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Risk communication and message mapping: A new tool for communicating effectively in public health emergencies and disasters

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INTRODUCTION

> "We have had great success in the [last] five years in controlling outbreaks, but we have only recently come to understand that communications are as critical to outbreak control as laboratory analyses or epidemiology."
>
> Dr. Jong-wook Lee, Director General, World Health Organization, September 2004

> "The major public health challenges since 9/11 were not just clinical, epidemiological, technical issues. The major challenges were communications. In fact, as we move into the 21st century, communication may well become the central science of public health practice."
>
> Dr. Edward Baker, US Assistant Surgeon General, December 2001

Until something dramatic goes wrong, such as a terrorist attack or an outbreak of an exotic communicable disease, the elaborate infrastructures and mechanisms that protect public health on a daily basis often go unnoticed. In the heat of a public health emergency, risk communication will directly influence events. Poor risk communication can fan emotions and undermine confidence. Good risk communication can rally support, calm a nervous public, provide needed information, encourage cooperative behaviors, and help save lives.

Effective risk communication is a key responsibility of public health professionals and information officers in emergencies and disasters.[1-7] The public, the news media, policy makers, and other interested and affected parties expect timely quality information from public health officials about the situation. Communicate poorly and you may be perceived as incompetent, uncaring, or dishonest, thus losing trust; communicate well and you can reach large numbers of people with clear and credible public-health messages.[3,5]

While emergencies and disasters are difficult to predict, risk communication strategies for such events can be planned.[5] Such planning greatly increases the likelihood that communications will further public health interests and contribute positively to emergency response efforts. Well-constructed and well-delivered messages will inform the public, reduce misinformation, and provide a valuable foundation for informed decision making.

To communicate effectively during emergencies and disasters, messages must be carefully framed and delivered. One of the most powerful tools available to risk communicators for this purpose is the "message map." A message map is an organized means for displaying layers of information; it is a lens through which principles for effective risk and crisis message development can be focused into effective and powerful communication. A message map contains detailed, hierarchically organized responses to anticipated questions or concerns. It is a visual aid that provides, at a glance, the organization's messages for questions and concerns raised during an emergency or disaster. The message map template enables spokespersons to meet the demands of the public, the media, and other interested parties for timely, accurate, clear, concise, consistent, credible, and relevant information. The information contained

Stakeholder: Question or concern:		
Key message 1	**Key message 2**	**Key message 3**
Supporting information 1-1	**Supporting information 2-1**	**Supporting information 3-1**
Supporting information 1-2	**Supporting information 2-2**	**Supporting information 3-2**
Supporting information 1-3	**Supporting information 2-3**	**Supporting information 3-3**

Figure 1. Message map template.

in the message map contributes to the achievement of the main goals of risk communication: to inform and educate; to gain trust and credibility; and to create informed dialogue, decision making, and behavior.[1-3,8-10]

As shown in Figure 1, a message map is a grid containing multiple boxes. The top portion of the map identifies the audience for the message map as well as the question or concern the message map is intended to address. The next layer of the message map contains the three key messages. These messages function individually and collectively as a response to a stakeholder question or concern. Key messages are intended to address the information needs of a wide variety of audiences. The three key messages can also serve as media sound bites. Sound bites are critical to successful media interviews during emergencies and disasters.

The next tier of the message map contains supporting information. Supporting information is blocked in groups of three under the key messages. Supporting messages amplify the key messages. They provide additional facts or details. Supporting messages can also take the form of visuals, analogies, personal stories, or citations to credible sources of information.

BENEFITS OF USING A MESSAGE MAP

As a strategic tool, a message map affords multiple benefits. It provides a handy reference for leaders and spokespersons who must respond swiftly to questions on topics where timeliness and accuracy are critical. Multiple spokespersons can work from the same message map to ensure rapid dissemination of consistent messages across a wide spectrum of communication outlets. Message maps provide a unifying framework for releasing information about questions and concerns raised during an emergency or disaster.

When used consistently, message maps promote the benefit of multiple partners "speaking with one voice." Message maps also minimize chances of "speaker's regret"—regretting saying something inappropriate or regretting not saying something that should have been said. A printed copy of the message map allows spokespersons, during interviews, to "check off" the message map talking points they want to make, in order of their importance. This helps prevent omissions of key facts or misstatements that could provoke misunderstandings, controversy, or outrage. Message maps also allow organizations to

Stakeholder: General Public **Question or concern:** How contagious is smallpox?		
Key message 1	**Key message 2**	**Key message 3**
Smallpox *spreads slowly* compared to many other diseases.	This allows *time to trace* those who have come in contact with the disease	Those who have been traced *can be vaccinated* to prevent illness
Supporting information 1-1	**Supporting information 2-1**	**Supporting information 3-1**
People are only infectious when the rash appears	The incubation period for the disease is 10 to 14 days	People who have never been vaccinated are the most important to vaccinate
Supporting information 1-2	**Supporting information 2-2**	**Supporting information 3-2**
Smallpox typically requires hours of face-to-face contact	Resources are available for tracing contacts	Adults who were vaccinated as children may still have some immunity
Supporting information 1-3	**Supporting information 2-3**	**Supporting information 3-3**
There are no carriers without symptoms	Finding people who have been exposed and vaccinating them has proved successful in the past	Adequate vaccine in on-hand
*Note: Keywords are in italics		

Figure 2. Draft smallpox message map.

develop messages in advance for emergencies and crises. Once developed, the effectiveness of message maps can be tested through focus groups and other empirical studies.

Message maps were developed by the author in the early 1990s as a specialized tool for communicating effectively in high-stress, high-concern, or emotionally charged situations. Message mapping was first adopted as a public health tool in the aftermath of the anthrax attacks of the fall of 2001.[11-13] For example, early in 2002 message mapping sessions were held which focused on the communication challenges posed by a potential smallpox attack. The product of this workshop was several hundred smallpox message maps. Figure 2 provides one example.

Since 2002, public health agencies at the national, regional, state, and local level have conducted dozens of message mapping workshops. Emergency events that have already been mapped include the release of anthrax, smallpox, plague, and botulism; viral hemorrhagic fevers (e.g., ebola); contamination from a radiation dispersal device; and pandemic influenza. Several important outcomes have resulted from these mapping efforts. These include identification of key stakeholders early in the risk communication process; anticipation of stakeholder questions and concerns before they are raised; internal and external partnering in the development of messages; and a vetted central repository or shelf kit of clear, concise, and accurate information for major types of emergency events.

The process used to generate message maps can be as important as the end product. Message mapping exercises—involving teams of scientists, communication specialists, and individuals with policy expertise—often reveal a diversity of viewpoints for the same question, issue, or concern. Gaps in message maps often provide early warnings that a message is incomplete. In doing such, they provide opportunities for focused efforts by scientists and issue management teams to fill the gaps. Message mapping exercises also frequently identify needed changes in organizational strategies and policies.

Table 1. Seven steps involved in constructing a message map
1. Identify stakeholders for a specified emergency or disaster event
2. Identify stakeholder question and concerns
3. Identify common sets of concerns
4. Develop key messages
5. Develop supporting information
6. Conduct testing
7. Plan for delivery

STEPS IN DEVELOPING A MESSAGE MAP

Seven steps are involved in constructing a message map (Table 1).

Each step is described below.

The first step in message mapping is to identify stakeholders for a specified emergency or disaster event. Stakeholders include the public at large as well as all interested, affected, or influential parties. Every emergency involves a different set of stakeholders. Each stakeholder has a distinctive set of questions and concerns that may be voiced. Table 2 provides a list of potential stakeholders for a public health emergency.

As part of this first step of message mapping, stakeholders can be further distinguished according to: 1) their potential to affect outcomes; 2) their credibility with other stakeholders; and 3) whether they are apathetic, neutral, supportive, nonsupportive, critical, adversarial, or ambivalent regarding issues on the table.[3,14]

The second step in message mapping is to identify a complete list of questions and concerns for each important stakeholder group.[3,5,7,15] Questions and concerns typically fall into three categories:

1. **Overarching questions**, such as, "What do people need to know?";

2. **Informational questions**, such as, "What is the budget for your response? What are the symptoms of the disease? How contagious is the disease?; and

3. **Challenging questions**, for example, "Why should we trust what you are telling us? How many people have to die before you take more aggressive action? Can you guarantee people are safe? What are you not telling us?"

Lists of specific stakeholder questions and concerns can be generated through empirical research, including:

- media content analysis (print, radio, television);
- analysis of Web site material;
- document review, including public meeting records, public hearing records, and legislative transcripts;
- reviews of complaint logs, hotline logs, toll-free number logs, and media logs;
- focused interviews with experts;
- facilitated workshops or discussion sessions with individuals intimately familiar with the issues;

Table 2. Potential stakeholders (interested or affected parties) for a public health emergency	
Victims	Racial populations
Victims' families	Minority populations
Emergency response personnel	Institutionalized populations
Public health officials (local, county, state, national, international)	Elderly populations
Physicians, nurses, paramedics, and other healthcare personnel	Religious groups
Veterinarians	Special language groups
Fire department personnel	Disabled populations
Police and other law enforcement personnel	Homeless people
Hospice personnel	Home-bound populations
Health agency employees	Illiterate populations
Families of emergency responders, law enforcement personnel, hospital personnel, and health agency employees	Tourists or business travelers and their relatives
Government agencies (regulatory and nonregulatory) at all levels	Local residents that are out of town and their relatives
Employees of other responding organizations	Security personnel
Politicians/legislators/elected officials	Service and maintenance personnel
Union officials and labor advocates	Advisory panels
The media (print and electric)	Nongovernment organizations (NGOs)
Legal professionals	Educational leaders and community (all levels)
Contractors	Scientific leaders and community
Consultants	Business leaders and community
Suppliers/vendors	Military leaders
Ethnic populations	Professional societies

- focus groups; and
- surveys.

Public health agencies at the federal, state, and local level have used these techniques to generate lists of questions and concerns for a wide variety of public health issues. For example, Table 3 lists questions and concerns related to outbreaks of disease, be they natural or intentional.[7] These questions could be further refined by grouping them according to themes (for example, clinical traits, epidemiological traits, accountability, blame, vulnerable groups, and protective actions).

Recent empirical research conducted by the Center for Risk Communication and other groups indicates a large percentage of the questions and concerns raised by stakeholders in emergency situations can be identified in advance using these techniques. For example, Table 4 lists the 77 most frequently

Table 3. Questions and concerns related to a disease outbreak
How contagious is the disease?
Can people be vaccinated? Will antibiotics and antiviral medicines work? How effective is vaccination, antibiotic treatment, or antiviral medicine for those with the disease? How effective is vaccination, antibiotic treatment, or antiviral medicine for those who do not have the disease? How fast do the vaccines or antibiotics work?
What are the signs and symptoms of the disease?
Who's in charge of the disease-control effort? How are you coordinating the efforts among responsible agencies?
Is the outbreak due to terrorism? Has the disease been "weaponized?" How certain are you it is not a deliberate release? What if the disease is a genetically altered strain that is resistant to any known medical treatment?
What makes you think the disease-control strategies of the past will work today?
What's being done to stop the spread of the disease?
What kind of medical care is available to the population at risk? Are there enough medical care facilities? What happens if these care facilities are overwhelmed by demand?
What resources are being used to respond to the disease outbreak?
Can the disease be treated? How effective is treatment? Are there strains of the disease that cannot be treated?
How does one know if the vaccination, antibiotics, or antiviral medicines are working?
Are laboratories able to quickly diagnose the disease? How long does confirmation take?
Is the disease airborne? Waterborne?
Can people get the disease from insects, pets, farm animals, or wild animals?
What are authorities in nonaffected areas doing to prepare for an outbreak?
How is the vaccine made? How are the antibiotics and antiviral medicines made? Are there enough vaccines, antibiotics, or antiviral medicines for everyone who wants them? Who will pay for vaccines, antibiotics, or antiviral medicines?
How will vaccines, antibiotics, and antiviral medicines be distributed? How much time will be needed? Where can people can vaccinated, get antibiotics, or get antiviral medicines? If there is a shortage, who will get priority? Who will make these decisions?
What should people do if they think they have the disease?
Do you recommend people get vaccinated, take antibiotics, or take antiviral medicines now? How long does protection last?
Are the vaccines, antibiotics, or antiviral medicines licensed and approved? What is the expiration date? Should people be concerned?
Are the vaccines, antibiotics, or antiviral medicines safe? How do you know? What studies have been done to demonstrate their safety?
Who should not get vaccinated, should not take antibiotics, or should not take antiviral medicines? What can these people do to protect themselves?
Who will tell people when to be vaccinated, take antibiotics, or take antiviral medicine?
Is there an adequate supply of medicines available to treat complications from getting the vaccine, from taking antibiotics, or from taking antiviral medicine?

Table 3. Questions and concerns related to a disease outbreak (continued)
What are the alternatives to vaccination, antibiotics, or antiviral medicine?
How safe are people who get vaccinated, take antibiotics, or take antiviral medicine?
Do you have a contingency plan if current control measures fail?
What does the contingency plan say? What is the worst-case scenario?
Who developed and approved the plan?
What is the risk to the population? How many could die?
How prepared were you for the disease outbreak?
How do you know whether the outbreak is real? Could it be a false alarm?
If people get sick from the vaccination, from taking antibiotics, or from taking antiviral medicine, who will care for their families, pets, homes, and property?
How common are side effects from vaccinations, antibiotics, or antiviral medicine? What are the risks of each side effect occurring?
Can pets and farm animals be vaccinated, take antibiotics, or take antiviral medicine?
Can people with HIV/AIDS, transplants, cancer, and other causes of weakened immune systems be treated?
Can elderly persons and children be treated? Can pregnant women be treated?
What are you recommending for your own family?
How long does it take for the vaccination, antibiotics, or antiviral medicine to protect people against the disease?
Are there people who will not be protected even after getting vaccinated, taking antibiotics, or taking antiviral medicine? How many people are in this category? What are their options?
How can people keep the disease from spreading to others?
Will people be forced to be vaccinated, take antibiotics, or take antiviral medicine?
Will infected people be isolated or quarantined?
How long will quarantine and isolation last?
What are the legal bases for quarantine and isolation?
How effective are quarantine and isolation for preventing spread of the disease?
How will bills be paid while people are in quarantine or isolation?
How will people get healthcare, water, food, and other services while in quarantine or isolation?
Where will people in quarantine or isolation be put?

Table 3. Questions and concerns related to a disease outbreak (continued)
Will people in quarantine or isolation be isolated from each other?
Under what circumstances will people be put in quarantine or isolation?
What are the legal rights of a person who is quarantined or isolated?
Are there alternatives to quarantine and isolation?
How is quarantine/isolation done?
What is life like in quarantine or isolation?
Under what circumstances would a large-scale quarantine or isolation effort be started?
If someone becomes sick in quarantine or isolation, who will care for him? How good will the medical care be?
Will people in quarantine or isolation be able to communicate with family and friends?
Will a person's job be protected while in quarantine or isolation?
What happens to people who refuse to be quarantined or isolated?
Can people get sick when in quarantine or isolation?
What happens if someone dies in quarantine or isolation?
What happens to facilities after they are used for quarantine or isolation?
Can people bring their pets/family/friends into a quarantine or isolation facility?
Can a community refuse to have a quarantine or isolation facility located nearby?
How will quarantine and isolation affect community life, including transportation?
Are there differences of opinion among experts about the need for and effectiveness of quarantine or isolation procedures?
After release from quarantine/isolation, will people be able to go back to work?
What are the personal, family, and job consequences for people in quarantine/isolation?
In quarantine/isolation, will special provisions be made for cultural, religious, and ethnic beliefs/values?
Who will pay the costs for quarantine or isolation?
Who will pay the costs for lost wages of people in quarantine or isolation?

asked questions by journalists during an emergency or disaster. This list was generated from a large database of questions posed by journalists at news conferences immediately following public health emergencies and disasters, including Hurricane Katrina.

The third step in message map construction is to analyze the lists of specific concerns to identify common sets of concerns or categories of concern. Case studies indicate most high-concern issues are associated with no more than 25 categories of concern. Table 5 provides a sample list of categories of concern for a public health emergency or disaster.

Once specific concerns are listed and analyzed, a useful next step is to construct a matrix that contains a list of stakeholders on one axis and a list of stakeholder questions and concerns on the other axis (Figure 3).

Within the boxes of the matrix, stakeholder questions and concerns can be designated as high concern, medium concern, low concern, or not applicable. One of the most important uses of the resulting matrix is as a resource allocation guide. For example, boxes that have the highest numbers of entries should be the first addressed.

The fourth step in message mapping is to develop key messages in response to each stakeholder question or concern. Key messages should be based on what the target audience most needs to know or most wants to know. Key messages are usually developed through brainstorming sessions with a message mapping team. The message mapping team typically consists of a subject matter expert, a communication specialist, a policy/legal/management expert, and a facilitator. The brainstorming session produces message narratives—usually in the form of complete sentences—which are entered as key messages onto the message map. The session can be used to produce key words as a memory aid for the fully scripted message. These key words are then entered onto the message map. Key words are generally more easily accessed and recalled by spokespersons than narratives and scripts. Most people have difficulty memorizing or delivering scripts; however, they can deliver agreed-upon key words using their own words to form whole sentences. Each box in the message map should have no more than three keywords.

The most important message map is the overarching message map—the map that contains and displays the organization's core messages. The overarching message map addresses what you most want people to know about the issue or topic and what you would put in your opening statement at a presentation or news conference relating to the issue or topic. It is crucial that the overarching message map be delivered to the intended audience. One technique for assuring delivery is "bridging." An example of a bridging statement is, "I want to remind you again that . . ." or "What is important for people to know is . . . ." The overarching message map can also serve as "a port in a storm," especially when questioning by journalists or others becomes intense or aggressive.

Construction of the overarching message map, as well as other maps, should be guided by the theories and principles of risk and crisis communication.[1-7,16-19] For example, mental noise theory—one of the main constructs of risk and crisis communication—indicates that when people are upset they often have difficulty hearing, understanding, and remembering information. Mental noise can reduce a person's ability to process information by more than 80 percent.[20] The challenges for risk and crisis communicators, therefore, are to 1) overcome the barriers mental noise creates, 2) produce accurate messages for diverse audiences in diverse social and cultural contexts,[21] and 3) achieve maximum communication effectiveness within the constraints posed by mental noise.

Professional risk and crisis communicators use a variety of means to overcome mental noise.[5,7,16,17] For example, they limit the number of key messages offered to three. They limit the amount of time and words used to express their three key messages to no more than nine seconds and 27 words. They construct messages that are clearly understandable by the target audience. For example, message maps produced by public health agencies in industrialized nations are typically constructed to be easily understood by an adult with a sixth- to eighth-grade education. This can be tested using the readability utility contained in word-processing programs. Additional tactics include:

- Adhere to the "primacy/recency" or

Table 4. The 77 most frequently asked questions by journalists in an emergency or disaster
1. What is your name and title?
2. What are your job responsibilities?
3. What are your qualifications?
4. Can you tell us what happened?
5. When did it happen?
6. Where did it happen?
7. Who was harmed?
8. How many people were harmed?
9. Are those that were harmed getting help?
10. How certain are you about this information?
11. How are those who were harmed getting help?
12. Is the situation under control?
13. How certain are you the situation is under control?
14. Is there any immediate danger?
15. What is being done in response to what happened?
16. Who is in charge?
17. What can we expect next?
18. What are you advising people to do? What can people do to protect themselves and their families—now and in the future—from harm?
19. How long will it be before the situation returns to normal?
20. What help has been requested or offered from others?
21. What responses have you received?
22. Can you be specific about the types of harm that occurred?
23. What are the names of those who were harmed?
24. Can we talk to them?
25. How much damage occurred?
26. What other damage may have occurred?
27. How certain are you about damages?
28. How much damage do you expect?
29. What are you doing now?

Table 4. The 77 most frequently asked questions by journalists in an emergency or disaster (continued)
30. Who else is involved in the response?
31. Why did this happen?
32. What was the cause?
33. Did you have any forewarning this might happen?
34. Why wasn't this prevented from happening? Could this have been avoided?
35. How could this have been avoided?
36. What else can go wrong?
37. If you are not sure of the cause, what is your best guess?
38. Who caused this to happen?
39. Who is to blame?
40. Do you think those involved handled the situation well enough? What more could/should those who handled the situation have done?
41. When did your response to this begin?
42. When were you notified something had happened?
43. Did you and other organizations disclose information promptly? Have you and other organizations been transparent?
44. Who is conducting the investigation? Will the outcome be reported to the public?
45. What are you going to do after the investigation?
46. What have you found out so far?
47. Why was more not done to prevent this from happening?
48. What is your personal opinion?
49. What are you telling your own family?
50. Are all those involved in agreement?
51. Are people overreacting?
52. Which laws are applicable?
53. Has anyone broken the law?
54. How certain are you about whether laws have been broken?
55. Has anyone made mistakes?
56. How certain are you mistakes have not been made?
57. Have you told us everything you know?
58. What are you not telling us?

Table 4. The 77 most frequently asked questions by journalists in an emergency or disaster (continued)
59. What effects will this have on the people involved?
60. What precautionary measures were taken?
61. Do you accept responsibility for what happened?
62. Has this ever happened before?
63. Can this happen elsewhere?
64. What is the worst-case scenario?
65. What lessons were learned?
66. Were those lessons implemented? Are they being implemented now?
67. What can be done now to prevent this from happening again? What steps need to be taken to avoid a similar event?
68. What would you like to say to those who have been harmed and to their families?
69. Is there any continuing danger?
70. Are people out of danger? Are people safe? Will there be inconvenience to employees or to the public?
71. How much will all this cost?
72. Are you able and willing to pay the costs?
73. Who else will pay the costs?
74. When will we find out more?
75. Have these steps already been taken? If not, why not?
76. Why should we trust you?
77. What does this all mean?

"first/last" principle. This principle states that the most important messages should occupy the first and last position in a list.[20] In high-stress situations, listeners tend to focus most on, and remember, whatever they hear first and last. Messages that are in the middle of a list are often not heard. Focus-group testing demonstrates that people often cannot recall middle messages.

- Cite third parties or sources that would be perceived as credible by the receiving audience. The greater the extent to which messages are supported and corroborated by credible third-party sources, the greater the trust and the less likely it is mental noise will interfere with the ability to comprehend messages.[20]

- Develop key messages and support information that addresses important risk-perception and outrage factors, such as trust, benefits, control, voluntariness, dread, fairness, reversibility, catastrophic potential, effects on children, morality, origin, and familiarity.[3,22-24] The list of risk-perception factors found in Table 6 contains those causing the highest levels of worry, anxiety, and mental noise. Research indicates the greater the extent

Table 5. Sample categories of concern for emergencies and disasters
Health
Safety
Ecological/environmental
Economic
Quality of life
Equity/fairness
Cultural/symbolic/stigma
Legal/regulatory
Organizational (for example, who's in charge)
Basic informational—who, what, where, when, why, how
Openness/transparency/access to information
Accountability
Options/alternatives
Control
Effects on children/future generations
Irreversibility
Ethics/morality
Unfamiliarity
Changes in the status quo
Volunteering of information
Benefits
Expertise
Honesty
Listening/caring/empathy
Responsiveness
Trust

to which risk-perception factors are addressed in messaging, the less likely it is mental noise will interfere with the ability to comprehend messages.[20]

- Provide a preamble to the message map that indicates authentic empathy, listening, caring, and compassion, which are crucial factors in establishing trust in high-concern, high-stress situations.[9,20,25] People typically want to know that you care before they care what you know. The greater the extent to which individuals and organizations are perceived to be empathic, caring, listening, and compassionate, the less likely it is that anxiety and stress will interfere with the ability to comprehend messages.

- Use graphics, visual aids, analogies, and narratives (e.g., personal stories). These methods can increase an individual's ability to hear, understand, and recall a message by more than 50 percent.

- Construct messages recognizing the high levels of anxiety and exaggerated fears often associated with the dominant role played by negatives in high-concern situations.[20] According to negative dominance theory (asymmetry theory), people tend to focus more on the negative than on the positive in emotionally charged situations. Two potential solutions to this include: 1) balancing negative key messages with positive, constructive, or solution-oriented key messages, employing a ratio of at least three positive messages for each negative message; and 2) avoiding unnecessary, indefensible, or nonproductive uses of absolutes and of the words "no," "not," "never," "nothing," and "none."

- Present the full message map using the repetitive structure found in the "tell me,

Table 6. Risk-perception factors
Risks are more worrisome and feared if they are perceived to:
be involuntary or imposed
be inequitably distributed
be inescapable
be under the control of others, especially those we don't trust
arise from an unfamiliar or novel source
result from manmade rather than natural sources
cause hidden and irreversible damage
pose some particular danger to small children, pregnant women, or, more generally, to future generations
threaten a form of death (or illness/injury) that is particularly dreaded
threaten or harm identifiable rather than anonymous or theoretical victims
pose a personal threat by singling you out from others
offer little or no compensating benefits
be new and poorly understood by science
be subject to contradictory statements

tell me more, tell me again," or "Triple T" model: 1) tell people what you are going to tell them in summary form, i.e., the three key messages; 2) tell them more, i.e., the supporting information; and 3) tell people again what you told them in summary form, i.e., repeat the three key messages. The greater the extent to which messages are repeated and heard through various channels, the less likely it is mental noise will interfere with the ability to comprehend messages.

Studies recently conducted by the Center for Risk Communication indicate it is crucial that key messages be concisely stated if they are offered to the news media as sound bites or quotes. Based on an analysis of 10 years of print and media coverage of emergencies and crises in the United States, the studies found:

- the average length of a sound bite in the print media was 27 words;
- the average duration of a sound bite in the broadcast media was nine seconds;
- the average number of messages reported in both the print and broadcast media was three; and

Concerns → / Stakeholders ↓	Human health	Trust	Safety	Environmental	Information	Ethics	Economics	Responsibility	Legal	Process	Pets/livestock	Religious	Fairness	Other
Public-at-large														
Public-at-risk														
Victims														
Victim families														
Emergency response personnel														
Public health personnel														
Physicians/nurses/ veterinarians														
Law enforcement personnel														
Hospital personnel														
Health agency employees														
Other														

Figure 3. Matrix of stakeholders and their concerns.

- quotes most likely to be used as sound bites contained compassion, conviction, and optimism.

Adherence to the 27 words/nine seconds/three messages size limitation, or 27/9/3 template, helps ensure spokespersons are quoted accurately and completely in media interviews.

The fifth step in message map construction is to develop supporting facts, information, or proofs for each key message. The same principles that guide key message construction guide the development of supporting information. Proof points, especially when they are highly complex or technical, do not necessarily need to be included in the message map. They are often attached to the map as an appendix. In addition, proof points are often held in reserve to support a particular message if challenged.

The sixth step in message map construction is to conduct systematic message testing using standardized

message testing procedures. Message testing should begin by asking subject matter experts who are not directly involved in the original message mapping process to validate the accuracy of information contained in the message map. Message testing should then be done with partner organizations and individuals or groups who have the characteristics to serve as surrogates for key internal and external target audiences. Sharing and testing messages with partners ensures message consistency and coordination.

The seventh, and final, step is to plan for the delivery of the prepared message maps through trained spokespersons, trusted individuals or organizations, and appropriate communication channels.

Once developed, message maps can be used to structure press conferences, media interviews, information forums and exchanges, public meetings, Web sites, telephone hotline scripts, and fact sheets or brochures focused on frequently asked questions.

In conclusion, message maps are a viable tool for communicating information about pubic health emergencies and disasters. They ensure risk information has the optimum chance of being heard, understood, and remembered. Message maps allow organizations to convey timely, accurate, clear, and credible information. 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.

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