AN EVIDENCE-BASED APPROACH FOR SUPPORTING SCIENTISTS COMMUNICATING EARTHQUAKE FORECASTS

Presenting author: Sara K. McBride, Ph.D., Mendenhall Fellow, Western Geographic Science Center, USGS

Co-Authors: Anne Wein, USGS, Julia Becker, GNS Science, Sally Potter, GNS Science, Emma E. Hudson-Doyle, Massey University
ABOUT THE RESEARCH

• Purpose:
  • To develop information, based on preferences and attitudes of participants, to assist more effective communication of operational earthquake forecasts (earthquake forecasts).
  • Participants: scientists who are (1) preparing to communicate earthquake forecasts, (2) engaging in crisis communications during response, and/or (3) partaking in risk communication for recovery decisions.
  • This study’s direction is supported by best-practice guidance for communication, which strongly suggests that audiences be involved in the creation of information and materials that directly affect them.
  • Communication researchers “practicing what we preach”.

FINDINGS

• Messaging research: respondents most wanted to know a) how different audiences used aftershock forecasts b) what messages were most effective in encouraging protective action and c) how to work more effectively with broadcast media.

• Preferred channels: Scientists want checklists during responses so they do not forget or overlook important aspects of crisis communication.

• Training: all respondents indicated the value of training as an important part of preparedness.

• Improvements: all respondents wanted better maps and infographic elements for the forecasts. Guidance on wording is also valued.

• These checklists should be part of a larger document that points to research as to why these suggested approaches are successful.
BACKGROUND: U.S.A.

- Few urban damaging earthquakes since 1994 Northridge or 2001 M6.8 Nisqually/M 6.0 Napa etc…)
- Few prolonged earthquake sequences
- 10 earthquake advisories issues by CEPAC (California Earthquake Prediction Evaluation Council) since 1985 (roeloffs and goltz, 2016).
BACKGROUND: NEW ZEALAND

Figure One: Timeline of geological events of interest in New Zealand from 2007 – 2016.
METHOD

• SurveyMonkey used to distribute instrument.

• Reasoning
  • level of anonymity, difficult to achieve with smaller group.
  • ability for respondents to provide feedback in their own time

• Respondents - 12 were distributed, eight total respondents (four in U.S.A., four in N.Z.)

• Low risk ethics approval from Massey University (N.Z. form of Internal Review Board).
RESULTS

• Q. 1 – 3. The first section of the survey was focused on determining the level of experience scientists had in communicating during earthquakes. All respondents answered that they had communicated on behalf of their agencies.

• Most respondents indicated they had worked on 4-6 large, damaging earthquakes.
For earthquake communication, what kinds of guidance would you find useful?

Answered: 7    Skipped: 0

- How people are affected by earthquakes and implications for communication
- The characteristics of effective messages to encourage people to protect themselves
- What communication channels different audiences use after an earthquake
- Types of information that different audiences request
- How different audiences understand and use earthquake forecasts
- Communication priorities for different audience
- How to work with the media
- Observed communication challenges and their potential solutions, from both practical
- How to expand communication capacity to meet increased demands
- Other (please specify)
Q. 5: What information was most requested by the following groups in the immediate aftermath of the earthquake (note: if you have not yet responded to a damaging earthquake, you can still provide answers based on your understanding of what responses may be required):

- basic details (location, depth, magnitude)
- past events in the area. Aftershock forecasts were most requested by emergency managers and building engineers, as well as media. Infrastructure damage questions were asked the most frequently by media.
- Peak ground acceleration was asked the most frequently by building engineers and lifelines infrastructure groups.
- Less popular information requests included information regarding tsunami warnings and damage estimates.

We note that these scientists may be less focused on communicating tsunami and damaging information because they do not specialize in these topic areas.
PREPARING FOR RESPONSE

Q. 6: What has helped you the most to prepare for communicating science during response and recovery?

- Training and experience were cited as the most important parts of preparing for response and recovery:

  • Practice and training
  • Being provided with sufficient scientific background material before the interview
  • Having a clear up-to-date set of talking points prepared by my organization and others
  • Prior experience makes it easier each time
  • Having a lot of experience talking to the media on other issues
  • Watching other scientists communicate effectively, and past experience with media interviews.
EXPERIENCE – WHAT WORKS

Q. 7 If you were training another scientist to respond to a damaging earthquake, based on your experience, what advice would you give?

• Keep calm, do what you can, be honest.

• Gather "talking points" Be human (compassionate), be honest, stay within one's area of expertise and don't speculate about others' areas of expertise.

• Be empathetic, engaged, and helpful. Be careful not to go outside your area of expertise.

• Try to separate the people doing analysis and data gathering from those who are answering questions. That way answering questions doesn't [sic] impeded the analysis and developing new and more informed answers.

• First assemble all the basic information. But don't be dragged into speculation about things you don't know about.

• Empathy and compassion were two themes; this is supported by the literature [12, 14, 15]. Speculation and “talking outside knowledge” was a concern among respondents [16, 17].
Q.101 Which types of information do you think would be the most useful when communicating about an earthquake in the following different contexts? (e.g. preparing for communication, crisis communication, and risk communication):

- Checklists were the number one preferred method of information provided to the scientist about communication during an emergency.
- Other answers included: standard operating procedures (SOPs), written guidelines with supporting literature, and more training.
LIMITATIONS AND OPPORTUNITIES

• Very small study size.
• Survey tool
• Ethics
• Exploratory rather than explanatory.
• Survey instrument could be used post emergency as a debriefing tool to gather learnings from other scientists.
CONCLUSION

• For crisis response, scientists want quick and easy to understand check lists.

• These checklists are useful if organized by audience type e.g. building engineers, emergency managers, affected publics, vested publics.

• In times of preparing for and recovering from an earthquake, more information is useful.

• Training is an important component of communicating.
QUESTIONS? THANK YOU.

• skmcbride@usgs.gov
REFERENCES