours and misinformation as soon as they arise. The use of hashtags was found to be helpful in cases of myth-busting as has been shown in a row of studies based in Australia during a flood where the social media accounts by local police were celebrated for their prompt myth-busting and reliability to provide consistent, timely updates with accurate information. Governmental agencies should use hashtags that have organically developed on social media, are already used by the majority of the public, and are in wide circulation, rather than creating and insisting on others using “their” newly branded hashtags for an event.

In contrast to the existing reviews, of which only one directly focused on social media use in health messages and which noted the dearth of studies on social media in risk communication, the present review drew on a large number of studies. In contrast to the previous reviews, it emerged in the present review that most studies on social media in risk communication have focused on posts on Twitter (and its equivalent of Sina Weibo in China), called tweets, and Facebook by the public and government agencies; a minority of studies focused on other social media sites such as Flickr, SMS, blogs, YouTube and mapping apps.

Regarding Twitter, studies were mostly interested in the content of messages, including hashtags, re-tweeted material, sources of the message, and links. These features in turn were often discussed to gauge the credibility and verifiability of social media content, including trust in different types of sources (e.g. governmental, user-generated or news media).

Gaps in the research

Research gaps appeared regarding the phases of a disaster as few studies focused on the use of social media during the recovery and preparation phases. Geographically, Africa, Central and South America, South-East Asia, Central Asia, and the Indian Subcontinent as well as Eastern Europe have remained vastly understudied. Within the regions and countries where social media were studied, the vast majority of studies did not analyze the demographics of the social media users beyond their geographic location, their status of being in the disaster zone or outside this zone, and their frequency and content of posting. Socio-economic demographics were not collected and/ or analyzed to drill deeper into the implications of using social media to reach vulnerable populations. Who exactly is reached via social media campaigns and who needs to be reached with other means have remained an understudied areas; social media's impact as one part of a multi-modal communication strategy similarly remains relatively understudied. Studies point toward information overload and confusion that can arise from social media use during crises events; however, how people can use social media well and can balance online information seeking with offline information seeking measures remains little understood.

Grey Literature Review Findings:

The grey literature covered in this rapid review offered little information about the best social media channels and practices for risk communication. Of the 20 documents included as potentially relevant, only two (2, 80) provided numbers, and even these numbers did not really indicate effectiveness. Other documents described uses of social media, but judging their effectiveness was difficult (81), as they took place in the context of a number of other simultaneous interventions. What these documents can do, is point the direction, showing what these new media forms may be able to do. Of the documents reviewed, two were from low credibility sources, eight from moderate and 10 from high.

That social media is being used is an accepted reality. During the Ebola outbreak, MSF's online and social media saw an upswing of use, as did their blogs and Facebook pages (17). WhatsApp showed use around Freetown in Sierra Leone (82). In New York City, social media was used to counter rumours when Dr. Craig Spencer tested positive for Ebola (83), and one study found that 87% of doctors in Brazil 87% use WhatsApp to communicate with patients, one of the highest rates of such use in the world (80). In West Africa, chat apps, especially WhatsApp, were considered better than SMS because they were cheaper. WhatsApp also proved useful in tracking rumours(36). Other new useful media tools included RapidPro and SMS systems (65). It was also found that social media is being used increasingly to monitor what the public is saying about public health issues (13).

SMS or text messaging was used successfully to track and combat rumours and to communicate with quarantined areas during the Ebola outbreak (21, 42, 43). In addition, a collaborative effort between BBC and WhatsApp enabled messages from WHO, UNICEF and the CDC to be channelled directly to 20 thousand subscribers, most of whom were in West Africa. The Sierra Leonean version of this channel had 15 thousand subscribers by the end of the outbreak (2). SMS was also used for real-time monitoring (84). Nigeria used mobile phones to disseminate Ebola messages (26), and the government of Sierra Leone chose WhatsApp as one of its official response channels (81).

One innovative feature of social media use during the West African Ebola outbreak was the way it enabled the Sierra Leonean diaspora to play a role in in-country social mobilization. Sierra Leoneans living abroad used Skype, Facebook and WhatsApp plus their in-country connections' smart-phone-enabled Internet access to share information about the outbreak. Facebook discussion groups were also created and used. Although at least initially, some members of the diaspora circulated rumours

over social media, some also did their best to communicate accurate messages. Later on, members of the diaspora who were in health professions used social media to mobilize their in-country family, professional, business and political connections (81).

The communication potential of social media was perhaps best illustrated by Brazil, where phone use has overtaken television as the main form of media consumption. For good or ill, traditional media and social media are now equal partners in Brazil's media world (80).

But the news about social media was not all positive. One report listed social media as a source of Zika-related rumours, as well as a place for ministries of health and other public health bodies to post messages (16). This was also true for Ebola (81). And social media's apparent success in urban Sierra Leone should be balanced against the observation that most mobile phone use was concentrated in larger urban areas. Rural areas remained relatively isolated from social media's effects (81).

In addition, documents found that social media suffers from a credibility issue. Although in the United States, most people received Zika information via TV, radio, social media and blogs, the CDC and family doctors were considered the most credible sources (29).

Another challenge posed by social media was the difficulty in controlling messages. Once on the loose in cyberspace, video clips or other messages took on cyclical lives of their own, peaking, dying down, then resurfacing. This held true for rumours as well as official messages (80). Nor did social media necessarily represent the best solution. One study found that people who used conventional media or government sources for their health information were more likely to be knowledgeable about Zika than were those who relied on friends, family or social media for health information (85). Another stated that despite the current trend of wanting technology to provide nearly magical solutions to problems, Ebola was a problem that was solved by "brute force", meaning the physical labour of sanitation work and the human contact of social mobilization. It found that, "No form of engagement was more effective than face-to-face discussion, and there are no technological short-cuts for safe burial and body management. This was not a crisis solved by new technologies and innovations, but by an enormous amount of human and other resources" (69).

These detractors, rather than showing that social media should not be pursued, serve instead as a reminder that conventional media still plays a dominant role in most health communication situations. One report expressed this well, advising that the concept of media be expanded to include social media (18). When it comes to getting messages out, both conventional and social media should be used, rather than just one or the other.

Potential options emerging for recommendation(s)/best practice(s)/ overarching principle (s) implementation consideration (s)

Social media, should be used to monitor public reactions during a crisis, to address the public, create situational awareness, for citizens' peer-to-peer communication and aid, and to solicit responses from the ground

Social media should be used together with traditional news media as part of an integrated communication strategy to spread verified information

Government agencies and implementing partners need to train, employ and pay dedicated social media officers to build relationships with stakeholders and to use social media consistently to build trust and credibility before, during and after emergencies

Assessment

	JUDGEMENT	RESEARCH & GREY EVIDENCE	ASSESSMENT OF CERTAINTY/CONFIDENCE IN THE EVIDENCE (ASSESSMENT TOOL)
PROBLEM	**Is the problem a priority?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies ○ Don't know	Review findings: Grey literature That social media is being used is an accepted reality. During the Ebola outbreak, MSF's online and social media saw an upswing of use, as did their blogs and Facebook pages (17). WhatsApp showed use around Freetown in Sierra Leone (82). In New York City, social media was used to counter rumours when Dr. Craig Spencer tested positive for Ebola (83), and one study found that 87% of doctors in Brazil 87% use WhatsApp to communicate with patients, one of the highest rates of such use in the world (80). In West Africa, chat apps, especially WhatsApp, were considered better than SMS because they were cheaper. WhatsApp also proved useful in tracking rumours(36). Other new useful media tools included RapidPro and SMS systems (65). It was also found that social media is being used increasingly to monitor what the public is saying about public health issues (13).	

& EFFECTS	What happened that was desirable? What seemed to work? What were the desirable wider impacts and consequences? What had a measurable desirable effect? In what contexts and with whom? How important are the desirable anticipated responses/impacts/effects? ○ Not important ○ Somewhat Important ○ Important ○ Very important ○ Varies ○ Don't know	Research Evidence **Social media, especially Twitter and Facebook, should be used by agencies, first responders and the public to monitor public reactions during a crisis, to address the public, create situational awareness, for citizens' peer-to-peer communication and aid, and to solicit responses from the ground;** this is especially true of those who are directly affected by a disaster (also during different phases of disaster). These findings were also based on studies analyzing mostly containment but some also preparation and recovery phases. (70 studies). Social media, especially Twitter (Weibo) and Facebook, need to **be incorporated into daily operations of governmental agencies** and implementing partners during preparation phases before disaster such as emergencies of any kind, tornadoes, and tsunamis, strike to build familiarity, routine, and networks to use social media during onset and containment phases. This was also the case for local government officials, university administrators, media, and police in the US during the preparation, onset, containment and recovery phases of different disasters, including fires and hurricanes; city officials during the onset and containment of a flood in Germany; and the preparation phase of an H1N1 outbreak in China. (12 studies). **Social media should be used together with traditional news media** for an integrated communication strategy to spread verified information as traditional news media enjoy high credibility. Governmental agencies and implementing partners need to **train, employ and pay dedicated social media officers** to build relationships with stakeholders and to use social media consistently to build trust and credibility during the onset and containment phases (12 studies) **Messages on social media**, especially Twitter and Facebook, are verified via self-regulation by users on the platforms as well as by agencies, which actively use myth-busting messages during the onset and containment phases Studies point toward the information overload and confusion that can arise from social media use during crises events; however, how people can use social media well and can balance online information seeking with offline information seeking measures remains little understood. Few studies used comparative approaches between different countries or regions. Studies on the use of social media by local and national government and agencies found that social media need to be used as complementary modes of communication to traditional communication channels during a crisis. Further, Facebook was found to be a self-correcting environment and needed no moderating of messages by the governmental agency to verify information to users. The study on earthquake containment and recovery in Haiti found that the Ushahidi platform, which draws information from Twitter, Facebook, blogs and SMS, creates crowd-sourced disaster maps to enable	Moderate(GRADE) Moderate to High (GRADE adapted) Moderate to High(CERQual adapted) Moderate(CERQual) Moderate to High(CERQual adapted) Moderate to High (GRADE adapted) Moderate (CERQual) Moderate to High (CERQual adapted) Moderate(CERQual): Moderate to High (CERQual adapted) Moderate (CERQual) Moderate to High (CERQual adapted) Moderate to High (all 4 tools) Moderate (GRADE adapted, CERQual

UNDESIRABLE RESPONSES, IMPACTS & EFFECTS	What happened that was undesirable? What did not seem to work? What were the undesirable wider impacts and consequences? What had a measurable undesirable effect? In what contexts and with whom? How important are the undesirable anticipated responses/impacts/effects? ○ Not important ○ Somewhat Important ○ Important ○ Very important ○ Varies ○ Don't know		
VALUES	Is there important uncertainty about or variability in how key stakeholders or people value and respond to the phenomena of interest/outcome? In what contexts and with whom? ○ Important uncertainty or variability	Social media are still tools that have not become routine practices in many governmental agencies regarding public health in the countries studied. Obstacles still include the reluctance to learn new ways to communicate, the lack of additional staff to handle the increase of information exchange needs via social media, and missing universal guidelines on best practices of social media in daily operations of public health officials and especially during public health crises events. These obstacles need to be overcome to integrate social media into common strategies of risk communication without overemphasizing their use to not neglect those who cannot benefit from their use.	

	○ Possibly important uncertainty or variability ○ Probably no important uncertainty or variability ○ No important uncertainty or variability ○ Varies ○ Don't know		
RESOURCES REQUIRED	**How large are the resource requirements for the proposed option(s) (costs)?** ○ Large costs ○ Moderate costs ○ Negligible costs and savings ○ Moderate savings ○ Large savings ○ Varies ○ Don't know ○ Not applicable	Studies did not specify costs beyond suggesting that access to different social media, internet connection, computer equipment and most importantly trained staff are needed to build and maintain a social media presence before crises.	

CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES	**What is the certainty of the evidence of resource requirements for the proposed option(s) (costs)?** ○ Very low ○ Low ○ Moderate ○ High ○ **No included studies** ○ Not applicable	No study focused on the costs of building/using social media software and/or social media officers. Some projects were driven by volunteers. Research gaps appeared regarding the phases of a disaster as few studies on the use of social media during the recovery and preparation phases. Geographically, the Southern hemisphere – except for Australia –, that is Africa, Central and South America, South-East Asia, Central Asia, and the Indian Subcontinent as well as Eastern Europe have remained vastly understudied. Within the regions and countries where social media were studied, the vast majority of studies did not analyze the demographics of the social media users beyond their geographic location, their status of being in the disaster zone or outside this zone, and their frequency and content of posting. Socio-economic demographics were not collected and/or analyzed to drill deeper into the implications of using social media to reach vulnerable populations. Who exactly is reached via social media campaigns and who needs to be reached with other means have remained an understudied areas;	
EQUITY	**Does the evidence underpinning the option(s) consider health equity issues or particular contexts or subgroups?** ○ No ○ Yes ○ Varies ○ Don't know	Social media's apparent success in urban Sierra Leone should be balanced against the observation that most mobile phone use was concentrated in larger urban areas. Rural areas remained relatively isolated from social media's effects (81). Research gaps appeared regarding the phases of a disaster as few studies on the use of social media during the recovery and preparation phases. Geographically, the Southern hemisphere – except for Australia –, that is Africa, Central and South America, South-East Asia, Central Asia, and the Indian Subcontinent as well as Eastern Europe have remained vastly understudied. Within the regions and countries where social media were studied, the vast majority of studies did not analyze the demographics of the social media users beyond their geographic location, their status of being in the disaster zone or outside this zone, and their frequency and content of posting. Socio-economic demographics were not collected and/or analyzed to drill deeper into the implications of using social media to reach vulnerable populations. Who exactly is reached via social media campaigns and who needs to be reached with other means have remained an understudied areas;	

ACCEPTABILITY	**Is the option(s) acceptable to key stakeholders?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies ○ Don't know	Social media are still tools that have not become routine practices in many governmental agencies regarding public health in the countries studied. Obstacles still include the reluctance to learn new ways to communicate, the lack of additional staff to handle the increase of information exchange needs via social media, and missing universal guidelines on best practices of social media in daily operations of public health officials and especially during public health crises events. These obstacles need to be overcome to integrate social media into common strategies of risk communication without overemphasizing their use to not neglect those who cannot benefit from their use.	
FEASIBILITY	**Is the option(s) feasible to implement?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies ○ Don't know	Technically it is feasible but the lack of training, resources to build/maintain dedicated social media manager positions needs to be addressed. (See Acceptance.)	

Potential options emerging for recommendation(s)/best practice(s)/ overarching principle (s) implementation consideration (s)

Social media, should be used to monitor public reactions during a crisis, to address the public, create situational awareness, for citizens' peer-to-peer communication and aid, and to solicit responses from the ground

Social media should be used together with traditional news media as part of an integrated communication strategy to spread verified information

Government agencies and implementing partners need to train, employ and pay dedicated social media officers to build relationships with stakeholders and to use social media consistently to build trust and credibility before, during and after emergencies

Summary of judgements

	JUDGEMENT								IMPLICATIONS
PRIORITY PROBLEM	No	Probably no	Probably yes	Yes		Varies	Don't know		
HOW IMPORTANT ARE THE DESIRABLE RESPONSES, IMPACTS & EFFECTS?	Not important	Somewhat important	Important	Very Important		Varies	Don't know		
HOW IMPORTANT ARE THE UNDESIRABLE RESPONSES, IMPACTS & EFFECTS?	Not important	Somewhat important	Important	Very Important		Varies	Don't know		
CERTAINTY/CONFIDENCE OF EVIDENCE BY EVIDENCE TYPE **ADD SEPARATE RATINGS FOR:** **GRADE** **ADAPTED GRADE** **CERQUAL** **ADAPTED CERQUAL**	 Very Low Very Low Very Low Very Low	 Low Low Low Low	 Moderate Moderate Moderate Moderate	 High High High High			 No included studies No included studies No included studies		

	JUDGEMENT								IMPLICATIONS
							No included studies		
VALUES	Important uncertainty or variability	Possibly important uncertainty or variability	Probably no important uncertainty or variability	No important uncertainty or variability		Varies	Don't know		
RESOURCES REQUIRED	Large costs	Moderate costs	Negligible costs and savings	Moderate savings	Large savings	Varies	Don't know	N/A	
CERTAINTY OF EVIDENCE FOR REQUIRED RESOURCES	Very low	Low	Moderate	High			No included studies	N/A	
COST EFFECTIVENESS	Favours the comparison	Probably favours the comparison	Does not favour either the intervention or the comparison	Probably favours the intervention	Favours the intervention	Varies	No included studies	N/A	
DOES THE EVIDENCE CONSIDER EQUITY ISSUES?	No			Yes		Varies	Don't know		
ACCEPTABILITY OF THE OPTION(S)	No	Probably no	Probably yes	Yes		Varies	Don't know		
FEASIBILITY OF THE OPTION(S)	No	Probably no	Probably yes	Yes		Varies	Don't know		

Conclusions

Should

- **Use social media to monitor public reactions during a crisis, to address the public, create situational awareness, for citizens' peer-to-peer communication and aid, and to solicit responses from the ground**
- **Use social media together with traditional news media as part of an integrated communication strategy to spread verified information**
- **Government agencies and implementing partners need to train, employ and pay dedicated social media officers to build relationships with stakeholders and to use social media consistently to build trust and credibility before, during and after emergencies**

be recommended?

TYPE OF RECOMMENDATION	We recommend against the option(s) ○	We suggest considering the option(s): ○ Only in the context of rigorous evaluation ○ Only in specific contexts	We recommend the option(s) ○
RECOMMENDATION			
JUSTIFICATION			
SUBGROUP/EQUITY CONSIDERATIONS			
IMPLEMENTATION CONSIDERATIONS			

MONITORING AND EVALUATION	
RESEARCH PRIORITIES	

Question 11: What are the best ways to communicate uncertainties to public audiences, at-risk communities, and stakeholders?

Problem: (phenomenon of interest)

Trust-building emergency risk communication tactics to communicate uncertainties inherent in events and emergencies with public health implications

Setting: In the context of preparing for and responding to national and international events/emergencies with public health implications in high, low, middle income and fragile states.

Perspective: National governments and relevant subnational authorities (e.g., local/district health departments); journalists; responding and implementing partners; communities, stakeholders

Comparison (Foci to explore and compare): Comparison: Different sources of information (level of authority; local communities, national government authorities); timing of recommendations, announcements, alerts; consistency of messages; labelling recommendations as "interim;" acknowledgement of unknowns, acknowledging what is known). Equity considerations such as local contextual and population characteristics.

Evaluation: (What happened/ what worked/consequences/impact / how effective?):

Impact on public trust in health protection information, acceptance and compliance with recommendation; changes and shifts of information during the course of event/emergency

Time: 2003 onward

Systematic Review Findings:

The country coverage showed mostly high and middle-income countries in Asia, Europe, North America, and Oceania. Only one country was covered in Africa and two countries in Central and South America. The event most covered was infectious disease; other relatively common events included flood and earthquake. All four event phases were covered though there was heavy emphasis on the preparation phase, followed by onset and containment phases; relatively there was much less coverage of the recovery phase. There were several studies that undertook evaluation as well.

The findings identify the following for the phenomenon of uncertainty, as experienced by the public and as information put in a message, during public health emergency events: There are several different types/ components of uncertainty associated with an event, related to both uncertainties experienced by the public and also uncertainty information than can be put in messages, that authorities need to keep in mind.

The public's experience of uncertainty is due to lack of information thus, information from authorities can reduce the public's uncertainty. There is general agreement among experts and researchers that communication by authorities to the public should include explicit information about uncertainties associated with events but it is important to ensure that the information provided is consistent and not contradictory, and is presented clearly and in an easy to understand manner.

To develop messages that contain uncertainty information, it is important to keep in mind the whole living environment of the intended audience as people's lives may be full of uncertainties due to life circumstances and not just because of a particular hazard.

Uncertainty information in messages provided by authorities as predictor is generally associated with desirable outcomes but the possibility of some undesirable outcomes needs to be kept in mind. The public's understanding of some uncertainty information associated with event likelihood estimates is error prone and this error is true of experts as well.

Uncertainty of data and knowledge influences interactions within and among groups of experts and between experts and policy/ decision makers and thus decision making in complex ways. Mass media coverage of an event that emphasizes rapidly changing, contradictory, and conflicting information, especially that which differs from official information from authorities, increases uncertainty in the public, which in turn can lead to several undesirable outcomes, such as lack of trust in authorities and recommended actions. As a result of absent or contradictory and inconsistent information from authorities, medical/ health care workers and policy makers experience uncertainty and the organizational decision making regarding communication to the public becomes uncertain. Authorities should carefully consider these, and other, aspects of uncertainty when developing the best ways to communicate uncertainties to the general public, at-risk/ vulnerable populations, and stakeholders.

Grey Literature Review Findings:

When discussing communication about uncertainties, the grey literature contends that how one communicates a message is nearly equally important as the message content itself.

When Nina Pham contracted Ebola after caring for Thomas Eric Duncan, a wave of fear swept the United States. Had communications been handled better, more in line with the best practices of risk communication, most of this fear could have been avoided. Two risk communication errors were made. First was the failure to communicate openly: no mention was made of the fact that Personal Protective Equipment (PPE) protocol had been breached. Second, scientists failed to communicate clearly about true risk levels facing average Americans at that point in time. Rather than clearly enunciating that no single case of Ebola had been transmitted by asymptomatic infected persons or by aerosol transmission, answers to such questions hedged on the one hand (asymptomatic cases) and speculated on the other (aerosol transmission). A frank answer that chances of such kinds of transmission were as near zero as is possible to get would have been better (86). Sources concurred that if uncertainties exist, they need to be admitted openly (13, 18, 21).

Conversely, the CDC's first communications expressed great confidence that there was no risk of American health workers contracting the disease. This over-confidence gave the impression of more certainty about Ebola than actually existed. It also ignored or silenced other, more cautious voices in the medical community, pretending to a consensus that did not exist (83). This violated one of the cardinal rules of communicating uncertainty: Admit it (18, 21, 83).

Another lesson about communicating uncertainty came from the messages concerning Ebola and the consumption of bush meat. Initially messages warning against touching dead bodies or body fluids and against eating bush meat were presented as equally important. Later the bush meat messages were discontinued, yet no explanation of this change was made (46, 47). This was counter to another principle of risk communication: If something uncertain has been communicated as certainty and then discovered to be incorrect, acknowledge and clarify the error.

In summary, when uncertainties exist, they need to be admitted openly and frankly. A total of eight documents were identified as relevant to communicating uncertainties, one source was of low credibility, three of moderate, and four of high.

Gaps

The systematic review identified several gaps in the literature on the phenomenon of uncertainty during public health emergency events, including lack of comprehensive examination of the various conceptualizations and components of uncertainty; paucity of studies examining message designs that can augment understanding of

uncertainty information; insufficient comparative research across countries, especially across low and high income countries; not enough attention paid to the vulnerable populations, who often have least access to information resources and exposure to official information; and absence of longitudinal studies

Question 11: What are the best ways to communicate uncertainties to public audiences, at-risk communities, and stakeholders?

- **Communication by the authorities to the public should include explicit information about uncertainties associated with risks, events and interventions.**

- ~~**Absence of information increases experience of uncertainty and information from authorities reduces this uncertainty**~~

- ~~**Authorities must provide information speedily, timely and reliably**~~

Assessment

	JUDGEMENT	RESEARCH & GREY EVIDENCE	ASSESSMENT OF CONFIDENCE IN THE EVIDENCE (ASSESSMENT TOOL)
PROBLEM	**Is the problem a priority?** ○ No ○ Probably no ○ Probably yes ○ Yes X ○ Varies ○ Don't know	**Review findings:** As a result of absent or contradictory and inconsistent information from authorities, medical/ health care workers and policy makers experience uncertainty and the organizational decision making regarding communication to the public becomes uncertain. Instead of providing transparent communication regarding the uncertainty surrounding an emergent event, if authorities rush to declare a "fact" about the event without adequate information, it can lead to compromised decision making and efforts by organizations. Countries covered are Canada, France, and Israel. Event is infectious disease. Onset and containment phases are covered. No vulnerable populations are included. **Grey literature:** When discussing communication about uncertainties, the grey literature contends that how one communicates a message is nearly equally important as the message content itself	Moderate(CERQual adapted))

DESIRABLE RESPONSES,&IMPACTS & EFFECTS	**What happened that was desirable**? What seemed to work? What were the desirable wider impacts and consequences? What had a measurable desirable effect? In what contexts and with whom? How important are the desirable anticipated responses/impacts/effects? ○ Not important ○ Somewhat Important ○ Important ○ Very important ○ Varies ○ Don't know	In Austria, Belgium, Canada, Norway, Russia, South Africa, the United Kingdom, and several European countries, for flood, infectious disease, industrial accident, and general public health, and for all four phases as well as evaluation, uncertainty information in messages provided by authorities as predictor is associated with the following outcomes: reduced experienced uncertainty; reduced uncertainty about protection actions; avoidance of information void; reduced misinformation; prevention of rumours; reduced indifference; reduced reliance on sensationalized stories; increased sense that situation is under control; and efficiency, quality, and value of forecasts. The uncertainty information should be timely, full, and unbiased. (important) (best practices) In Thailand, New Zealand, the United Kingdom, and the United States, for food contamination, industrial accident, volcanic, and wildfire events, and for preparation and recovery phases, it should be noted that there are different types/components to the public's experience of uncertainty. As examples, one classification notes three types: uncertainty regarding personal safety; safety of home; and safety of close others. Another classification also notes three types: uncertainty about event knowledge; data; and outcome. Along the same lines, there is risk assessment uncertainty and event outcome uncertainty. Another classification shows seven types of uncertainty: uncertainty about who is affected; temporal uncertainty (uncertainty about past and future states); measurement uncertainty; uncertainty due to scientific disagreement; uncertainty about the risk to humans; uncertainty about the extent (or size) of the risk; and uncertainty about how to deal with and reduce the risk.	Moderate(CERQual adapted) Low (GRADE adapted)
UNDESIRABLE RESPONSES, IMPACTS & EFFECTS		In Thailand, New Zealand, and globally, for foodborne illness, industrial accident, and volcanic events, for preparation and containment phases, and including for low SES population, there is general agreement among experts, both scientists and non-scientists, and researchers that communication by authorities to the public should include explicit information about uncertainties associated with events. (very important) (principle)	Moderate (GRADE adapted)

		In Australia, Japan, the United Kingdom, and the United States, for earthquake, flood, tornado, and infectious disease, for all phases, and including for school children, lack of information increases experience of uncertainty and information from authorities reduces this uncertainty. Authorities must provide information speedily, timely, and reliably. People actively seek information to reduce their uncertainty, especially through social media, and the authorities too should use this medium for information dissemination. (very important) (best practice, recommendation)	High (CERQual)
		In Canada, China, several European countries, and the United States, for bioterrorism, flood, general public health, and infectious disease, for preparation, onset, and containment phases as well as evaluation, and including for low SES minorities, pregnant women, children, and people with chronic disease populations, there is general agreement among experts and researchers that communication by authorities to the public should include explicit information about uncertainties associated with events. It is important to ensure that the information provided is consistent and not contradictory, and is presented clearly and in an easy to understand manner. (very important) (best practice, recommendation)	Moderate(CERQual)
		In France, Russia, and the United States, for flood, hurricane, and general public health events, and for preparation and onset phases as well as evaluation, uncertainty information provided in messages as predictor is associated with the outcomes of: confidence in forecasts; reduction in circulation of misinformation; and improved risk management. (important) (best practice)	Moderate(CERQual)
		In Russia and the United States, for flood and general public health events, and for preparation phase, there are several types of uncertainty information that can be put in messages by authorities. In particular, these include knowledge uncertainty (limitations of scientific understanding of complex natural processes and future changes) and sampling uncertainty (uncertainty in estimates calculated using limited data samples from naturally variable processes). The uncertainties can also be about results of checks and examinations of event control mechanisms and health affecting properties of dangerous materials produced by industry. It should be noted that often uncertainty becomes confounded with values issues, which deal with the appropriate standards of public protection. (important)	Moderate(CERQual adapted))
			Moderate to High(CERQual)

		(principle)	Moderate (CERQual adapted)
	What happened that was undesirable? What did not seem to work? What were the undesirable wider impacts and consequences? What had a measurable undesirable effect? In what contexts and with whom?	**Undesirable** Mass media coverage of an event that emphasizes rapidly changing, contradictory, and conflicting information, especially that differs from official information from authorities, increases uncertainty in the public, which in turn can lead to several undesirable outcomes. These include: lack of trust in authorities and recommended actions; confusion and fear; reduced intentions for health protective behaviours such as vaccination; and reduced attention to health risk news. Such media coverage also puts a constraint on the ability of frontline health/medical workers to address the public's uncertainty. Countries covered are Canada, France, and the United States. Events are bioterrorism, infectious disease, tornado, and general public health. All four phases are covered. Low SES minorities, vulnerable population included. (important)	Low to Moderate (GRADE)
		In the United States for an infectious disease event for onset and containment phases, trust in authorities may show a slight decrease as a result of openly acknowledging uncertainties in messages. However, this decrease is only for a small proportion of the total number of message recipients; for the vast majority of message recipients, there is no change in their level of trust (important)	
		The uncertainty about specific parameters of an event may sometimes leave people without enough time to prepare property or move belongings to a safe location. Also, the phrasing of the uncertainty information may sometimes be interpreted negatively, which may affect response to future risk communication. (important)	Low to Moderate (GRADE) Low to moderate(GRADE adapted)Moderate(CERQual)
		In Canada and France for an infectious disease event, and for onset and containment phases, uncertainty about an event conveyed by mass media coverage through rapidly	

	How important are the undesirable anticipated responses/impacts/effects? ○ Not important ○ Somewhat Important ○ Important ○ Very important ○ Varies ○ Don't know	changing, contradictory, and conflicting information, especially that which differs from official information from authorities, increases uncertainty and fear in the public, and puts a constraint on health/medical workers ability to address the public's uncertainty. (very important) In Canada, France, and Israel, for infectious disease event, and for onset and containment phases, and for medical/ health care workers and policy makers. As a result of absent or contradictory and inconsistent information from authorities, medical/ health care workers and policy makers experience uncertainty and the organizational decision making regarding communication to the public becomes uncertain. Instead of providing transparent communication regarding the uncertainty surrounding an emergent event, if authorities rush to declare a "fact" about the event without adequate information, it can lead to compromised decision making and efforts by organizations. (very important)	Moderate to High (CERQual adapted) Moderate(Cerqual adapted) Moderate (CERQual adapted)
VALUES	Is there important uncertainty about or variability in how key stakeholders or people value and respond to the phenomena of interest/outcome? In what contexts and with whom? ○ Important uncertainty or variability ○ Possibly important uncertainty or variability ○ Probably no important uncertainty	In the United States, for food contamination event, and for preparation phase, experts/scientists indicate that providing information about scientific uncertainty will have a negative impact on the extent to which the public trusts science, scientists, and scientific institutions; their view is that the general public is unable to conceptualize uncertainties associated with risk management processes and so providing the public with information about uncertainty will cause panic and confusion regarding the extent and impact of a particular event. Uncertainty of data and knowledge influences interactions within and among groups of experts and between experts and policy/ decision makers and thus the decision-making process in complex ways. It is important to see a final decision (e.g., evacuation warning) as the end point of a chain of decisions that includes a flow of uncertainty information. Experts	Moderate (Cerqual adapted) Moderate(CERQual)

	or variability ○ No important uncertainty or variability ○ Varies ○ Don't know	have to use (scientifically) uncertain data, and in rapidly evolving situations where multiple actors have to make interrelated decisions under this uncertainty, there is a greater danger of risk assessment propagating across individuals in unintended ways. Different people in the decision chain perceive and understand uncertainty, and tend to act in face of uncertain information,, differently. For example, policy/ decision makers may not fully understand scientific uncertainty and may default to their intuitions and experience to make decisions. Additionally, uncertain scientific knowledge is entwined with values issues (appropriate standards for public protection), which makes the decision chain process even more complex. Countries covered include several European countries and the United States. Event is floods, and preparation and onset phases are covered along with evaluation. No vulnerable populations are included.	Moderate to High(Cerqual adapted)
RESOURCES REQUIRED	**How large are the resource requirements for the proposed option(s) (costs)?** ○ Large costs ○ Moderate costs ○ Negligible costs and savings ○ Moderate savings ○ Large savings ○ Varies ○ Don't know ○ Not applicable		

CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES	**What is the certainty of the evidence of resource requirements for the proposed option(s) (costs)?** ○ Very low ○ Low ○ Moderate ○ High ○ No included studies ○ Not applicable		
EQUITY	**Does the evidence underpinning the option(s) consider health equity issues or particular contexts or subgroups?** ○ No ○ Yes ○ Varies ○ Don't know	To develop messages that contain uncertainty information, it is important to keep in mind the whole living environment of the intended audience. People's lives may be full of uncertainties due to poverty and not just because of a particular hazard. It should be recognized that issues of development and environment are just as central to reduced uncertainty regarding an event as messages from authorities. Countries covered include Chile and Indonesia. Events are flood and landslide, and the phase is preparation. Low SES vulnerable populations are included.	Moderate (Cerqual adapted)
ACCEPTABILITY	**Is the option(s) acceptable to key stakeholders?** ○ No ○ Probably no ○ Probably yes	In Thailand, New Zealand, and globally, for foodborne illness, industrial accident, and volcanic events, for preparation and containment phases, and including for low SES population, there is general agreement among experts, both scientists and non-scientists, and researchers that communication by authorities to the public should include explicit	Moderate (GRADE adapted)

	○ Yes ○ Varies ○ Don't know	information about uncertainties associated with events. In the United States, for food contamination event, and for preparation phase, experts/scientists indicate that providing information about scientific uncertainty will have a negative impact on the extent to which the public trusts science, scientists, and scientific institutions; their view is that the general public is unable to conceptualize uncertainties associated with risk management processes and so providing the public with information about uncertainty will cause panic and confusion regarding the extent and impact of a particular event.	
FEASIBILITY	**Is the option(s) feasible to implement?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies ○ Don't know		

Summary of judgements

JUDGEMENT		IMPLICATIONS

	JUDGEMENT								IMPLICATIONS
PRIORITY PROBLEM	No	Probably no	Probably yes	Yes		Varies	Don't know		
HOW IMPORTANT ARE THE DESIRABLE RESPONSES, IMPACTS & EFFECTS?	Not important	Somewhat important	Important	Very Important		Varies	Don't know		
HOW IMPORTANT ARE THE UNDESIRABLE RESPONSES, IMPACTS & EFFECTS?	Not important	Somewhat important	Important	Very Important		Varies	Don't know		
CERTAINTY/CONFIDENCE OF EVIDENCE BY EVIDENCE TYPE **ADD SEPARATE RATINGS FOR:** **GRADE** **ADAPTED GRADE** **CERQUAL** **ADAPTED CERQUAL**	 Very Low Very Low Very Low Very Low	 Low Low Low Low	 Moderate Moderate Moderate Moderate	 High High High High			 No included studies No included studies No included studies No included studies		
VALUES	Important uncertainty or	Possibly important	Probably no important	No important uncertainty or		Varies	Don't know		

	JUDGEMENT								IMPLICATIONS
	variability	uncertainty or variability	uncertainty or variability	variability					
RESOURCES REQUIRED	Large costs	Moderate costs	Negligible costs and savings	Moderate savings	Large savings	Varies	Don't know	N/A	
CERTAINTY OF EVIDENCE FOR REQUIRED RESOURCES	Very low	Low	Moderate	High			No included studies	N/A	
COST EFFECTIVENESS	Favours the comparison	Probably favours the comparison	Does not favour either the intervention or the comparison	Probably favours the intervention	Favours the intervention	Varies	No included studies	N/A	
DOES THE EVIDENCE CONSIDER EQUITY ISSUES?	No			Yes		Varies	Don't know		
ACCEPTABILITY OF THE OPTION(S)	No	Probably no	Probably yes	Yes		Varies	Don't know		
FEASIBILITY OF THE OPTION(S)	No	Probably no	Probably yes	Yes		Varies	Don't know		

Conclusions

Should

- **Communication by the authorities to the public should include explicit information about uncertainties associated with events. (rec? Best practice?)**
- **Absence of information increases the experience of uncertainty; information from authorities reduces uncertainty (principle?)**
- **Authorities must provide information speedily, timely and reliably**

be recommended?

TYPE OF RECOMMENDATION	We recommend against the option(s) ○	We suggest considering the option(s): ○ Only in the context of rigorous evaluation ○ Only in specific contexts	We recommend the option(s) ○
RECOMMENDATION			
JUSTIFICATION			
SUBGROUP/EQUITY CONSIDERATIONS			
IMPLEMENTATION CONSIDERATIONS			
MONITORING AND EVALUATION			
RESEARCH PRIORITIES			

MESSAGING/MESSAGE ELEMENTS AND TIMING

Question 12: What elements and timing of messages are best at influencing public/community levels of concern to motivate relevant actions to protect health?

Problem: (phenomenon of interest): Timing and content of emergency risk communication messages designed to raise/lower public and community concerns about threats

Setting: In the context of preparing for and responding to national and international events/emergencies with public health implications in high, low, middle income and fragile states.

Perspective: National governments and relevant subnational authorities (e.g., local/district health departments); journalists; responding partners; communities.

Comparison (Foci to explore and compare): Different phases of event/emergency, different sources of information (level of authority, local communities, national government authorities), consistency and frequency of messages, different types of appeals. Equity considerations such as local contextual and population characteristics

Evaluation: (**What happened/ what worked/consequences/impact / how effective?**): Impact on public trust in health protection information, level of motivation to act on health recommendations, level of compliance with health recommendations

Time: 2003 onward

Systematic Review Findings:

Messages should come from different information sources and emerge early in the event. This finding may be connected to individual trust in government and the specifics of the social and political system in which the message arises, but it is also connected to the finding that messages conveyed through any channel will prompt people to seek additional information from other information channels, including interpersonal and social media networks.

Messages should be conveyed in non-technical language, and the lack of an early message allows rumours to take hold. Women respond to risk messages differently than men. This emphasis on non-technical language tops a lengthy list of research findings that document how and why messages do not promote behaviour change. However, this body of information is context dependent; it is both impossible and unwise to generalize these findings beyond specific kinds of events and/ or specific cultural and political systems.

Messages from most sources will be integrated with messages from other sources, whether that is the mass media or family and friends. Because of this message integration at the individual level, messages should be developed from the "bottom up" so that culture and politics may be considered. That consideration of local cultural understanding will allow messages to recommend specific health protection behaviours appropriate to the culture.

Finally, it is important to note that many sorts of messages will be dismissed by individuals and sometimes communities for a variety of non-generalizable but sometimes shared reasons. For example, getting people to evacuate or obey quarantine restrictions is difficult across cultures and political systems, but the reasons that underlie that difficulty vary widely.

Grey Literature Review Findings:

Twenty-one documents contained evidence pertinent to the question of message elements and timing that are best at motivating behaviour change, 12 from moderately and nine from highly credible sources. Of these, seven were Knowledge, Attitude, Practice (KAP) studies. Although their findings are relevant to their particular outbreak in their particular location, they are not necessarily generalizable. As such they are not discussed here.

The grey literature found that uptake of protective health messages was impacted by a number of different factors. One was where the messages were placed. It is critically important to know where people get their health information (85). Without this, even the best-crafted message may be wasted by placing it where it will not be noticed. This should be assessed by target group, as media consumption varies greatly. Nor was the message medium the only concern.

Sources' credibility and trustworthiness also impacted the adoption of behaviour changes. Several documents found that invoking credible sources (18, 21, 87), or the opinions of trusted community leaders, family members or friends could influence behaviour changes (49). Use of survivor numbers and stories also encouraged behaviour uptake (20). One report noted that if experts were used, reference must also be made to their trustworthiness (21).

One document stated that information about risks needs to be communicated promptly so that people have time to make informed choices. It also should take place while debate is on-going. If one waits until a situation calms down, public attention will wander elsewhere. It also found that repeating messages frequently facilitates uptake (18).

Communities were more likely to accept and act on messages when the messages were practical (42) and tailored to their culture and circumstances (18, 20, 42, 43, 63), and when they had participated in the messages' development (42, 63). The uptake effect was amplified still more when the community assessed the outbreak themselves (43). A two-way process of communication and feedback increased messages' effectiveness, as did responding to people's fears (18, 21, 36, 42). One report emphasized that special focus should be directed to minority populations (18).

Two studies found that inconsistencies breed mistrust. If messages change over time, the reasons for the changes must be explained and puzzling elements clarified (18, 46). Communications need to be candid, open and honest and uncertainties need to be acknowledged (18, 21). Clear distinction should be made between messages that are evidence based, and those that are less certain (36). Messages should be coordinated (36) and communicate confidence while allowing for improved knowledge and changing circumstances (18, 21). Their effectiveness should be continually monitored so they may be improved and adapted as needed (66). Capturing the imagination with story-telling and drama was also found to improve message uptake and implementation (36, 42).

The tone of messages was also found to be important. Messages needed to convey compassion, concern, empathy (18, 21), and self-efficacy (18, 21, 36, 49). They needed to be phrased in clear, non-technical language, preferably the local language. They should clearly state who should do what, where, when, how and why (18). Messages need to be framed in terms of the values of those who oppose the desired behaviour change. Opposition strong points should be worked into messages, along with appreciation of different points of view (18).

Finally, it was found that messages need to clearly state what the difference is between the crisis situation and a normal one (52). They also need to address perceived norms and positive and negative consequences (49).

Other Evidence (add in any cross references from other questions)

Gaps

There remain important gaps in the literature. There are no comparative studies, such as studies that examine human response across the same set of questions across multiple types of events and studies that compare the response in different countries with different political systems across the same type of event within roughly the same time frame. There is also no work about impacts of risk communication in the earliest days of an outbreak; how the public's risk information needs change during the course of an event; and how individual preparedness for emergent infectious disease can be promoted.

Potential options emerging for recommendation(s)/best practice(s)/ overarching principle (s) implementation consideration (s)

- Explaining risk in probabilistic and technical terms is not helpful for promoting risk mitigation behaviours
- Messages should come from different information sources and emerge early in the outbreak: (lack of early messages allows rumours to take hold).
- Messages must arise from, and be adapted to cultural context by using pretesting with intended audiences.
- Messages should promote action, e.g. specific actions people can do to protect their health

Question: Are these recommendations? Best practices? Overarching principles? Implementation considerations?

Assessment

	JUDGEMENT	RESEARCH & GREY EVIDENCE	ASSESSMENT OF CONFIDENCE IN THE EVIDENCE (ASSESSMENT TOOL)
PROBLEM	**Is the problem a priority?** o No o Probably no o Probably yes o Yes o Varies o Don't know		

DESIRABLE RESPONSES,&IMPACTS & EFFECTS	What happened that was desirable? What seemed to work? What were the desirable wider impacts and consequences? What had a measurable desirable effect? In what contexts and with whom? How important are the desirable anticipated responses/impacts/effects? ○ Not important ○ Somewhat Important ○ Important ○ Very important ○ Varies ○ Don't know	Systematic review: Messages should come from different information sources; messages from organizations are more believable than user generated web content; same message can prompt different responses from different receivers Messages should be developed before an event and emerge early in the event; public health officials are urged to provide clear, timely, reliable information in non-technical language Mediated messages will be integrated with communication from family, friends and social networks. Messages must arise from and be adapted to cultural context; women respond distinctively to risk messages.	Low to moderate (Grade adapted) Moderate (CERQual) Low to Moderate (GRADE adapted) Moderate(CERQUAL) Moderate(CERQual adapted) Low to Moderate(GRADE adapted) Moderate(CERQual) Moderate (CERqual adapted) Low(GRADE adapted) Moderate(Cerqual adapted)

UNDESIRABLE RESPONSES, IMPACTS & EFFECTS		**Grey literature** Sources' credibility and trustworthiness impacted the adoption of behaviour changes. Several documents found that invoking credible sources (18, 21, 87), or the opinions of trusted community leaders, family members or friends could influence behaviour changes (49). Use of survivor numbers and stories also encouraged behaviour uptake (20). One report noted that if experts were used, reference must also be made to their trustworthiness (21). Communities were more likely to accept and act on messages when the messages were practical (42) and tailored to their culture and circumstances (18, 20, 42, 43, 63), and when they had participated in the messages' development (42, 63). The uptake effect was amplified still more when the community assessed the outbreak themselves (43). A two-way process of communication and feedback increased messages' effectiveness, as did responding to people's fears (18, 21, 36, 42). One report emphasized that special focus should be directed to minority populations (18).	
	What happened that was undesirable? What did not seem to work? What were the undesirable wider impacts and consequences? What had a measurable undesirable effect? In what contexts and with whom?	**Undesirable effects** **Systematic review:** Messages will not work well if: they do not take into consideration social and family networks; if they are identical; if they strike people as manipulative; if information sources do not have public health expertise; and if people do not have baseline knowledge to understand and remember messages. Message source makes a difference in how messages are interpreted.	Low to moderate(GRADE adapted, CERQual, CERQual adapted)
	How important are the undesirable anticipated	Absence of early communication can promote rumours.	Low(GRADE adapted)

	responses/impacts/effects? ○ Not important ○ Somewhat Important ○ Important ○ Very important ○ Varies ○ Don't know	Technical messages are ineffective. People ignore them in most contexts. **Grey literature review:** Two studies found that inconsistencies breed mistrust. If messages change over time, the reasons for the changes must be explained and puzzling elements clarified (18, 46). Communications need to be candid, open and honest and uncertainties need to be acknowledged (18, 21). Clear distinction should be made between messages that are evidence based, and those that are less certain (36).	Low(CERQual) Low to Moderate (CERQual Adapted)
VALUES	Is there important uncertainty about or variability in how key stakeholders or people value and respond to the phenomena of interest/outcome? In what contexts and with whom? ○ Important uncertainty or variability ○ Possibly important uncertainty or variability ○ Probably no important uncertainty or variability ○ No important uncertainty or variability ○ Varies ○ Don't know	The same message can prompt different responses from different receivers, including stakeholders and experts. The same message may be interpreted differently in different political contexts. Different events may require different messages.	

RESOURCES REQUIRED	**How large are the resource requirements for the proposed option(s) (costs)?** ○ Large costs ○ Moderate costs ○ Negligible costs and savings ○ Moderate savings ○ Large savings ○ Varies ○ Don't know ○ Not applicable	None of the studies specifically spoke to cost issues. However, development of information strategies and campaigns and their evaluation can require moderate costs.	
CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES	**What is the certainty of the evidence of resource requirements for the proposed option(s) (costs)?** ○ Very low ○ Low ○ Moderate ○ High ○ No included studies ○ Not applicable	None of the studies specifically spoke to this requirement.	
EQUITY	**Does the evidence underpinning the option(s) consider health equity**	Very few studies examined at-risk/ vulnerable populations. Some studies focused on at-risk groups but lacked comparison information with the general population.	

	issues or particular contexts or subgroups? ○ No ○ Yes ○ Varies ○ Don't know		
ACCEPTABILITY	**Is the option(s) acceptable to key stakeholders?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies ○ Don't know	At the national level this will vary, depending on political and social system, infrastructure, and urgency of event.	
FEASIBILITY	**Is the option(s) feasible to implement?** ○ No ○ Probably no ○ Probably yes ○ Yes ○ Varies ○ Don't know		

Potential options emerging for recommendation(s)/best practice(s)/ overarching principle (s) implementation consideration (s)

- Messages should come from different information sources and emerge early in the outbreak: (lack of early messages allows rumours to take hold).
- Messages must arise from, and be adapted to cultural context by using pretesting with intended audiences.
- Messages should promote action, e.g. specific actions people can do to protect their health
- Explaining risk in probabilistic and technical terms is not helpful for promoting risk mitigation behaviours (implementation consideration?)

Summary of judgements

	JUDGEMENT								IMPLICATIONS
PRIORITY PROBLEM	No	Probably no	Probably yes	Yes		Varies	Don't know		
HOW IMPORTANT ARE THE DESIRABLE RESPONSES, IMPACTS & EFFECTS?	Not important	Somewhat important	Important	Very Important		Varies	Don't know		
HOW IMPORTANT ARE THE UNDESIRABLE RESPONSES, IMPACTS & EFFECTS?	Not important	Somewhat important	Important	Very Important		Varies	Don't know		
CERTAINTY/CONFIDENCE OF EVIDENCE BY EVIDENCE TYPE **ADD SEPARATE RATINGS**									

	JUDGEMENT								IMPLICATIONS
FOR: **GRADE** **ADAPTED GRADE** **CERQUAL** **ADAPTED CERQUAL**	 Very Low Very Low Very Low Very Low	 Low Low Low Low	 Moderate Moderate Moderate Moderate	 High High High High			 No included studies No included studies No included studies No included studies		
VALUES	Important uncertainty or variability	Possibly important uncertainty or variability	Probably no important uncertainty or variability	No important uncertainty or variability		Varies	Don't know		
RESOURCES REQUIRED	Large costs	Moderate costs	Negligible costs and savings	Moderate savings	Large savings	Varies	Don't know	N/A	
CERTAINTY OF EVIDENCE FOR REQUIRED RESOURCES	Very low	Low	Moderate	High			No included studies	N/A	
COST EFFECTIVENESS	Favours the comparison	Probably favours the comparison	Does not favour either the	Probably favours the	Favours the intervention	Varies	No included studies		

	JUDGEMENT								IMPLICATIONS
			intervention or the comparison	intervention				N/A	
DOES THE EVIDENCE CONSIDER EQUITY ISSUES?	No			Yes		Varies	Don't know		
ACCEPTABILITY OF THE OPTION(S)	No	Probably no	Probably yes	Yes		Varies	Don't know		
FEASIBILITY OF THE OPTION(S)	No	Probably no	Probably yes	Yes		Varies	Don't know		

Conclusions

Should

- Messages should come from different information sources and emerge early in the outbreak: (lack of early messages allows rumours to take hold).
- Messages must arise from, and be adapted to cultural context by using pretesting with intended audiences.
- Messages should promote action, e.g. specific actions people can do to protect their health
- Explaining risk in probabilistic and technical terms is not helpful for promoting risk mitigation behaviours (implementation consideration?)

be recommended?

TYPE OF RECOMMENDATION	We recommend against the option(s) ○	We suggest considering the option(s): ○ Only in the context of rigorous evaluation ○ Only in specific contexts	We recommend the option(s) ○
RECOMMENDATION			
JUSTIFICATION			
SUBGROUP/EQUITY CONSIDERATIONS			
IMPLEMENTATION CONSIDERATIONS			
MONITORING AND EVALUATION			
RESEARCH PRIORITIES			