Tools and Techniques for Effective Message Mapping and Radiological Risk Communications with the Public During Radiological Emergencies.

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Abstract: Message development skills are critical to successful radiological risk communication to the public, the media, and other stakeholders. Message development skills are particularly critical to successful emergency communications with those living in close proximity to a nuclear power plant. This paper contains principles, strategies, and tools for producing messages before, during, and after a radiological emergency that are understandable, timely, accurate, consistent, and credible. The document paper lists a number of questions the public and media may ask during a radiological emergency. The paper describes one of the most important tools for message development: the message map. Message maps are used by a large number of public and private sector organizations. Message maps are risk communication tools used to help organize complex information and make it easier to express current knowledge. Message mapping is a science-based message development process by which users can:

- anticipate questions of stakeholders (interested, affected, or influential parties) before they are raised;
- decide what questions they want or need to answer and what questions should be answered by other organizations;
- develop responses to stakeholder questions in a clear, concise, and accessible format;
- promote dialogue about messages both inside and outside the organization;
- provide spokespersons with a user-friendly guide to a set of vetted organizational messages;
- ensure the organization has consistent messages;
- ensure the organization speaks with a single voice or with many voices in harmony.

Key Words: Risk communications, emergency planning, message map, key message, supporting information.

Text: When disaster occurs one of the most important things to do, from the first moments of the disaster, through to the end, is “communicate, communicate, and communicate.” This seems so obvious, yet many people, during a crisis, appear to be unable to effectively communicate the risk of the event, what harm has occurred, what harm may occur, and what actions must be taken to ensure safety of the public.

The paper provides guidance on effective message development for radiological emergencies. Message development skills are particularly critical to successful risk communication with members of the public. The most successful messages are often those that were prepared in advance of an event and modified for use at the actual time of the event.

This paper focuses on one of the most important tools for message development: the message map. Message maps are "risk communication tools used to help organize complex information and make it easier to express current knowledge."' Message mapping is "a science-based risk communication tool that enables members of the emergency response and environmental protection communities to quickly and concisely deliver the most pertinent information about an emergency."

Message maps are sets of organized statements or messages that address likely questions and concerns in an emergency. Each map identifies up to three to four unique messages that address a specific question or concern. Each message can be expanded with several layers of supporting information. Message mapping distills information into easily understood messages.

Communicating clearly, especially in the first few hours of an emergency, can save lives. Message maps are particularly helpful in radiological emergencies. Communication during a radiological emergency must be timely, clear, accurate, and frequent. This can best be accomplished by having template radiological risk communication products readily available that can be modified as needed at the time of the event. Message maps can serve as one of these template products. Since the message maps can be prepared in advance, they can also be approved in advance, saving valuable time during an event.

Message mapping has become widely accepted by emergency responders as a method of preparing, ahead of time, responses to questions frequently asked by interested or affected parties (stakeholders) during emergencies and crises. In recent years, in the United States, numerous U.S government agencies and private sector organizations have sponsored message mapping workshops and exercises focusing on different types of risks and emergencies.

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Message mapping should be a central element in radiological emergency risk communication planning. The message maps included in an emergency risk communication plan allow for a proactive, quick, and effective response during a radiological emergency. One advantage of a having a written emergency risk communication plan containing message maps is that many of the necessary communication decisions and activities in a radiological emergency will have already been decided. If carefully designed, an emergency risk communication plan containing message maps can save precious time when an emergency occurs. It enables leaders and spokespersons to focus on the specifics of the emergency at hand. An emergency risk communication plan containing message maps can also improve the quality, accuracy, and speed of responses to questions from the public, the media, and other stakeholders.

Message maps are tools for communicating information about any type of emergency. They ensure that risk information has the optimum chance of being heard, understood, and remembered. Message maps allow organizations to convey timely, accurate, clear, and credible information.

One goal of message mapping for radiological emergencies is to help the affected nuclear power plant licensee and off site emergency response organizations establish themselves as

the go-to source for information from the outset. They enable audiences to -better understand issues, act constructively upon the information provided, recover more quickly from the stress of the event, and gain or regain trust in risk managers.

Message maps present concise, detailed, and hierarchically organized responses to anticipated questions or concerns. They serve as visual aids that can highlight, at a glance, the organization's messages for key issues of concern.

As shown in the message map template below the top portion of a message map identifies the issue, the stakeholder (the intended audience), and the specific question or concern the map is intended to address. The next layer of the message map contains the key messages in response to the question. Key messages are intended to address, in a concise form, the information needs of the key stakeholder or audience. The key messages can also serve as the basis for various risk communication products. For example, key messages can serve singularly or collectively as media talking points or sound bites (a very short comment or phrase suitable for use in a broadcast or print news story). When properly used by trained spokespersons, talking points and sound bites are critical to successful media interviews. However, the key messages contained in a message map differ substantially from traditional media talking points. The construction of key messages in a message map follows a strict and exacting research-based discipline regarding the number and content of the messages. The bottom tier of the message map contains supporting information, blocked in groups under the key messages. Supporting messages amplify the key messages. They provide additional facts, details, explanations, credible third part support, or graphics.

Sample Message Map for a Radiological Emergency

Stakeholder: The Public		
Question or Concern: What should I do if I think I may have been contaminated?		
Key Message 1	**Key Message 2**	**Key Message 3**
Stay informed.	Remove your clothes.	Wash yourself and your valuables.
Supporting Information 1-1	**Supporting Information 2-1**	**Supporting Information 3-1**
Listen to your local Emergency Alert System and public safety officials on radio, TV or internet.	Place the clothing in a plastic bag and seal it.	Take a long shower or clean yourself thoroughly using lots of soap and water. Be careful not to scratch or irritate your skin while washing.
Supporting Information 1-2	**Supporting Information 2-2**	**Supporting Information 3-2**
Act promptly on the guidance from local public health officials.	Place the bag as far away as possible from humans and animals.	Gently blow your nose and washout your eyes, ears, and mouth.

Supporting Information 1-3	Supporting Information 2-3	Supporting Information 3-3
Visit [Insert relevant website address] for continued updates.	Bagged clothing can be examined later to determine if you were contaminated.	Wash valuables and identification that may have been contaminated; wash your hands again.

Supporting information is often needed for the key messages, especially if the topic is complex. Additional Supporting Information can be provided in attached pages containing footnotes, citations to credible third parties, graphics, maps, video links, or hyperlinks.)

Message mapping is an important tool in effective risk communication. Effective risk communication establishes public confidence in the ability of an organization to deal with a risk.

In the United States of America, The National Research Council/National Academy of Sciences has defined risk –communication as "an interactive process of exchange of information and opinion among individuals, groups, and institutions." Numerous studies have highlighted the importance of effective risk communication in enabling people to make informed choices and participate in deciding how risks should be managed. Effective risk communication provides people with timely, accurate, clear, objective, consistent and complete risk information. It is the starting point for creating an informed population that is:

- involved, interested, reasonable, thoughtful, solution-oriented, cooperative, and collaborative;
- appropriately concerned about the risk;
- More likely to engage in appropriate behaviors.

Effective risk communication is critical during a radiological emergency. For example, under normal circumstances, the elaborate infrastructures and mechanisms that protect nuclear power plants generally go unnoticed. However, as was seen during the Fukushima incident, when there is loss of coolant and releases of radiological materials, there is intense interest in all of these things.

The primary objectives of effective risk communication before, during, and after an emergency are to:

- build, strengthen, or repair trust;
- educate and inform people about risks;
- build consensus or encourage dialogue about appropriate actions to take in the event of an emergency;
- raise community awareness of plans for responding to an emergency;
- disseminate educational information on actions people should take before, during, and after an emergency;
- encourage people to take appropriate actions during and after an emergency."

Risk communication during a radiological emergency will directly influence events. Poor risk communication can fan emotions and undermine public trust and confidence. At worst, poor risk communication can create stress, conflict, and additional crises. For example, in the United States during the early days of the Fukushima Dai'ichi disaster, there was a heavy demand for stable iodine tablets throughout the country. This demand was created in large measure by lack

of reliable communication by trusted US government officials; i.e., when asked, “U.S. Surgeon General Regina Benjamin said… stocking up is not an overreaction and it is right to be prepared as a precaution - in contrast to guidance from state officials.” After the Surgeon General’s remarks, there was a run on stable iodine products.

Good risk communication can rally support, calm a nervous public, provide needed information, encourage cooperative behaviors, and potentially help save lives.

Effective risk communication is a key responsibility of nuclear power plant licensees and offsite response organizations before, during, and after a radiological emergency. For example, during a radiological emergency, the public, news media, policy-makers, and other stakeholders will demand timely, accurate, and quality information from the affected nuclear power plant, regulatory agencies, public officials, and other authorities about the situation. A spokesperson who communicates badly may be perceived as incompetent, uncaring, or dishonest, thus losing trust. One who communicates well, however, can reach large numbers of people with clear and credible health, safety, and security messages.

While the specifics of a radiological emergency are difficult to predict in advance, risk communication strategies for such events can be planned before the emergency occurs. Such planning greatly increases the likelihood that communication will contribute positively to emergency response efforts. Well-constructed, practiced, and delivered messages will inform the public, reduce misinformation, and provide a valuable foundation for informed decision making. Although many of the principles of risk communication involve elements of common sense, the principles are supported by a considerable body of scientific research.

One of the main principles of risk communication indicates that when people are highly upset, they often have difficulty hearing, understanding, and remembering information. Research shows the mental stress caused by exposure to real or perceived risks can significantly reduce a person’s ability to process information. Factors that cause the highest levels of worry, anxiety, and mental stress during an emergency include, but are not limited to, perceptions that:

- The situation is under the control of others, especially those that are not trusted;
- The situation is involuntary;
- The situation is inescapable;
- The emergency is of human origin versus natural origin;
- The emergency involves a type of risk that is unfamiliar or exotic;
- The emergency threatens a form of injury or death that is dreaded;
- The emergency is characterized by a great deal of uncertainty;
- The emergency is likely to cause injury or death to children, pregnant women, or other vulnerable populations.

The challenge for risk communicators is to overcome the communication barriers created by such anxiety provoking factors.

As a strategic tool, a message map affords multiple benefits. For example, message maps:

- provide a handy reference for emergency response leaders and spokespersons who must respond swiftly to questions on topics where timeliness and accuracy are critical;
- allow multiple spokespersons to work from the same set of messages to ensure rapid dissemination;
- allow multiple spokespersons to provide consistent messages across a wide spectrum of communication outlets;

- provide a unifying framework for disseminating information about a wide range of radiological issues;
- prevent omissions of key facts or misstatements that could provoke misunderstandings or controversy.

Perhaps most importantly, message maps can be used for public education efforts prior to a radiological emergency. They can be used as the basis for information forums, community meetings, open houses, Web sites, video scripts, fact sheets, pamphlets, mailing inserts, fliers, billboards, teacher packets, radio and TV talk shows, direct mailings, personal visits, brochures, and feeds to social media outlets. They can also be used to produce new educational materials or improve enhance existing educational materials.

There are six steps involved in the message mapping process.

1. Identify Potential Stakeholders
2. Identify Stakeholder Questions
3. Develop Key Messages
4. Develop Supporting Facts
5. Test and Practice Messages
6. Deliver Message Maps Through the Appropriate Information Channels

The most important factor in the preparation of message maps is to meet target audience needs, " the higher the level of stress, fear, or anxiety, the greater the need to simplify the language and to carefully structure messages from simple to more complex." People who receive emergency information typically go through a sequential process that shapes their perceptions and subsequent actions and/or behavior. The sequence is:

(1) hearing and perceiving the risk information;
(2) understanding the risk information;
(3) believing the risk information;
(4) deciding about personal relevance (for example, Will I be affected? Does this apply to me?);
(5) deciding about alternative protective actions in response to the perceived risk;
(6) performing the protective actions.

When crafting message maps, " Adhere to the "primacy/recency" or "first/last" principle by putting the most important messages in the first and last position in lists.

- Provide information that indicates genuine empathy, listening, caring and compassion.
- Use graphics, visual aids, analogies and narratives (such as personal stories).
- Balance negative information with positive, constructive or solution-oriented key messages.
- Repeat messages to reinforce risk perceptions and responses. Frequently repeated messages help to reduce the potential for misperceptions by focusing people on key messages and addressing rumors, and increasing public confidence. However, in protracted emergencies, repetition of unchanged key messages may become counterproductive.

Recognize that trust is critical to effective messaging during an emergency. Under nonstressful circumstances, people base opinions regarding the trustworthiness of a spokesperson largely on competence and expertise. During a crisis, however, people put a high weight on factors

such as empathy, caring, compassion, and active listening. When people are stressed and upset, they typically want to know that you care before they care what you know.

Research has found that there are a finite number of questions that media and others are likely to ask during an emergency condition. These are known as the "77 Questions Journalists Ask During An Emergency." [1] Radiological emergencies are more challenging because the public and the media are not well-informed about the topic. Recent research has found over 400 questions that will be asked during a radiological emergency.

A small sample of these 400 questions is presented here[2]:

Sample Health. Safety, and Mental Health Questions (General)

1. Am I at risk from radiation contamination from the release?
2. What are the risks to my children?
3. What are the risks to my pets?
4. What will be the impact on natural habitats (for example, fish, wildlife, and endangered species)?
5. Can my children and pets play outside?
6. What health effects can I expect to see if I've been exposed to radiation?
7. What are the short-term health effects of exposure to radiation?
8. What are the long-term effects of exposure to radiation?
9. If I develop a health problem (i.e., headaches, rashes, etc.) that I never had before, could the exposure to radiation have caused this problem?
10. Have any health problems been reported so far?
11. How many people have become ill as a result of the release?
12. Are you going to test people for exposure to radiation?
13. How do you test people for radiation exposure?
14. Can people obtain devices for testing radiation exposure?
15. Will people in the Emergency Planning Zone be provided with devices for testing radiation exposure?
16. Have you set up a temporary, local health center or clinic where we can be tested?
17. I'm pregnant (or planning to be). Will exposure to radiation affect my unborn child?
18. Will it be safe to garden in my yard?
19. Will it be safe to eat vegetables grown in my garden?
20. Will it be safe to drink the water from my well?
21. Will you provide us with bottled water?
22. Is it safe to bathe or shower in the water?
23. Is it safe to water our lawns with the potentially contaminated water?
24. Is it safe to mow our lawns if the soil underneath is potentially contaminated?

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[1] Hyer, R. and Covello, V.T. (2007) Effective Media Communication During Public Health Emergencies: A World Health Organization Handbook. Geneva, Switzerland: United Nations. World Health Organization, p. 3.

[2] For a complete list go to USNRC NUREG/CR 7032 Guidance on Developing Effective Radiological Risk Communication Messages: Effective Message Mapping and Risk Communication with the Public in Nuclear Plant Emergency Planning Zones (2011)

25. Is it safe to use the river for fishing and other recreational purposes?
26. Will it be safe to eat the fish caught in rivers and lakes?
27. What's being done right now to protect my own health and that of my family?
28. How long will the affected area be contaminated?
29. How serious is the contamination?
30. What health effects are expected from exposures to different types of radiation?
31. What health effects are expected to the thyroid glands of those exposed to radiation?
32. What health effects are expected to the lungs of those exposed to radiation?
33. What health effects are expected for those who ingest food or liquids contaminated with radiation?
34. Will the authorities be doing long term monitoring for increases in thyroid cancer, leukemia and other cancers among people in affected communities?
35. Is there a vaccine people can take to prevent health effects from exposure to radiation?
36. Can concrete, walls and glass shield people from the health effects of radiation?
37. Are children and pregnant women more susceptible to harm than others from exposure to radiation?
38. Are people with weak immune systems more susceptible to harm than others from exposure to radiation?
39. What should parents be telling their children?
40. What is your advice for people experiencing severe mental anguish or post traumatic stress syndrome from the incident?
41. What should you say to people who [insert risk category, such as people who have lost loved ones, have lost their business, have suffered a financial loss, cannot find families or friends, or witnessed a death or injury)?

Sample Questions about KI (Potassium Iodide)
1. Why should people take KI?
2. Who should take KI?
3. When should people take KI?
4. How much protection from radiation is provided by taking KI?
5. How effective is KI in protecting against radioactive iodine?
6. Do all releases of radioactivity contain radioactive iodine?
7. How does KI protect the thyroid gland?
8. What is the function of the thyroid gland and what will happen if a person does not take KI?
9. Is the taking of potassium iodide approved by the US Food and Drug Administration?
10. Where can people get KI?
11. Does KI require a prescription?
12. Are some forms of KI better than others?
13. Can people drink the iodine used for the cleaning of wounds if they are not able to get hold of KI?
14. Does KI protect again all types of radiation?
15. What are the recommended doses of KI for radiological emergencies involving radioactive iodine?
16. Who determines what the recommended dosage of KI will be?

17. Has the recommended dosage of KI changed over the years?
18. Can KI be taken after exposure to radiation has occurred? Is it still effective?
19. For how long does the recommended dose of KI provide protection?
20. How effective was the KI given to people during the Chernobyl nuclear accident?
21. Should people outside the 10 mile Emergency Planning Zone take KI?
22. Should people outside the 50 mile Emergency Planning Zone take KI?
23. How far can radioactive iodine travel? What dosages of radioactive iodine are harmful?
24. What are the side effects if taking KI?
25. Should pregnant women take KI?

The development of message maps for the 400 plus identified questions is a challenging task. However, the ability to communicate quickly and reliably with stakeholders is not only desirable but it can also save lives. Good preplanning results in good event response.