Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
Invited view point

Should I stay or should I go now? Why risk communication is the critical component in disaster risk reduction

Bapon Fakhruddin a,⁎, Helen Clark b, Lisa Robinson c,⁎, Loretta Hieber-Girardet d

a Tonkin + Taylor International, New Zealand
b Former Prime Minister of New Zealand
c BBC Media Action, UK
d United Nations Office for Disaster Risk Reduction, Thailand

1. Risk communication

There are varying views on risk communication and what makes for an effective system. Risk is subjective and may hold multiple meanings, depending on the circumstance and the discipline. A commonly accepted language among all communities when comparing risks is important [1]. COVID-19 has provided an excellent opportunity to analyse hazard risk communication and its effectiveness at the community level. Risk communication has several elements, and every single element needs considered equally (Fig. 1). The need for people-centred risk communication and the establishment of the wide range of differences among people inherently determines the need for different approaches to communicate about risk with the population [2,19].

A challenging aspect of risk communication for experts is how to deal with communicating uncertainty. Uncertainty exists in most, if not all, scientific information, especially information associated with natural hazards. With recent increases in a call for transparency in decisions about risk management, some communication of uncertainty is needed to ensure that the public understands the limitations of the source of information and to safeguard the communicator if the information is seen as a ‘false alarm’ [3].

1.1. Risk communication as a component of early warning systems

The goal of an early warning system is to prevent hazards from becoming disasters. An early warning system, however, can only protect people when the warning is received in a timely fashion, the meaning of the warning is understood, and the appropriate actions are taken. Therefore, risk communication plays a critical role in an early warning system.

In risk communication, two fundamental elements within the early warning system are inter-linked: dissemination and notification, and community capacity (connection and response). Dissemination refers to the process of physically getting the message out, while notification refers to the way that the message is received and understood [4]. A robust information dissemination system is needed to ensure that messages do not get changed as they filter down through the various layers (from the national to the provincial, district, and local), and that they arrive on time to the communities at risk.

Community engagement is a key factor in the risk communication framework. On many occasions, risk has been misinterpreted by people, when there is no sufficient engagement by the providers or users. Risk communication is also highly dependent on several other elements within the
risk framework. Comprehensive risk assessments may be undertaken with confidence and good governance structures may be in place, but risk perception, risk awareness, and risk interpretation must also be included – otherwise, early warning may fail (Fig. 1). For example, in the Orewa community in New Zealand, a comprehensive risk assessment has been undertaken and good risk governance was in place. With a lack, however, in risk perception, risk awareness, trust and interpretation, the whole community has the potential of being at risk.

1.2. Early warning systems and the Sendai Framework for Disaster Risk Reduction 2015–2030

The Sendai Framework for Disaster Risk Reduction 2015–2030 is a globally agreed, non-binding agreement that serves as a roadmap for countries to reduce disaster losses by 2030 [6]. Within the framework, there are seven targets. Target G calls on countries to “substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030” [7]. This shows how critical these systems are for reducing disaster risk within a community. The Sendai Framework calls for a people centred approach when designing early warning systems. Therefore, understanding risk, monitoring and forecasting hazards, warning, and dissemination and preparedness components of an early warning system must be designed with the goal of helping all people. Risk communication is a critical, cross-cutting theme across all components [8]. To ensure that an early warning system is effective, the following critical risk communication elements should be included:

- Authorities helping at-risk communities understand the risks they face
- People knowing what can and what cannot be expected from an early warning system
- Warning messages that are trusted, timely, accurate, simple, and must reach the “last mile” and the most vulnerable
- Community knowledge of what to do when they receive an early warning
- Trust in the warning information and its providers.

When countries include all these risk communication elements into an early warning system, the likelihood of saving lives is increased. The process, however, takes time and effort, and countries must be invested in it. An example of where such investment has paid off is in Bangladesh. In 1970, approximately 300,000 died as a result of Cyclone Bhola, compared to 3000 in 2007 during Cyclone Sidr and to 26 people during Super Cyclone Amphan in 2020. This is credited to the emphasis on risk communication in the Bangladesh Cyclone Preparedness Programme which covers all coastal areas, and whose motto is “bridging the last meter” and not just the “last mile” (Climate [9]). The programme is a joint venture between the Government of Bangladesh and the Bangladesh Red Crescent Society. A large network of around 56,000 volunteers conducted house-to-house engagements and held events to help people understand their risks [10]. Drills were conducted within communities using advocacy material in different languages. This programme has been expanded to include the Rohingya refugee camp where close to one million people live.

An example of where a lack of risk communication contributed to a disaster was in the Indonesian city of Palu, when it was struck by an earthquake and subsequent tsunami in September 2018 [11]. The tsunami was locally sourced (in some areas, it only took 5 min to reach land), but tsunami warning alerts did not reach the communities at risk in time because of technology limitations and disruptions in the long chain of the early warning system. Risk communication could have made a significant difference within this community as there was a lack of knowledge about tsunamis and about how the early warning system worked.

Fig. 1. Risk communication framework for early warning systems [5].
1.3. COVID-19 pandemic and risk communication

An early review of the COVID-19 pandemic response has shown that many countries were not prepared for a novel coronavirus. The 2019 Johns Hopkins Global Health Security Index rankings placed the United States of America first on the list as the most prepared for a pandemic. They placed the United Kingdom in second place, Brazil at 22nd, Mexico 28th, and New Zealand 35th (John [12]). The evidence, however, show that New Zealand has had one of the best rates of response globally to COVID-19 [13]. That was not due to it being a remote set of islands, but rather to the bespoke nature of its pandemic plan and response that included the following actions and took a zero tolerance approach:

- The early travel ban on specific countries, implemented from February 2020
- The entire ban of travel to New Zealand for all except permanent residents and citizens from late March
- Strict national lockdown to get processes and systems in place to respond effectively
- Continuous strict quarantining for New Zealand citizens and permanent residents returning to the country and for others permitted to enter.

An effective response to COVID-19 includes the quality of communication to citizens. A number of the countries led by women, including New Zealand, Denmark, Norway, and Germany have excelled in their COVID-19 responses and communications [14]. They have been seen to prioritise the health security and wellbeing of their people and have conveyed high levels of empathy. Leaders in general who adopted such an approach have taken heed of the best available scientific and public health advice. Communicating what is known clearly with total transparency, admitting to what is not known, and setting out the basis on which measures need to be taken and where the public needs to engage and follow those measures are vital. In countries where there is a lack of trust in government, an effective pandemic response is harder and death rates are higher [13].

Additional barriers to effective responses include the lack of universal health coverage and where there are groups of marginalised people excluded from the system. [15].

Looking ahead, countries need to have risk-informed planning; if development is not risk-informed, it is not sustainable development. Years of gains have been wiped away by global- and national-level lack of preparedness for adverse events. Countries need to have flexible and agile pandemic plans, and good testing and tracing systems (technology is key). Public health tools that have worked this time around need to be accessible and ready to pull out whenever required, such as mask wearing and social distancing. Additionally, readiness for managed isolation and quarantine procedures are needed. Plans for social protection during pandemics are needed. Business continuity for schools and supporting local businesses is also crucial. Above all, the periods of lockdown must be used to put systems and processes in place to ensure continual improvement.

2. Recommendations to improve risk communication

In disaster risk reduction, there is often a huge emphasis on planning and foresight to ensure reduced impact, yet risk communication is frequently at the tail end of that process rather than integrated throughout. It is assumed that as long as early warning information is produced at the right time, the right action will occur. Unfortunately, this is not always the case (National Research Council (US) Committee [16]). We humans are complex and cognitive processes can lead us to disregard what may be perfectly sound information and advice. Therefore, to improve risk communication, it needs to be remembered that communication is a process, not a product (NOAA [17]).

2.1. Understanding people

To ensure that the process of communication is effective, it needs to be understood what people think, feel and do about risk, and what makes it easy or difficult for them to take certain actions. Understanding people’s demographics, values and beliefs as well as their media consumption patterns and who they trust is also important. This information will lead to developing tools and processes that make it easier for people to consider their options and take action. Communicating about risk should connect with what people care about, often related to family, finances, entertainment, and fitting in. For example, in Bangladesh, many people knew what to do ahead of cyclones, but many did not act due to the fear of trying something new and being judged by their neighbours. This shows that fitting in can be a powerful driver for taking action. In response to this, an engaging national television programme was rolled out which role modelled communities taking action together in order to normalise the behaviour. It was found that forty seven (47%) percent of viewers took action after watching the programme [18].

2.2. Technology in place

For effective risk communication, technology needs to be in place together with an early warning system. The first step in warning system design is to define what actions end users should take. The second step is to identify different segments of the target population and how they differ in terms of their abilities to receive a warning and how this may impact their ability to comprehend and act on the early warning. The third step is to identify the channels through which warning messages will be transmitted to different target audiences, considering what technologies and intermediate sources are needed. Finally, warning system designers must define which sources will be most trusted when conveying information. Some sources may have immediate credibility while others require a long-term approach to develop their perceived credibility by taking steps to demonstrate their expertise and trustworthiness.

2.3. Collective risk thinking

There needs to be more consideration of how to make the risks associated with COVID-19 meaningful, and how to communicate them in a way people can understand. For example, an 80-year-old is 1000 times more likely to die from COVID-19 than a 20-year-old. There is a need to go beyond individual risk and to think of collective risk. Collective risk thinking needs to be the main objective where a catastrophic risk is modelled to a single citizen behaviour. This crisis has served as a wake-up call for the importance of improving how we talk and think about risk.

2.4. Community engagement

Risk communication is not always about convincing people to act in a certain way. Care must be taken to avoid placing undue blame or burden on vulnerable groups in relation to taking action, especially when they have limited power, when it’s unclear what actions should be taken, and when ultimately structural factors are putting them in harm’s way. It is important to hold open and public conversations about uncertainty, complicated decisions, trade-offs, and responsibilities which are often overlooked as a part of risk communication.

2.5. Media engagement

The media has the potential to communicate about risk at scale, yet funding and capacity levels can impact their ability to do so effectively. If technical experts, media professionals, and governments work together to provide open and transparent disaster risk information, risk communication can be improved, enabling productive public dialogue among
populations and high-level decision makers, based on accurate and relatable information.

2.6. Trust-building in risk communication

For the public to act on warnings and follow guidance, it is essential that people perceive the source as trustworthy. Indeed, in the countries that have managed the COVID-19 crisis most effectively the public holds high levels of trust in their government. Trust-building is a long-term process. Governments and development organisations must invest in the ‘currency of trust’ before it is needed at a time of crisis. Even in the midst of a pandemic, however, it is not too late for governments to build trust by exhibiting transparency and by seeking to engage with communities.

For governments that have a trust deficit or where the government’s administrative reach is limited to certain areas of the country, it is essential that partnerships and networks with trusted intermediaries are built. These trusted intermediaries can be civil society organisations, religious organisations, local leaders, celebrities, or others. This has been the experience in the Pacific where civil society organisations have been at the forefront of citizen and community engagement. They delivered appropriate risk information by leveraging the trust they built with the communities to manage difficult real-world dilemmas. For example, in Fiji and the Solomon Islands, Oxfam was able to fact-check, facilitate, and adapt pandemic risk messages from ministries of health to the communities via established and trusted local networks, including through traditional leaders and faith-based organisations.

2.7. Disinformation and misinformation

Misinformation and disinformation may follow events and developments that are complex to grasp and have proliferated during the COVID-19 outbreak. Just like disaster risk, the problem of misinformation and disinformation will not go away just by giving accurate information. Solving this requires a structural shift: we need public-interest media with credibility in the Pacific where civil society organisations have been at the forefront of citizen and community engagement. They delivered appropriate risk information by leveraging the trust they built with the communities to manage difficult real-world dilemmas. For example, in Fiji and the Solomon Islands, Oxfam was able to fact-check, facilitate, and adapt pandemic risk messages from ministries of health to the communities via established and trusted local networks, including through traditional leaders and faith-based organisations.

Disclaimer

The article does not reflect the official views of the UN.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgement

The authors would like to thank Tonkin + Taylor in partnership with Integrated Research on Disaster Risk (IRDR), Committee on Data (CODATA) of the International Science Council (ISC) for organising the webinar on ‘Should I stay or should I go now? Why communication is the critical component in disaster prevention’ on 13 October 2020. Authors also thank Morgan Lindsay for assisting on the paper editorial and transcript.

References

[1] Hampel J. Different concepts of risk – a challenge for risk communication. International Journal of Medical Microbiology; Proceedings of the VIIIth International Potsdam Symposium on Tick-Borne Diseases (IPS-VIII). 2006;296:5–10.
[2] Haer, T., Botzen, W. J. W., & Aerts, Jeroen C J H. (2016). The effectiveness of flood risk communication strategies and the influence of social networks—Insights from an agent-based model. Environmental Science & Policy, 60, 44–52. //doi.org/10.1016/j.envsci. 2016.03.006
[3] Frewer Lynn, Hunt Steve, Brennan Mary, Kuznetsof Sharron, Ness Mitchell, Rhiton Chris. The views of scientific experts on how the public conceptualise uncertainty. Journal of Risk Research. 2005;6(1):75–85. //doi.org/10.1080/1366987032000047815.
[4] USIOTWS. Concept of operation for tsunami warning system; 2007 [US Indian Ocean Tsunami Warning System Project].
[5] Fakhruddin Bapon. Risk communication for multi-hazard early warning system. https://shnufakhruddin.net/2020/04/09/sinking-swimming-and-surfing-risk-communications-of-uncertainties-of-the-pandemic/; 2020. (Last accessed 12 Nov 2020)
[6] United Nations Office for Disaster Risk Reduction. What is the Sendai Framework for Disaster Risk Reduction? Retrieved from UNDRR, https://www.undrr.org/implementing-sendai-framework/what-sendai-framework; 2020, October 20.
[7] United Nations. Sendai Framework for Disaster Risk Reduction 2015–2030; 2015 [United Nations].
[8] United Nations Development Programme. Five approaches to build functional early warning systems; 2018 [UNDP].
[9] Climate Centre. Early warning must reach the last metre. The last mile is not enough. Retrieved from Climate Centre https://climatecentre.org/news/144/a-early-warning-must-reach-the-last-metre-the-last-mile-is-not-enough; 2019, May 15.
[10] Habib A, Shahidullah M, Ahmed D. The Bangladesh cyclone preparedness program; 2012 [A vital component of the nation’s multi-hazard early warning system. Institutional Partnerships in Multi-Hazard Early Warning Systems].
[11] Selamet J. Identifying criteria for designing risk communication system in Palu, Sulawesi. Journal of Disaster Research: Indonesia; 2019.
[12] Hopkins John. Global health security index - building collective action and accountability. John Hopkins Bloomberg School of Public Health; 2019.
[13] World Health Organization. WHO coronavirus disease (COVID-19) dashboard. Retrieved from World Health Organization https://covid19.who.int/; 2020, October 20.
[14] Wittenberg-Cox A. What do countries with the best coronavirus responses have in common? Women leaders. Available from: Forbes; 2020, April 13https://www.forbes.com/sites/avahwittenbergcox/2020/04/13/what-do-countries-with-the-best-coronavirus-responses-have-in-common-women-leaders/#16bffec0dfec.
[15] World Health Organization. Universal health coverage. Retrieved from World Health Organization https://www.who.int/en/news-room/fact-sheets/detail/universal-health-coverage-(uhc); 2020, October 20.
[16] National Research Council (US) Committee. Improving risk communication. National Academies Press; 1989.
[17] NOAA Social Science Committee. Risk communication and behavior. NOAA; 2016.
[18] BBC Media Action. Building resilience: How research has been used to develop and evaluate a media and communication approach. Retrieved from BBC Media Action https://dataportal.bbcmediation.org/site/assets/uploads/2016/07/Building-Resilience-research-report.pdf; July 2017. (Last accessed 16 October 2020).
[19] Fakhruddin Bapon. Risk Communication for Cyclone Early Warning - Do people get the message, and understand what it means for them? https://hepex.inrae.fr/risk-communication-for-cyclone-early-warning/; 2018. (Accessed 20 September 2020).