Communications in the Aftermath of a Major Earthquake: Bringing Science to Citizens to Promote Recovery

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ABSTRACT

In the immediate and early aftermath of a geological disaster, one major goal of communications by geoscientists should be to provide information that will help those impacted make safe and healthy behavioral choices. This requires moving from answers geared exclusively to the domain of physical science and embracing the art and science of risk and crisis communication. The messages should provide a sense of safety, calming, self- and community efficacy, connectedness, and hope. This paper suggests ideas and strategies drawn from the literature of disaster communications and from our own personal experience. We also propose a model draft message to be delivered in the immediate aftermath of an earthquake disaster.

INTRODUCTION

A sizeable earthquake has just happened, the phone rings and you are interviewed live. What should you say?

In the immediate and early aftermath of a geological disaster, one major goal of communications by geoscientists should be to provide information that will help those impacted make safe and healthy behavioral choices. In so doing, these scientists not only promote safety, but also assist in the beginning of the recovery process. Because of the intense media attention in the aftermath of a geological disaster, geoscientists are in an ideal position to deliver needed, and even life-saving, information to the general public, to those most at risk, and to response and recovery personnel. If geoscientists are prepared to provide information in a way that people are able to process and utilize, people can behave in ways that safeguard the health of themselves and their loved ones.

For geoscientists, this involves moving from answers geared exclusively to the domain of physical science and embracing the art and science of risk and crisis communication. Using this approach accomplishes at least two goals: the reduction of adverse residual psychosocial impact and the increase in likelihood that people will make choices and decisions that enhance individual and public health. In the immediate postevent period, information is a psychosocial intervention: it can increase or decrease adverse psychosocial impact. In many, if not most disasters, anxiety and other behavioral health consequences are the most pervasive, long-lasting, and costly health effects. By combining geoscientific expertise with skills in communication, scientists can provide comfort and relief to those exposed in ways few of us have considered. “Better than any medication we know, information treats anxiety in a crisis” (Saathoff and Everly, 2002).

Typically, in most disasters, those most directly exposed to the event experience the most significant psychosocial impact. For these directly affected persons, an earthquake presents many characteristics of highly stressful events: no warning, potentially dangerous, unpredictable, unusual (for most), and filled with unknowns (duration, intensity, frequency, potential for damage, and injuries). Clearly, the population of a shocked region needs special attention and information in the early aftermath of an earthquake. For these reasons, messages directed at the shocked population should be practical in nature and provide information on health and safety concerns and safety directives. At the same time, it is important to remember that those outside the physically impacted area often can experience significant adverse psychological impact from factors such as their connections with loved ones in the affected area or their prior experiences with trauma.

In the sections below, we suggest communication ideas based on the available literature on the topic of disaster communications as well as personal postearthquake experiences (Lamontagne et al., 1992; Minnick, 2010). It is likely that many of these suggestions also apply to early postdisaster
periods of other natural hazards such as volcanic eruptions, landslides, floods, and hurricanes. For the purposes of this article, we have chosen to focus on the findings of a seminal meta-analysis of the literature on the efficacy of early psychosocial interventions (ranging from hours to several months postevent) following a crisis authored by Hobfoll et al. (2007). That article identifies five characteristics of early interventions that seem to be helpful. These interventions tend to be the ones that provide a sense of safety, calming, a sense of self- and community efficacy, connectedness, and hope. The field of disaster behavioral health has largely embraced these findings and is developing early intervention strategies consistent with these elements. Psychological first aid is a growing approach that tends to incorporate these types of elements.

COMMUNICATING WITH PEOPLE UNDER HIGH STRESS

After a major event, people may be under high stress and for this reason may process information differently than under less-stressful circumstances (Covello, 2011).
1. People accept messages more readily when they include elements of compassion, commitment, and optimism (CCO).
2. People tend to focus more on negative information (“There will be another earthquake”) than positive (“Buildings are designed to resist earthquakes”). Generally, one negative message has an impact similar to three positive.
3. People can remember fewer items than normal (typically only—three to five).
4. People tend to best remember the first thing they hear (primacy), followed by the last (recency), and finally, material in between.
5. In the immediate aftermath of an event, clear and short messages are most effective. Research has shown that the best ones use no more than 27 words, delivered in no more than 9 seconds, and contain no more than three messages (the 27/9/3 approach).

Although Covello (2011) describes these templates as elements in a single message or set of individual messages, the focus on CCO can provide a useful organizing principle for geoscientists as they anticipate both what they say and what they do in the postevent period.

COMPASSION, COMMITMENT, OPTIMISM (CCO)

It is advantageous for geoscientists to become skilled at delivering messages to the general public (a much different audience than their typical audience). Scientists need to be able to move from a more academic way of communicating (how they were typically trained) to a more personal, spontaneous, and empathetic way of communicating. In most scientific and academic settings, credibility is heavily influenced by academic credentials; for the public, credibility will arise from our capacity to connect to the reality of people’s lives and experience. People under stress will better accept communications that include the elements of compassion (understanding what the audience is experiencing), commitment (assuring what you will do/what will be done), and optimism (things will get better). Will Rogers is reported to have said, “People want to know that you care before they care what you know.” Storytelling with personal references supports and reinforces the science, and it helps make the information more psychologically accessible to citizens.

MAINTAINING CONTACT WITH THE SHOCKED POPULATION

Direct contact between the public and geoscientists can have a positive impact especially if the scientist is skilled in communicating in high-stress situations. Scientists can greatly reduce the unknown, and enhance credibility, by explaining basic phenomena in simple terms, but without hiding the intrinsic limitations of geoscientific knowledge.

For days or weeks after a major shock, continuous contact with the public needs to be maintained with the help of communications or public affairs specialist. Information specialists can provide general information on earthquakes, progress reports on field investigations such as the recording of aftershocks, and daily news items to prevent unfounded rumors that inevitably arise from an absence of news. They can also insure a continuous presence through the use of social media. This individual needs to work in coordination with the team of scientists with whom internal briefings are held at regular intervals. Having a consistent credible face/voice providing information implies commitment and is reassuring.

If a field survey is taking place, direct contact (e.g., public presentations, outreach activities) between the public and geoscientists can have a positive impact. In these activities, visual material (such as simplified and visually attractive diagrams and models) appears to have a greater psychosocial impact than verbal information (Mileti and Peek, 2002). The emphasis should not be on pictures of damage, but rather on positive actions that people can take to reduce their vulnerability. Written material understandable at low reading and comprehension levels and in appropriate languages should be available. For group meetings, simplified and visually attractive diagrams can help make difficult concepts and processes (such as plate tectonics and depth of earthquakes) easier to understand. Audiovisual material (photos, animations, videos) and scale models should be developed to illustrate earthquake processes, earthquake impacts, and emergency preparedness concepts before an event occurs. For days after the event, updates should be provided on new events such as aftershocks, field investigations, and daily news items. In our age of electronic communication, many possibilities of maintaining contact with the population exist. The ideal situation would have pre-existing links with local groups, the media and emergency organizations prior to an event.

SENDING A POSITIVE MESSAGE TO EMPOWER THE PUBLIC

In the first few hours after the earthquake, the shocked population needs factual information as well as practical advice.
In the early hours of an emergency, people seek answers to these three questions: (1) Am I OK? (2) What about those I love? (3) What should I do? Geoscientists can help provide information regarding the latter, including explanations on what happened. Encouraging positive action on behalf of one’s self, family, and community is in itself a stress reliever and promotes optimism. Action reduces the sense of helplessness and promotes a sense of self-efficacy, a significant step in physical and psychosocial recovery. Messages might also include some additional preparedness actions that help people move from feeling like a victim to being a survivor, having some control of their lives and destiny. Reminding people of some actions they can take to reduce their vulnerability (removing hanging objects, acquiring a flashlight) can get people to be active rather than passive. Gaining a sense of control over one’s destiny in the face of a powerful event is a significant step on the road to physical and psychosocial recovery. In addition, geoscientists can bring relief to people by reassuring them about the normality of their reactions, by validating their experience, providing basic information, encouraging them to talk with members of their social network and supporting individual, family, and neighborhood/community emergency preparedness measures.

THE COMMUNICATIONS CHALLENGES

For geoscientists, addressing topics such as aftershocks, seismic resistance of buildings, misconceptions, and unfounded rumors constitute some of the many communication challenges. Aftershocks must be addressed in messages that geoscientists traditionally deliver in the aftermath of a strongly felt earthquake. Aftershocks extend the period when the already shocked population is stressed by felt or potential aftershocks. Because stress is cumulative, the seemingly never-ending earthquake crisis can extend and intensify stress over an extended period. The stress induced by these aftershocks, real or potential, can even lead some people to consider leaving the epicentral region as happened in the Christchurch earthquake crisis (New Zealand Herald, 29 February 2012). Earth scientists cannot prevent (or predict) aftershocks, but they can provide information on what they mean and correct misconceptions (such as the myth that earthquakes can be predicted). “When reliable information is not available, rumor fills the gap” (Miletí and Peek, 2002). To stop disruptive rumors, scientists should remind the public that the exact dates and times of each event cannot be accurately forecasted. Seismologists can help by reminding people that for aftershocks, as for mainshocks, the usual individual protective actions apply.

In today’s world, everyone is but a few key strokes away on the Internet. In the days following an event, there will be intense media coverage available through many venues. Unfortunately the coverage is not always accurate and helpful. Many will claim subject matter expertise—founded or not. You may have to explain why the “Triangle of life” myth is considered dangerous and is not recommended. Hopefully, legitimate emergency organizations will use credible leadership in most aspects of disaster communications based on authoritative information from geoscientists.

Another key message for geoscientists is that most developed countries have earthquake-resistant standards in building codes, intended to protect buildings from collapse and save people’s lives. This fact is not widely known and for this reason, many people prefer to run outside during an earthquake instead of following the “duck, cover, and hold” recommended practice. It can be important to remind people to improve the earthquake resistance of their residences and offices, and of these buildings’ contents.

The media and the general public may underestimate the uncertainties of the Earth sciences. Some may expect geoscientists to erase the unknowns about earthquakes and seek reassurance by definitive, even if inaccurate, statements. Knowing these potential misconceptions, geoscientists can craft their communications to address these false beliefs and provide accurate and sensitive information. For this, and other good reasons, pre-event relationships with the media can help promote accurate expectations and reduce frustration and misunderstanding in a real event. These relationships may also help reduce the impact of rumors created by nonspecialists. It is crucial to keep local media and local collaborators informed in order to decrease the risk of erroneous comments, which can confuse the public and increase stress.

CRAFTING A MESSAGE WITH MAXIMUM POSITIVE IMPACT

Based on the best practices described above, we are proposing a predefined message (Appendix 1). This example of a message uses the 27/9/3 approach as the introductory remarks. If more time is available, the rest of the message can be read. We have tried to use a tone that considers the cognitive and emotional state of message recipients possibly stressed by a sizeable recent event.

CONCLUSIONS

Earth scientists are not first responders. However, through their knowledge and credibility, they can play an active and important part in the early response and recovery phases of a geological disaster. By providing usable and accurate information to populations most affected, they can play a key role in reducing psychosocial stress. This article encourages geoscientists to be ready to accept the challenge, to recognize the diverse needs of the local population, and to adapt their communications to serve the public in expanded and enhanced ways. Geoscientists can send positive and useful messages that will not only contribute their scientific knowledge, but their commitment to, and compassion for, the affected population. Even when a moderate earthquake is felt, geoscientists can establish their credibility and apply their knowledge so that when a larger disaster strikes, they can exert a positive influence on physical and psychosocial recovery for individual, families, communities, and nations. This article provides information
that can be used to bring science to people who can use the science.

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REFERENCES


APPENDIX 1

SUGGESTION OF A MESSAGE THAT COULD BE DELIVERED MINUTES AFTER A POTENTIALLY DAMAGING EARTHQUAKE

Primary Message

My name is *** and I am a seismologist with ***.

A few minutes ago, we all felt an earthquake that was frightening to many of us. The next few hours will be demanding for all of us as we may feel aftershocks. By caring for ourselves and others, we will overcome this difficult period as has been done in the past in many regions.

Additional Information

A few minutes ago, strong vibrations were felt and were produced by an earthquake of magnitude *** located some *** km from ***. An earthquake of this size can cause damage to houses and buildings many tens of kilometers from the epicenter. In the hours to come, we may hear of damage from various localities.

During the strong vibrations of that earthquake, you may even have feared for your own life or one of your loved ones. You may currently feel confused, anxious, or powerless. These reactions are normal, because large earthquakes are very uncommon events.

The next few hours may be stressful for all of us. You may have felt aftershocks already. We can, however, get through this difficult period, as many other people have in past earthquakes. Here is some information that you may find useful:

- If you can, please verify if people around you need help. If you are qualified in first aid measures, do what you can or at least let the injured know that you are present with them. In the case of serious injuries, call 911 or leave a sign outside requesting help. If you need to use the phone, it is possible that the phone lines may be overloaded or down. If so, do not hang up; the line could eventually be freed. Texting may still work on the cell phone.
- If you have children, stay with them, asking them how they feel. Reassure them that it is going to be all right: they are counting on you for comforting verbal and non-verbal messages.
- Do not forget about yourself: take care of yourself by taking breaks from time to time. These times are stressful and demanding.
- If you inspect your home or building and find that it does not look safe, there is a good chance that it is not safe. We recommend that you evacuate the building and stay away from a damaged building until a knowledgeable person inspects it and declares it safe. If inside a building, avoid using elevators; use stairwells if they have been declared safe.
- Be careful if you need to walk around debris, especially broken glass. Stay away from fallen power lines, and evacuate buildings if you fear the presence of a gas leak. Unless it is necessary, stay away from damaged areas for your safety and to give priority access to emergency responders. If you can avoid driving, do not drive.
- If you live near the epicenter of the earthquake, it is probable that you have already felt or will feel aftershocks during the next few hours. These additional earthquakes are normal and are caused by the Earth’s crust trying to re-balance itself. Aftershocks are usually smaller than the original earthquake and become less frequent with time.
- Some of these aftershocks may be felt. If they are strong enough, they can make some objects fall or add to the damage. You can lessen their potential impact by displacing objects that could fall. Remember, during an earthquake, protect yourself by dropping to the floor (ground), taking cover under something sturdy, covering your head and neck with your arms, and holding onto what you have taken cover under, so it does not dance away on you. Drop, cover, and hold on.
- Our organization is monitoring the earthquake situation and will issue updates. You can listen to this station or visit our website, earthquakescanada.ca, where updates will be posted.
By listening to the radio, you will be able to get more information on measures to take from emergency organizations. You can visit the website, getprepared.gc.ca, for additional information.

If the earthquake occurred offshore or near coast: As this earthquake occurred offshore, it is recommended that you move to higher ground away from the seashore. If you notice that the sea recedes rapidly, go quickly to higher ground, away from the shore, for the next few hours. Stay tuned for information from emergency organizations.

APPENDIX 2

EXAMPLES OF TEXT THAT COULD BE ADDED AT THE BEGINNING OF A SLIDE PRESENTATION TO IMPACTED PEOPLE

Slide 1: Earthquakes
Earthquakes are a Natural Geological Process.

For human beings:
A threatening phenomenon (potentially destructive) can lead to fear because
1. it is mysterious;
2. it occurs without warning; and
3. it questions what we consider solid (the Earth under our feet, our houses).

Slide 2. What you may currently feel:
Fear, anxiety, stress

- These reactions are normal, because earthquakes can be threatening.
- This earthquake was a large one, and it is very unusual to feel one like that.

Slide 3. Today’s talk
1. Description of what happened.
2. What can be expected in the next few days, weeks, years?
3. What you can do about the situation.

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